

https://dspace.org/

Investigating the sustainability of the Housing Programme of Cornubia, with regards to Sustainable Human Settlements

Bodhi, Kavish

2016

UNIVERSITY OF WITWATERSRAND FACULTY OF ENGINEERING & THE BUILT ENVIRONMENT

http://hdl.handle.net/10539/22798

Bodhi, K. (2016) ,Investigating the sustainability of the Housing Programme of Cornubia, with regards to Sustainable Human Settlements, Faculty of Engineering and the Built Environment, University of the Witwatersrand

Downloaded from a DSpace repository. https://dspace.org/

UNIVERSITY OF THE WITWATERSRAND

Investigating the sustainability of the Housing Programme of Cornubia, with regards to Sustainable Human Settlements

By Kavish Bodhi, 560576

A research report submitted to the School of Architecture and Planning, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Bachelor of Science with Honours in Urban and Regional Planning.

09 December 2016

Supervisor: Dr Brian Boshoff

Acknowledgments

My greatest appreciation is extended towards my parents, Anand and Romila Bodhi, who have supported me throughout my education and helping me pursue my dreams.

I would like to thank my supervisor Dr Brian Boshoff for all his guidance and patience that he bestowed upon me while writing this research report.

To all participants involved with this research report, I thank you.

Declaration

I, Kavish Bodhi, declare that this research report is my own work. The research report is submitted to the School of Architecture and Planning, Faculty of Engineering and the Built Environment, of the University of the Witwatersrand in partial fulfilment of the requirements for the degree, Bachelor of Science (Honours) in Urban and Regional Planning, in the year 2016.

_____ Signature

Date: 09 December 2016

Abstract

After the 1994 elections, housing initiatives, aimed to address the inequalities created within Apartheid, such as racial and socio-economic segregation. This resulted in the 1994 White Paper and 1997 Housing Act which encompassed some aspects of the Reconstruction and Development Programme (RDP). However, housing policy implementation was criticised for many reasons. This resulted in emergence of the Breaking New Ground (BNG) policy which aimed at creating sustainable human settlement, as opposed to just housing provision. In the past few years under BNG, government has adopted several programmes that promote the creation of sustainable development, sustainable human settlements and sustainable housing. In order to address this challenge and create sustainable human settlements, the eThekwini municipality envisioned the Cornubia Integrated Human Settlement Project. This is a partnership between the eThekwini municipality and Tongaat Hulett Development. Cornubia proposes a mixed-use development, with retail, commercial, light industry and residential components. The project is still under development, but phase 1a of the housing programme has been completed.

The research draws on aspects and principles of sustainable development, sustainable housing and sustainable human settlements; and how the South African government engages with these principles through policies and strategies. Though the state has taken the initiative to provide housing in Durban through the Cornubia development, it is no longer sufficient to just provide housing to people, as a housing development needs to address more issues than accessing shelter.

Therefore this research report looks at the sustainability practices and initiatives used within Cornubia's Housing Programme. There are many plans and strategies put in place to ensure and promote economic, social and environmental sustainability, however, given that the housing programme is still within its early stages of development, many of these plans have either not fully materialised for have not been put in place due to lack of threshold. This results in the reality of what residents experience which contrasts what is proposed for the development, with regards to sustainability. Residents interviewed stated that they have not benefitted much (if not at all) from any plans and strategies that have supposedly been put in place. Over and above advocating for the full implementation of all plans and strategies put in place to create sustainability within the housing programme, the main recommendation of this research report is to address the title deed contract between residents and the eThekwini Municipality. Residents should be able to edit their house or use their house as collateral in order to improve their lives through creating SMMEs or acquiring loans.

Contents

Acknowledgments **1**

Declaration **2**

Abstract **3**

Chapter 1 - Introduction **6**

Background 7

Understanding the Context of sustainable housing, development and human settlements 8

Rationale for the research 10

Research question and Research sub-questions 11

Overview of Research methodology and methods 12

Chapter Outline 13

Chapter 2 – Literature Review **15**

Introduction 16

Sustainable development 17

Sustainable Human Settlements 23

Sustainable Human Settlements in South Africa 24

Housing and human settlement policies in SA 26

Sustainable Housing 29

South Africa's Housing challenge 30

Cornubia Integrated Human Settlement 31

Concluded Conceptual Framework 34

Chapter 3 – Research Methods and Methodologies **36**

Introduction to the direction of research 37

Research methods in detail 37

Using case studies in research 40

Limitations of Research 40

Conclusion 41

Chapter 4 – Case Study Overview **42**

Introduction 43

Locality 43

EThekwini Municipality's Vision of Cornubia 45

Land ownership 46

Site considerations 46

Housing Programme 47

Development relation to SPLUMA 48
Conclusion 48
Chapter 5 – Findings 50
Introduction 51
Cornubia development context 51
Sustainability of Cornubia's Housing Programme 53
Housing Programme and Development 58
Interview Results 60
Conclusion 64
Chapter 6 – Analysis of Findings 65
Introduction 66
Justifications for Cornubia development 66
Has the implementation of Phase 1a assisted Cornubia in becoming a SHS? 68
Possible Housing Programme outcomes 71
Conclusion 73
Chapter 7 – Conclusion 74
What sustainable housing initiatives have been envisioned for and implemented within Cornubia, specifically the Housing Programme? 77
How can the Housing programme assist Cornubia in becoming a sustainable human settlement? 79
Recommendations 80
Reference List 83
Diagrams 87
Appendix 89
Consent form 89
Participant Information Sheet 90
Interview with Developer 91
Interview with Residents 92

Chapter 1 - Introduction

Background

During the Apartheid era, prior to the 1994 democratic elections, spatial planning in South Africa aimed to create racial and socio-economic segregation within settlement design. But after the 1994 elections, housing policies, like the White Paper on Housing (1994), aimed to address the inequalities created within Apartheid. The aim of this White Paper on Housing was to provide "a framework for the country's housing development target of building one million state-funded houses in the first five years of office" (Tissington, 2011:21). This target was outlined within the Reconstruction and Development Programme (RDP) which was the ANC Alliance's election manifesto. Within response to aspects of the RDP, the National Housing Subsidy Scheme (NHSS) aimed to "provide capital subsidies for housing to qualifying beneficiary households to take full ownership" (Tissington, 2011:21). This later began to be referred to as "RDP housing." The Reconstruction and Development Programme (RDP) aimed at addressing past injustices caused due to apartheid. The essence of the policy was to overcome poverty through creating sustainable livelihoods for all. This idea of addressing past injustices meant that the 1994 White Paper on Housing aimed to create "the provision of secure tenure; permanent residential structures which would ensure privacy; and access to basic services for the poor and homeless" (White Paper, 1994:19). However, what came to be known as the 'RDP housing' approach was highly criticised. For example, there was a lack of appropriate infrastructure, basic services, clinics, schools, green spaces and other amenities within such post-apartheid housing development (Donaldson, 2001). There were other challenges that the programme faced, (over and above the fact that the location of the RDP houses occurred on the periphery of urban areas) such as the low quality in relation to the construction of the houses resulting in some units cracking and leaking, causing people to vacate their houses (Mokgalapa, 2012).

In 2004, Cabinet reviewed the housing performance over the past 10 years. Over and above the criticism, it was found that the "RDP housing" policy put in place did not meet the outlined objectives. Therefore Breaking New Ground (BNG) was created as "a revised framework for the development of sustainable human settlements. BNG is based on the principles contained in the White Paper on Housing and outlines the strategies to be taken to achieve the government's overall housing aim" (Tissington, 2011:21). The BNG policy outlined the plan for the development of sustainable human settlements over the next 5 years.

Though the implementation of the BNG policy aimed at creating sustainable human settlements, the supply of such housing did not meet the demand for housing throughout South Africa. The housing issue in the eThekwini municipality (and in South Africa as a whole), is of paramount concern. Over the past few years, EThekwini Municipality has struggled with the need for sustainable human

settlements. In 2008 Tongaat Hulett Development and the EThekwini Municipality signed a Cooperation and Alignment Agreement which defined the terms of a partnership involving the development of the Northern Corridor along the Durban Coast (Tongaat Hulett Development, 2014:1). The initial development within this corridor was the Cornubia Integrated Human Settlement by Tongaat Hulett Development.

"Tongaat Hulett Development agreed to sell 659 hectares of land to the Municipality for the development of subsidised housing and on the balance of the land, Tongaat Hulett Development is currently developing a range of commercial, industrial and market-related residential uses to support and complement the lower-income housing" (Tongaat Hulett Development, 2014:2).

The holistic development of Cornubia includes retail, commercial, bulk industry and residential components. Cornubia is consider by Durban Municipality as an integrated human settlement because it aims to elevate people from the lower socio-economic levels and job opportunities into the same location through aligning institutional, financial, human and managerial resources (Tongaat Hulett Development, 2014:1). The idea behind Cornubia is to enhance regional competitiveness, investment, economic development and social delivery within Durban and Kwa-Zulu-Natal as a whole. The project aims to create a better life for all by engaging with aspects like urban restructuring and renewal, informal settlement eradication, integration, densification, improved settlement design, better quality shelter, poverty eradication, and greater responsiveness to livelihood (Tongaat Hulett Development, 2014:1). This research report aims to investigate the sustainability of the housing component within Cornubia Integrated Human Settlement, so as to understand what progress has been made thus far in achieving sustainable human settlements.

Understanding the Context of sustainable housing, development and human settlements

There are many different ways in which sustainability can be interpreted as there are connotations and interpretations of this concept. Within this research report sustainability is taken to encompass three broad concepts, viz. economic, social and environmental, and the intertwined relationship between all three concepts. This way of defining sustainability is entrenched within all aspects related to sustainability, such as sustainable housing, sustainable development and sustainable human settlements.

Housing, rights and sustainability

The idea of shelter can be seen as one of the most important basic needs. The Constitution of South Africa, states that "everyone has the right to have access to adequate housing" (SA Constitution,

1996:7). But as stated previously, it is no longer sufficient to just provide a house for a person. In South Africa, one of the biggest problems is the housing crisis whereby the demand for houses exceeds the supply. But over and above the housing crisis, "South Africa battles to adapt and utilize efficient technological solutions to truly decrease environmental impacts, improve and supply necessary services, create access to jobs, and at the same time provide comfort for residents" (Sustainability Institute, 2009:1). There is a need to define solutions that best suit our climate, culture, ecosystems and social context within a housing provision context.

The Housing Challenge

According to Morare (2014), the University of Johannesburg Social Change Research Unit and the Multi-Level Government Initiative's 'Service Delivery Protest Barometer' found that the past 10 years, have "seen a serious rise in service delivery protests, from 13 in 2004 to a peak of 470 in 2012, before falling to 287 in 2013;" and from this, the most-cited grievances revolve around land and housing (Morare, 2014:1). Along with the protests, other research done regarding the Service Delivery Protest Barometer showed a recurring pattern of land invasions and evictions.

Though the housing problem in South Africa can be regarded as a crisis, it can be argued that it is more of a challenge than a crisis. Over the past 20 years, the progress of housing delivery by government cannot be ignored or disregarded, as there has been a steady supply of housing. However, demand for housing is ever increasing at a pace which outweighs such housing supply. Over and above housing supply and demand, one of the biggest issues South Africa faces in regards to settlement development is that of sustainable resource use, which will be further discussed in Chapter 2 of this research report.

Sustainable Human Settlements

The idea of creating sustainable human settlements should entail a plan which defines not only "short-term physical and economic objectives, but long-term social, environmental and economic development goals" (Sustainability Institute, 2009:2). As stated previously, the BNG policy outlined the process of creating sustainable human settlements within South Africa. There is a shift in focus from redress and redistribution of housing, to looking at housing as a key element to promote densification and integration and enhance spatial planning. But the sustainable design principles and guidelines of creating sustainability within human settlements is quite a new concept for South Africa, as there are a few examples that demonstrate successful implementation of such principles and guidelines.

According to Sustainability Institute (2009) in South Africa, the types of Human Settlements include:

- Upgrading of informal settlements
- Formalisation of informal settlements
- Greenfield development
- Turnkey projects
- Community builder programme
- Prototype programme
- Social housing
- Upgrading hostels
- Transforming the city's dormitory townships

Within this Research Report, emphasis will be placed upon Greenfield development and Prototype programme as attributes of both types of sustainable human settlements relate to the case study of Cornubia Integrated Human Settlement.

Cornubia

Cornubia Integrated Human Settlement is a new mixed-use development that is situated in Durban, Kwa-Zulu-Natal. Cornubia has aimed at the creation of a sustainable human settlement. Cornubia is the first proposed sustainable and fully integrated human settlement within Durban. It is situated within the north corridor of Durban's commercial hub.

The total site of development is adjacent to Umhlanga in the east, Mount Edgecombe in the south, Ottawa in the west and Waterloo in the north, bordered by N2 freeway and M41 arterial and the Ohlanga River, 7 km south of the new King Shaka International Airport. The project is under construction and proposes 10000 middle income units; 15000 subsidized units and 2.5 million m^2 bulk commercial/industrial development along with social facilities, schools etc. In 2014, the first phase of the housing project was completed, whereby there were approximately 482 developed residential units situated in Mt Edgecombe on the Northern Corridor of Durban (COGTA 2014).

The housing component of the project follows the principles of the BNG policy and is ultimately aimed at "promoting the achievement of non-racial, integrated society through the development of sustainable, integrated human settlement and quality housing" (BNG, 2004:7). The Cornubia project area has a potential yield of 25 000 residential units within 7 phases.

Rationale for the research

Housing is one of the most influential and essential components of human settlement. The reason for this is that housing encompasses the basic needs for a person, through which it affects their

quality of life, welfare and health. Unfortunately, many people in developing countries do not have access to proper housing, as such, the challenge of providing affordable housing is of major concern (Ibem and Amole, 2010:88). The intervention of government and private sector with regards to dealing with economic and social challenges caused by lack of housing provision has been incessant, through strategies, legislation, reforms, and policies that have led to a variety of housing programmes (Ibem and Amole, 2010:89).

Housing provision in South Africa is ever challenging, due to the Apartheid regime and its policies which promoted inequality and segregation amongst non-whites, which adversely affected the living conditions of those who were disadvantaged (Goodlad, 1996:1631). This segregation of whites and non-whites had implications not only in terms of race, but resulted in divisions of economic and social urban spaces (Gardner, 2003:5). In order to overcome such divisions, the simple provision of housing was not enough as it does not benefit all aspects of people's lives, especially the poor. This was clearly seen with 'RDP housing', which many people criticised for the quality of the houses, as well as the fact that most RDP housing occurred on the periphery of urban areas, resulting in many people residing in such houses paying a lot for transportation to access economic opportunities. Therefore, South Africa has moved towards creating sustainable human settlements so as to provide infrastructure, basic services, clinics, schools, green spaces and other amenities to housing developments – as proposed within the BNG policy. Unfortunately, even to this day, South Africa is suffering from a housing challenge. But this challenge does not merely incorporate the high demand and low supply of housing, but rather the lack of sustainable human settlements (SA's housing challenge will be further discussed in Chapter 2). The rationale behind my research is to understand what is considered as sustainable development, sustainable housing and sustainable human settlements. The level of sustainability and its associated practices and performance will indicate if a development truly embodies the characteristics of a sustainable human settlement. Ultimately, the aim of my research is to investigate how sustainable the housing component is within Cornubia and to assess the extent of the development in creating a sustainable human settlement that Durban desperately needs.

Research question and Research sub-questions

Though the eThekwini municipality deems Cornubia as being an Integrated Human Settlement, I want to investigate Cornubia's housing programme with regard to sustainable housing and sustainable human settlements specifically. However, before one can begin to investigate the sustainability of the housing programme in relation to sustainable human settlements, it must be noted that Cornubia is within the early stages of development. As it stands, there are plans in place for certain facilities and strategies to be implemented. However, a conclusion of the level of

sustainability of the whole development cannot be assumed or generalised given the first phase of the housing programme. But the research aims to understand the context of the housing programme, in relation to sustainability, given the completed Phase 1a housing and the projected development of the future housing phases of Cornubia. Therefore, my research question is:

How sustainable is the Housing Programme of Cornubia, with regards to creating Sustainable Housing and Sustainable Human Settlements?

The research focuses on the housing aspect specifically with regards to the holistic development, because a portion of the residential area is complete, with the bulk of the residential area near completion over the next few years, whereas the industry and commercial aspect is still under construction. The aim of Cornubia is to create a "diverse, mix of land uses, as well as a key focus on the public realm and a concerted effort is placed on creating better environments through the concepts of walkability, convenience, connectivity, increased density and sustainability" (Iyer Design Studio, 2013:8).

In order to help answer my research question, my sub-questions are:

1. *How should sustainability be understood in relation to sustainable human settlements?*
2. *What sustainable housing initiatives have been envisioned for Cornubia?*
3. *Of these initiatives, what has and has not been implemented within the development?*
4. *How can the Housing programme assist Cornubia in becoming a sustainable human settlement?*

Overview of Research methodology and methods

The focus is placed upon the understanding of sustainability and the importance of understanding the complexity of sustainable human settlements. The research encompasses qualitative methods whereby an exploratory analysis is undertaken to understand the practices and performance of the housing development in Cornubia. The extent of sustainable practices is explored so as to identify the subsequent outcomes of the development. The research undertakes an overview of the development and introduction to the research study in Chapter 1; followed by a literature review which analyses research done in regards to sustainable development, housing and human settlements, as well as information associated with Cornubia in Chapter 2. Research methods are thereafter detailed in Chapter 3; which leads to the case study analysis in Chapter 4. Interviews were also used to obtain qualitative data. Such interviews were conducted with residents, officials and property developers of Cornubia. The interviews conducted with these individuals are of paramount importance as they are directly involved with the development and its subsequent outcomes. The

rudimentary use of such methods is to understand what is actually happening within Cornubia in regards to sustainable human settlements.

Ethical Considerations

My research does not deal with extremely sensitive issues, and does not involve vulnerable groups. I have interviewed residents of the development and those with positions of authority. I have created respondent anonymity so as to be careful not to alter reality through my research and affect their character or status. An ethics application was submitted and it ensured that there were no issues I may have overlooked. The application was successful. Respondents were asked whether or not they would like to be anonymous in the report, by signing a consent form.

Chapter Outline

Chapter 1 – Introduction

This chapter introduces the context, rationale for research, as well as research question and sub-question. It also highlights the research methodology and methods used to answer such questions.

Chapter 2 – Literature Review

This chapter involves reviewing literature done surrounding sustainability, specifically sustainable development, sustainable human settlements and sustainable housing. It also investigates research surrounding Cornubia integrated human settlement and sustainable human settlements in South Africa. From this, a concluding conceptual framework has been defined, that informs the interview directions and questions.

Chapter 3 – Research Methodology and methods

This chapter defines the strengths and weaknesses surrounding the use of a case study as a research tool. It also describes the methods in detail and indicates how the conceptual framework informed the interviews.

Chapter 4 – Case Study overview

This chapter describes Cornubia in regard to location and other data so as to paint a portrait of the housing development in question.

Chapter 5 – Findings

All information retrieved during fieldwork is combined within this chapter. The chapter is structured into the following sections: Introduction to findings; Cornubia development context; human settlement sustainability; housing programme and development; interview results; and concluding remarks on findings. In some cases within the above sections, key points are elaborated upon through secondary research so as to deepen my understanding of such points.

Chapter 6 – Analysis of findings

This chapter analyses the findings per the fieldwork. It defines the aspects of what sustainable housing initiatives/principles that have been implemented against what initiatives/principles are needed for a development to be considered sustainable, both in regards to sustainable housing and sustainable human settlements.

Chapter 7 – Conclusions

The purpose of this chapter is to answer my research question, defining what constitutes as sustainability within housing and human settlements, and the current context of Cornubia's housing development. The chapter concludes by defining what can be done to promote and implement sustainability within housing and human settlements in a South African context.

Chapter 2 – Literature Review

Introduction

Within the 22 years since South Africa became a democratic country, government has tried relentlessly to provide housing for those who were negatively affected by the Apartheid government due to segregation and racial policies at the time. The apartheid practices resulted in a highly fragmented city, which was characterized by low density urban sprawl, and racially divided urban growth patterns (Donaldson, 2001). With regards to urban sprawl, Dewar (2000) highlighted the fact that compaction is essential for South Africa to deal with its major environmental and social problems. Dewar (2000) also goes on further to state that "compaction is essential to South African cities and this compaction should be achieved through directed residential infill which will add to positive structural change" (Dewar, 2000:209).

The 1994 White Paper on Housing is seen as the principal, overarching national housing policy, while the 2004 Breaking New Ground was "the first major policy amendment/refinement to the White Paper on Housing since 1994" (Tissington, 2011:21). The idea of the BNG was to achieve sustainable livelihoods for all, through creating sustainable human settlements. In this way, the BNG policy adopted principles and parameters for creating sustainable human settlements, as opposed to just providing housing. Such principles were also adopted by the Growth, Employment and Redistribution Strategy (GEAR) and Outcome 8. GEAR succeeded the RDP programme and identified key development challenges that needed to be addressed "through housing and economic growth with employment and economic empowerment" (Irurah and Boshoff, 2003:257). Outcome 8 is an approach launched by the President in 2010 with clear targets. This approach was in regard to creating sustainable human settlements through accelerated delivery of housing opportunities; access to basic services; more efficient land utilisation; and an improved property market (Bassa, 2015). Donaldson (2001) highlighted the fact that people want to live in places that offer a better quality of life, access to jobs and job opportunities. Such a space needs to be safe and secure, as well as, having access to key infrastructure (water, electricity, health care, education and entertainment), as opposed to housing provision only. In this way, development of housing should occur within sustainable human settlements.

With regard to the need for sustainable human settlements, Durban has struggled in this regard especially with informal settlements, whereby in 2011, a census revealed 635 informal settlements across Kwa-Zulu-Natal (KZN), with 494 of these being in the eThekwini region (Mbanjwa, 2013). Unfortunately RDP housing developments in KZN, such as Mitula, fell into the same trap of merely providing housing, with little thought given to community building, access to economic opportunities and ultimately creating a better life for all. Therefore the vision of the Cornubia Integrated Human Settlement was "to create a better life for all by engaging with aspects like urban restructuring and

renewal, informal settlement eradication, integration, densification, improved settlement design, better quality shelter, poverty eradication, and greater responsiveness to livelihood" (Tongaat Hulett Development, 2014:1).

The research will explore what constitutes sustainable development. From this, analysis of what constitutes as sustainable human settlements and sustainable housing will be discussed. This will help inform how the South African government has defined what constitutes a sustainable human settlement. Ultimately, the research will highlight the Cornubia development and how it aims to be a sustainable human settlement within Durban. The research will also look at housing policies such as the 1994 White Paper on housing, 1997 Housing Act, 2000 National Housing Code, and 2004 Breaking New Ground Policy

Sustainable development

The concept of sustainability, within the built environment, took precedent since the 1990's (Irurah and Boshoff, 2003). The need for sustainable development came into play within urban environments which, "until the late 1900s, governments and communities had committed themselves to a vision of improved standards of living through increasing the GDP of their respective economies, while paying minimal attention to environmental and resource impacts" (Irurah and Boshoff, 2003:244). This resulted in the realisation of resource and environmental degradation, in the 1950s to 1970s, due to increased growth of population and increasing levels of production and consumption (ibid). In this way, sustainable development can be characterised as "developments that meet the needs of the present residents without compromising the needs of future generations" (WCED, 1987:43). Sustainable development can be seen as "the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves the present and future generations" (NEMA, 1998:10). There are many aspects to what is sustainable development but sustainable development can be seen as a dynamic concept that evolves over time. The evolution of the meaning of sustainable development can be related to the sustainable development paradigm. Irurah and Boshoff (2003) stated that the emergence of the sustainable development paradigm from the 1990s has indicated the evolution of the re-definition and understanding of sustainable development. This can be seen when "characterising and contrasting cities through concepts and debates such as compact versus sprawl, ecological versus non-ecological and just versus unjust cities" (Irurah and Boshoff, 2003:260).

In order to achieve Sustainable Development, researchers have found that there needs to be an amalgamation of 3 components, viz. the economy, environment and social, and the trade-offs

between each of them. The reason for this, is that one cannot just focus on the environmental (or any other) component of housing and deem a development as sustainable. All three have to work hand in hand in order to be considered a sustainable development, (as depicted in diagram 1).

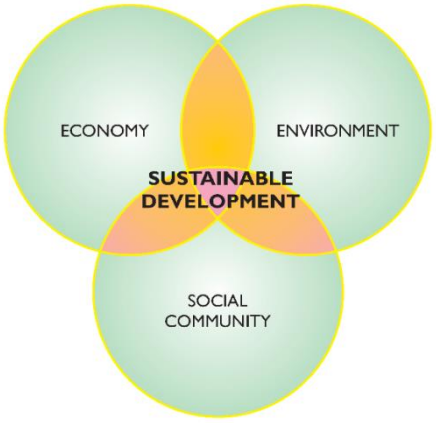


Diagram 1: 3 Components that define Sustainable Development (http://www.7continents5oceans.com/wp-content/uploads/2015/05/Sustainable-Development-2.png)

To elaborate further, the Nelson Mandela Bay Municipality (2007) defines the three aspects of sustainability whereby:

1. Environmental sustainability can be seen as the protection and conservation of non-renewable natural resources through:

    - Ensuring sufficient open spaces
    - Limiting pollution
    - Protecting sensitive environments
    - Ecological construction methods
    - Use of renewable energy sources such as solar or wind power
    - Protecting agricultural land
    - Ecological sanitation systems
    - Recycling and minimisation of solid waste

    (Nelson Mandela Bay Municipality, 2007:19)

2. Social sustainability can be seen as meeting the basic social needs of all communities, through providing and making sure of:

    - Diversity in communities
    - Democracy and participation in planning processes
    - Community participation in planning and development

- Creating democratic institutions,
- Gender sensitivity and equality,
- Transparent and fair planning and allocation processes and,
- Prioritizing the needs of the poor and disadvantaged groups

(Nelson Mandela Bay Municipality, 2007:19)

3. Economic sustainability can be seen as creating "employment and livelihood opportunities in a community as well as economic growth and increasing general and individual prosperity" (Nelson Mandela Bay Municipality, 2007:19). This can be achieved through:

    - Adequate access to education at all levels,
    - Redistribution of wealth via subsidies and social grants,
    - Ownership of assets,
    - Affordability,
    - Creation of work opportunities via public programmes,
    - Financial and technical support to businesses and,
    - By encouraging local production, trading and service provision.

    (Nelson Mandela Bay Municipality, 2007:19)

However, it must be noted that sustainability is not limited to the three aforementioned components. For example, Godschalk (2004) highlighted the importance of promoting sustainable development at a micro-economic level, with regards to creating a sense of 'place' through the concept of liveability. The concept of liveability accounts for socio-economic and environment, in order to create a sense of 'place', and as such encompasses sustainable development. The concept of liability encompasses sustainable development principles, public space, building design, and movement systems, which ultimately creates a sense of 'place'.

Sustainable Development in South Africa

In South Africa, the definition of sustainable development was formalised in law through the National Environmental Management Act (NEMA) in 1998. Section 1(29) of NEMA states that sustainable development is defined as the "integration of social, economic and environmental factors into the planning, implementation and decision-making process so as to ensure that development serves present and future generations" (NEMA, 1998:10).

From this, NEMA (1998) states that Sustainable Development requires:

- The disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- The disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
- Waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;
- A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and
- Negative impacts on the environment and on people's environmental rights be anticipated; and, prevented and where they cannot altogether be prevented, are minimised and remedied.

(NEMA, 1998:10-12)

Thereafter, in 2008, building on this definition and requirements of sustainable development, the Department of Environmental Affairs (DoEA) defined a National Framework on Sustainable Development. The framework is seen as a national strategy for Sustainable Development. The vision of this framework with regards to creating a sustainable society is that:

"*South Africa aspires to be a sustainable, economically prosperous and self-reliant nation that safeguards its democracy by meeting the fundamental human needs of its people, by managing its limited ecological resources responsibly for current and future generations, and by advancing efficient and effective integrated planning and governance through national, regional and global collaboration*" (DoEA, 2008:8).

In order to achieve this vision of sustainability, the framework defined a 'systems approach.' This approach (depicted in diagram 2) defines three spheres, viz. the economy, socio-political systems and the environment that are to be amalgamated within each other and are therefore not to be seen as separate entities. However, sustainable development cannot be achieved until the three spheres are integrated with the governance system that "holds all the other systems together within a legitimate regulatory framework" (DoEA, 2008:15). In this way, sustainable development is achieved through the "continuous and mutually compatible integration of these systems over time"(ibid).

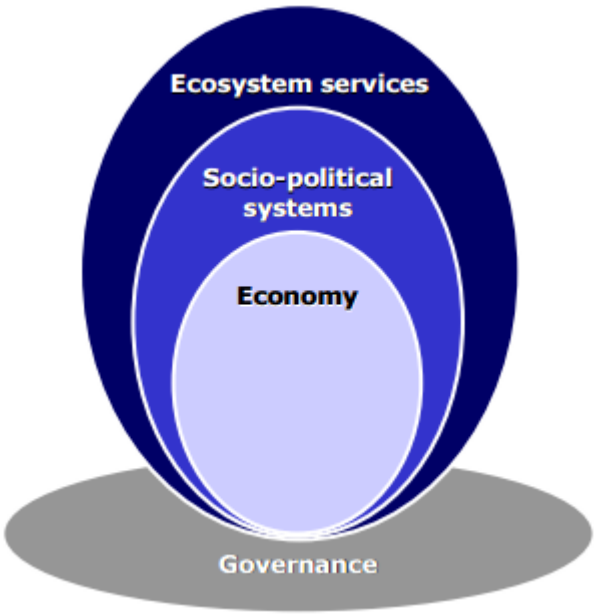


Diagram 2: Systems approach to sustainable development (DoEA, 2008:15)

The framework identified the following five 'strategic focus areas' that South Africa needs to address and strive for (promoted through appropriate strategies and policies), in order to maintain the above approach by:

1. Enhancing environmental, socio-political, economic and governance systems for integrated planning and implementation.

Due to the fact that sustainability encompasses the aforementioned spheres, this approach aims to re-orientate South African policy and society from unsustainable to a sustainable development as well as re-aligning and improving governance, with regard to its policies, laws, institutions and strategies involving sustainable development (DoEA, 2008).

2. Sustaining our ecosystems and using natural resources efficiently

This approach focuses on the "protection and management of the natural resource base of economic and social development", because, "South Africa's biodiversity provides an important basis for economic growth and development" (DoEA, 2008:34). Protecting and conserving the environment ensures the continuous provision of 'environmental services', such as, clean water, arable land and clean air.

3. Economic development via investing in sustainable infrastructure

This approach focuses on poverty alleviation through increasing investment in infrastructure; embracing mechanisms, methods and criteria to promote sustainable infrastructural investment; and developing skills and capacity for building and maintaining sustainable infrastructure (DoEA, 2008)

4. Creating sustainable human settlements

The housing climate of South Africa results in either many people within South Africa living in informal settlements, or the many suburbs that promote urban sprawl. Either way, people consume large quantities of primary resources (water, electricity, air quality, etc.); therefore the 2004 Breaking New Ground (BNG) policy was introduced and aimed at counteracting this situation. The BNG policy proposed the development of sustainable human settlements that created neighbourhoods that were mixed-use and socially diverse, and at the same time, residential living co-exists with the environment (DoEA, 2008). This approach also promotes "improved access to health facilities is an essential component of building more sustainable communities, and will directly influence initiatives aimed at dealing with diseases, which have broad developmental and economic impacts" (DoEA, 2008:38).

5. Responding appropriately to emerging human development, economic and environmental challenges

These include "climate change, rising energy prices, the HIV/AIDS pandemic, natural and other disasters, and the building and strengthening of international cooperation in the sustainable development field at national, provincial and local levels, and across sectors" (DoEA, 2008:40)

However, Todes (2011) argues that the challenge creating sustainable development is that even though there is an emphasis of sustainability practices within South African policy, sustainability is poorly managed and maintained within planning. Here you find that the aim of implementing sustainability struggles to materialise on the ground. It is possible that the reason for this is "owing to the lack of communication and integration between the different spheres of government" (Khan, 2014:31).

With regards to Durban, for sustainability to occur, "Local Agenda 21 programmes are prioritized within the strategic planning processes of local government, in order to ensure broad scale commitment and involvement" (Roberts and Diederichs, 2002:198). The reason for this, is that creating sustainability within development is complex as it involves various stakeholders, resources and priorities, i.e. is not spontaneous and needs to be planned for (Roberts and Diederichs, 2002:198). By doing so, sustainable development and programmes are able to meet people's basic needs and improve quality of life.

Sustainable Human Settlements

In 1977, the UN General Assembly established the Commission on Human Settlements. The objective of this commission was to assist countries/regions with human settlement issues and ultimately promoting greater international awareness of the concept, i.e. moving away from housing/building provision. The idea of sustainable human settlements (per the Commission's definition) ensures the relationship between economic development, employment opportunities and social progress, in harmony with the environment (Sustainability Institute, 2009). In order to better understand this relationship, sustainable human settlements can be characterised as follows:

- Balanced and appropriate geographical distribution in keeping with national conditions
- Promotion of economic and social development, human health and education
- Conservation of biological diversity and the sustainable use of its components
- Maintenance of cultural diversity as well as air, water, forest, vegetation and soil qualities at standards
- Sufficient to sustain human life and well-being for future generations.

(Sustainability Institute, 2009:8)

Kellett and Moore (2003) also define the characteristics surrounding both housing and human settlements, whereby "they are both a physical product comprising shelter and accommodation as well as a profound symbol of home, belonging, citizenship and the material manifestation of hard won socio-economic rights" (Kellett and Moore, 2003:124) With regards to the aspect of sustainability within the context of cities and human settlements, Swilling (2004) states that sustainability will only be achieved in cities and settlements if development does not exceed the renewal of earth's natural resources every time we choose to use such the natural resources. This is achieved when ecosystems are not destroyed when human needs are being met. But Sattherwaite (2004), argues that the idea of sustainability of human settlements is achieved when built form and governance structures/policies match sustainable development objectives.

This can be related to the City of Johannesburg (COJ), which defined 2 agendas for the creation of human settlements:

1. The need to respond to a rapidly growing demand for housing.

This is with regard to the fact that many of the new households needing accommodation are poor. Those who are poor have a lack of resources which restricts their access to bank finance, which limits their ability to buy houses. In relation to settlement formation, "the government cannot zone

land for residential development, assembling land by extending requisite services, and approving building plans", as it had done pre 1994 (CoJ, 2006:124).

2. A settlement cannot just house people

As stated previously, it is no longer sufficient to just provide housing to people in need. Therefore, the creation of sustainable human settlement involves "creating the conditions under which people in both new and established residential communities can enjoy healthy, productive and well-integrated urban lives" (CoJ, 2006:124).

Sustainable Human Settlements in South Africa

Byl (2014) states that one must understand the meaning of housing has evolved over time and what housing can do for people in South Africa. Policy with regards to human settlements has shifted from being concerned with notions of redress and redistribution, to understanding that housing can be seen as a key element with regards to building up assets for the poor (Byl, 2014:6). Due to the legacy of Apartheid, South Africa has incurred many repercussions, viz. spatial concerns, social fragmentation and challenges of participation and development. The sustainable development paradigm (discussed within Irurah and Boshoff, 2003) can be used to understand the idea behind housing and human settlements in South Africa which can be seen as somewhat of a dynamic process, whereby there has been a lot of change and evolution with regards to how such ideas are understood, perceived and approached with regards to policies and strategies, i.e. 1994 White Paper on Housing, BNG, Out-come 8, etc.

Types of Human Settlements in South Africa

Many major cities in South Africa have thrived with regards to "providing requisite service extensions and processing development applications to new bond financed homes by individual owner occupiers, and the building of apartments, cluster-homes or even lifestyle estates by developers for people to either rent or buy" (CoJ, 2006:130). But the more important measure of a city's success relates to whether or not there has been significant progress in housing poor people, especially those who have historically been excluded by apartheid from owning and using houses. For the purpose of this research report, focus will be placed upon 2 types, viz. Greenfield

Development and Prototype Programme, as they relate to new housing development, especially with regards to low cost housing.

1. Greenfield Development

Greenfield development occurs upon vacant, previously undeveloped, land. Thus such a development does not occur upon land that is currently occupied by any informal settlements. This type of development is usually led by private developers, but government initiatives also have a part to play, especially with regards to financing and service provision, such as "consolidating land for the developments, approving the township establishment plan, communicating with beneficiaries, etc. Such developments see the building of top structures at the same time as sites are serviced, but this is not necessarily the case" (CoJ, 2006:130).

2. Prototype Programme

The idea of the prototype programme for settlement development, defined by the City of Johannesburg (2006) can be seen as a development that targets new settlements on well-located land close to business and other amenities (CoJ, 2006). The difference between this programme and other types of SHS, such as Greenfield development, is that the programme aims to achieve much higher densities, with a mixture of single-storey units, semi-detached units and walk-up apartments. This programme was first proposed in 2004 in the city of Johannesburg. The idea was that the City would "carry all the costs of internal infrastructure on a to-dwelling pre-paid meter basis, and that the provincial subsidy would be used solely for new housing construction" (CoJ, 2006:132). The result would be that such a settlement would have well-serviced homes; the houses within this type of settlement would possibly attract future market interest as well as become a functional asset for the beneficiaries.

South Africa's Sustainable Human Settlement challenge

In 1994, South Africa's housing sector was experiencing challenges due to severe housing backlogs which lead to an increase of informal settlements, a result of apartheid policies which had created social and economic divisions (Gardner, 2003:1). Housing policies and legislative frameworks, administration and institutions were split or separated according to race and geography, resulting in institutions performing similar responsibilities in parallel. A large number of subsidy systems created more confusion by resulting in the unfairness of the distribution of state housing assistance and due to failure to maintain a long-term housing subsidy programme. As a result, private sector participation in low-income housing delivery was marginal. Many families were unable to afford

basic housing, owing to the limited finance provided by the financial sector. This lead to "civil unrest and inexperienced housing consumers further complicated the housing market and pointed to the need to normalise the housing market" (Gardner, 2003:2).

However, the Sustainability Institute (2009) argues that there are not many accurate examples of sustainable human settlements in South Africa although there are policies defining and promoting sustainability and sustainable human settlements (Sustainability Institute, 2009). This could be due to the "old approaches to township planning, infrastructure and housing design" (Sustainability Institute, 2009:1). Another reason for this could be due to financial constraints that may dominate over possible sustainable development approaches. Over and above implementation of sustainable practices to development, the Sustainability Institute (2009) argues that "at a grass-root level of tertiary education, you find that various disciplines, such as engineers, architects, planners, social scientists and environmentalists are trained in isolation from one another." This fragmentation continues into the working world, thus effecting settlement development negatively" (Sustainability Institute, 2009:1).

Housing and human settlement policies in SA

This section looks at South African housing policies such as the 1994 White Paper on housing, 1997 Housing Act, and 2004 Breaking New Ground Policy, with regards to housing and human settlements.

1994 White Paper: A New Housing Policy and Strategy for South Africa

The African National Congress (ANC)-led government enacted the 1994 White Paper on Housing after its democratic election in 1994 (Tissington, 2010:33). The White Paper aimed at delivering 350 000 houses per annum in order to eliminate housing backlogs. The principles of the new housing policy include economic empowerment, affordability, accountability, sustainability, innovation, economic empowerment, people-centred delivery and partnership, fairness and equity, fiscal affordability and choice (Republic of South Africa, 1994:20–27).

The 1994 White Paper on Housing intended to meet the housing challenges by providing the following:

- A permanent residential structure with secure tenure, ensuring privacy and providing adequate protection against the elements
- Potable water, adequate sanitary facilities including waste disposal, and a domestic electricity supply

(White Paper, 1994:20)

The Housing White Paper further states that necessary steps will be taken to recognise this vision for all South Africans, while acknowledging the importance of economic development, employment and the contribution of housing credit providers as a requirement to fulfil the national housing vision. The National Housing Subsidy Scheme, administered by the Provincial Housing Board, played an important role in reducing the plight of the poor through offering a once-off capital subsidy for land and housing infrastructure to individuals in certain economic categories (Republic of South Africa, 1994:41).

1997 Housing Act (Act 107)

The Housing Act, followed the Housing White Paper as a continuation of guidelines, programmes and provisions stipulated in the White Paper. The Housing Act aims to offer the facilitation of a sustainable housing development process. This is done through "establishment and maintenance of habitable, stable and sustainable public and private residential environments to ensure viable households and communities in areas allowing convenient access to economic opportunities, and health, education and social amenities" (Housing Act, 1997:141). The Housing Act, together with the Constitution, further outlines the role of the national, provincial and local governments in relation to provision of housing (Housing Act, 1997:139). The national department is mandated to set up and facilitate a sustainable national housing development process.

However, provinces have proactively developed their own housing policies that push the boundaries of this framework, for instance the Gauteng Investment Partnership for Housing and the Mayibuye Upgrading Programme that is intended to improve housing delivery by offering land settlement first before servicing and developing houses (Gardner, 2003:31).

2000, National Housing Code

The National Housing Code (2000) defines the housing policy of South Africa and the guidelines for the effective housing implementation of the policy. The vision of the code, with regard to housing in South Africa, builds on the definition of 'housing development' contained in the Housing Act, whereby, the housing code states that:

"The establishment and maintenance of habitable, stable and sustainable public and private residential environments to ensure viable households and communities, in areas allowing convenient access to economic opportunities and health, education and social amenities, in which all citizens and permanent residents of the Republic of South Africa will, on a progressive basis, have access to" (Department of Human Settlements, 2002:4)

2004 Breaking New Ground Policy

In response to the demand for housing and the need to move away from just housing provision, the BNG policy was initiated in 2004. The policy framework aims to develop more liveable, equitable and sustainable cities. This is done through several key elements, such as, "pursuing a more compact urban form, facilitating higher densities, mixed land use development, and integrating land use and public transport planning, so as to ensure more diverse and responsive environments whilst reducing travelling distances" (BNG, 2004:11). The idea of this policy was to move away from the quantity over quality mind-set of subsidised housing development and delivery.

The approaches in which the BNG is able to promote sustainability within the human settlements occurs through its four pillar programme:

1. Addressing environmental challenges

This approach deals with environmental challenges by promoting sustainable practices that limit the depletion of environmental resources through efficient settlement development and planning. This includes, land conservation, urban integration, water conservation, efficient renewable energy practices, waste management. In this way, an example of human settlements that promote some of these sustainability practices can be seen by building materials used within settlement development. Alternatives such as recycled cement, clay bricks and recycled, renewable and eco-friendly building materials can be used, in opposition to usual building material, such as cement with aggregate, concrete blocks, and non-renewable and non-recyclable blocks (Darkwa, 2006).

2. Generating economic empowerment

This approach deals with creating economic growth, within settlement development, through creating secure tenure, informal settlement upgrading, job creation and land reform. Housing subsidy is another method of generating economic empowerment within settlement development (Darkwa 2006). Economic empowerment is particularly important as it has a very strong social and economic benefit for people from previously disadvantaged groups.

3. Enhancing social capital

This approach deals with enhancing social capital with settlement development by meeting socio-cultural needs and practices of residents. For example, this can be done by creating integrated housing, which has various forms of tenure that meet the needs of individual households. "In a sustainable human settlement, planning, designing and managing the physical environment can

reduce crime and make communities safer. Community members can initiate this through various efforts, for example by developing safety plans such as community watches" (Darkwa, 2006:28).

4. Building institutional capacity

This approach deals with enhancing institutional capacity of settlements with regards to implementation, development and management. The promotion of accountability is an example of building institutional capacity whereby all stakeholders involved within settlement development are held accountable for the decisions with regard to sustainability in terms of housing development within the settlement. "The stakeholders including the national, provincial and local governments, non-governmental organisations and community-based organisations need to work together to create viable communities" (Darkwa, 2006:28).

Sustainable Housing

The most rudimentary understanding of research pertaining to sustainable housing, is that sustainable housing can be seen as the relationship between a house and its natural environment/ecosystems. As stated previously, the primordial need for housing and shelter has not changed much, thus housing and development play a major role in today's cities. As the process of urbanization increases over time, cities therefore have to grow in order to accommodate the influx of more and more people. But the way in which a city responds to urbanization is key to ensuring the future sustainability of the city. This can be seen when Daly (1996) differentiates between growth and development. He states that growth can be defined as an increase in size/quantity and development can be seen as 'qualitative improvement.' Therefore as development increases, it effects humanity's Ecological Footprint. With regard to sustainable housing and research, due to the impact of human activities, it is of paramount necessity that sustainable practices should be undertaken within development and housing. The implementation of sustainable housing practices "embraces socio-economic empowerment and affirms cultural identity, while recognizing the need for institutional facilitation and resource efficiency" (Syn-Consult Africa, 2006:56). Implementation of successful sustainable housing should create a relationships between the aspects in the diagram below:

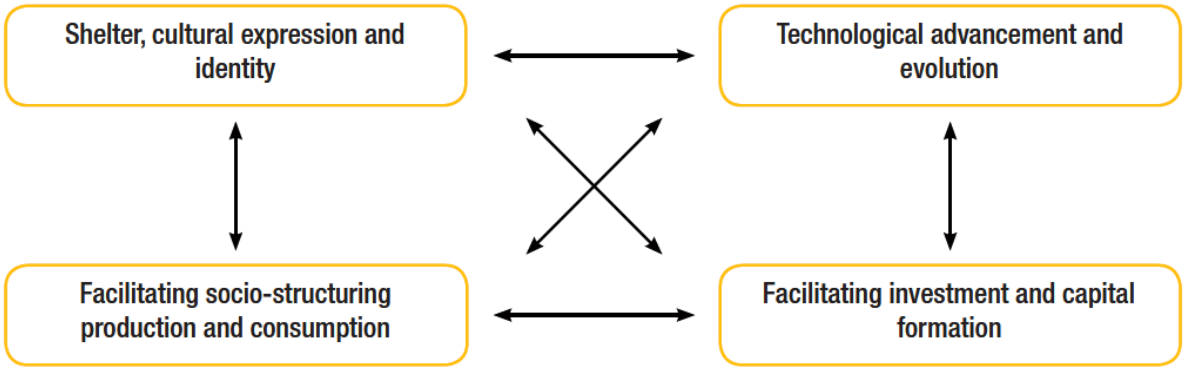


Diagram 3: Complexing and co-evolution of built environment, civilisation and development. (Irurah, 2004).

Ultimately, it is of paramount concern that all stake-holders involved in creating sustainable housing adopt a new way of recognizing opportunities for residential development, in partnership with the private sector and community based organizations (Sustainability Institute, 2009:9) over and above looking at the ecological impact of such housing development only.

In South Africa, Behrens & Wilkinson (2003) highlighted that past housing development practices, from a sustainable resource use perspective, have been undertaken in an extremely unsustainable way. This is seen by "massive urban sprawl and the destruction of potentially productive land, low numbers of housing units per kilometre of infrastructure line, rising levels of waste output, increasing levels of energy and material use, etc." (Behrens & Wilkinson, 2003:2).

South Africa's Housing challenge

As stated previously, the housing problem in South Africa can be regarded as a crisis, but it can be argued that it is more of a challenge than a crisis. Over the past 20 years, the progress of housing delivery by government cannot be ignored or disregarded, as there has been a steady supply of housing. The three main housing challenges South Africa faces with regards to creating SHS:

1. Understanding and determining demand

If the demand for housing is not easily identified or determined, it makes it very hard for a city to adequately meet the needs of its people nor implement programmes to meet that need. Determining the actual demand for housing has been a major problem for many cities in SA. A key cause of the housing challenge is due to segregation within Apartheid. After 1994, "a wave of urbanisation, previously dammed up by apartheid influx control, washed across all cities" (CoJ, 2006:124). This released the latent demand for housing and therefore government has found it very hard to both deal with the 'post-apartheid release of pressure' as well as calculate how much of demand for new housing is still to come (ibid).

2. Shared Responsibility

When government rolls out programmes for housing, it accommodated many different stakeholders within all process of a given programme. Within the 1997 Housing Act, municipalities are mandated to implement housing programmes in their area with regard to their IDPs. Therefore, in order to do this, a city has to engage with many other role-players. But this idea of a shared responsibility can be both a help and a hindrance. On the one hand, alone, government would not have the resources to roll out programmes independently. Therefore, on the other hand, by relying on different role players to roll out a programme, it allows for more mistakes to occur (CoJ, 2006).

3. Issuing of title deeds

Though government has not been able to meet the housing needs as a whole, over the past 20 years, it has been able to steadily supply housing. But one of the biggest problems that people face with regards to housing, over and above provision, is that of issuing title deeds. Morare (2014:1) also highlights the notion that "there is no crisis, as delivery has been steady against a fast-growing demand, and has slowed only in the last few years. The real crisis is perhaps in the issuing of title deeds, which is lagging" (Morare, 2014:1). Morare goes on to state that other issues faced by the poor, like unemployment, inequality and poverty, cannot just be solved by housing provision alone.

Cornubia Integrated Human Settlement

A private sector property developer, Moreland Development, originally conceptualised the Cornubia Integrated Human Settlement in 2004 and discussions followed between eThekwini Municipality and Tongaat Hulett Development (THD) to create different housing typologies for people across different income groups (Sutherland, Sim, Scott & Robbins, 2011:2). The conceptualisation of the housing programme commenced in 2004 between eThekwini Municipality and Tongaat Hulett Development through a public-private partnership. The programme comprises of several phases, starting with Phase 1A comprising of 486 low-cost housing units. These pilot phase units were officially handed over to beneficiaries on 5 April 2014 (SA Government News Agency, 2014). The targeted beneficiaries included households from informal settlements within the eThekwini Municipality, such as Kennedy Road Informal Settlement. The pilot phase will be followed by further phases for either low- or middle-income households that will be finalised over the next 20 years. These phases will offer housing typologies (community residential units, using a social or institutional subsidy mechanism) that will cater for various income groups in order to meet inclusionary housing objectives (Iyer Urban Design Studio, 2011:11).

Cornubia is considered as first proposed sustainable and fully integrated human settlement within Durban. The development is undertaken by Tongaat Hulett Development in collaboration with government and key stake holders. Cornubia is situated within the North Urban Development Corridor (NUDC) Plan in Durban. Tongaat Hulett Development (2014) stated that the primary objective of the development is to bring people from the lower socio-economic levels and job opportunities into the same location "through leveraging, assembling, and systematically aligning multiple institutional, financial, human and managerial resources, in a creative and innovative manner" (Tongaat Hulett Development, 2014:1). Ultimately, the aim of this development is to create a better life for all, through urban restructuring and renewal. The idea of Cornubia is not just low-cost housing provision, it also contains bulk commercial and industrial developments.

Cornubia and Department of Human Settlements

The Cornubia Housing Programme complied with the following requirements set out in the National Housing Code (2000:197–198):

- The project-linked subsidies were made available to the eThekwini Municipality which undertook the approved Phase 1A of the Cornubia Housing Programme.
- The need for the Cornubia Housing Programme was identified and initiated by THD and the initiative did satisfy the Provincial Housing Development Board (PHDB) as it had adequate access to financial resources, technical and managerial experience to undertake the Cornubia Housing Programme. The aim of the assessment was to ensure that both the eThekwini Metropolitan Municipality and THD were technically, managerially and financially competent to implement and successfully complete the housing programme.

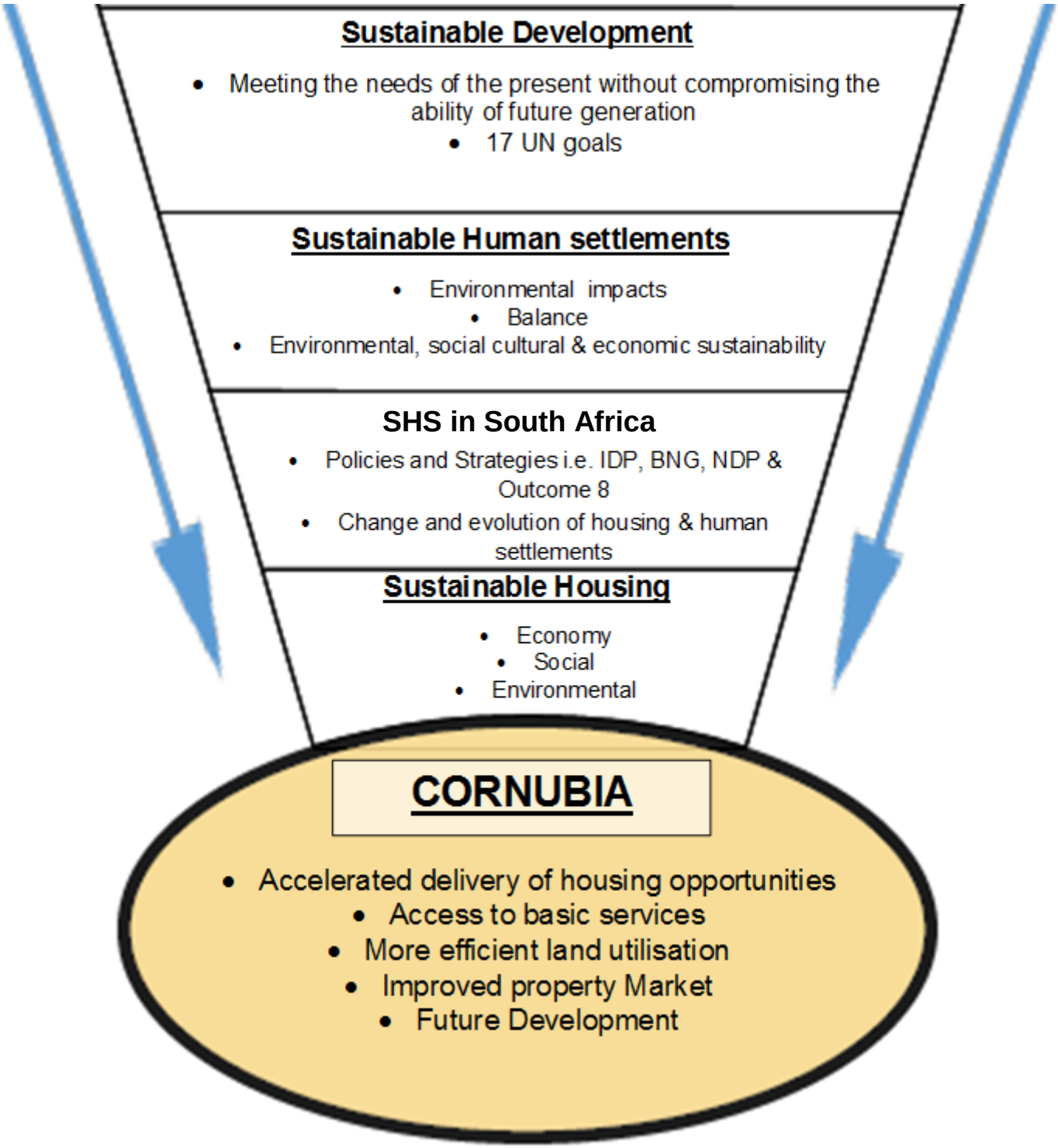
In 2014, the eThekwini Municipality handed over housing units to the qualifying beneficiaries that met the following requirements stipulated in the National Housing Code (DoHS, 2000:175):

- The applicants were married or cohabiting with another person, or were single and had proven dependants who rely on the applicant's financial support.
- The applicants were legal South African residents.
- The applicants were legally competent to enter into a contract, implying that they were above the age of 21, if not married.
- The gross monthly household income of the applicant did not exceed R3 500 per month.

- The beneficiary or spouse had not previously received a subsidy from the government to purchase a house.
- The applicants were property owners for the first time.

Though the municipality has handed over many homes to people, there are still many more families who are still waiting for a house. It can be assumed that one more housing phases have been completed, more people may access such houses.

Concluded Conceptual Framework



In summation, the idea of my concluded conceptual framework is that of an inverted pyramid of scope, whereby further down the pyramid, the smaller the scope of analysis and the more intense on specific details. Each tier influences the tier below it, in one way or another. The conceptual

framework highlights the most important aspects from the literature review. Firstly I start off by understanding the concept of Sustainable Development. Secondly, I defined what encompasses a sustainable human settlements with regards to what is needed for a settlement to be considered sustainable. Thereafter I define what constitutes SHS in South Africa, i.e. how the Department of Human Settlements defines sustainability. In order to understand this, I have looked at policies and strategies put in place, with regards to creating sustainable human settlements, viz. IDP, BNG, NDP, Outcome 8, etc. From this I then understand what the parameters are for Sustainable Housing, and what sustainable housing practices are available, within the environmental, economic and social aspects.

Ultimately, this leads to the Cornubia Integrated human settlement. Each of the five tiers within the pyramid informs the context of Cornubia with regards to the type of development and the objectives of the project. From this I will be able to answer my research question.

Chapter 3 – Research Methods and Methodologies

Introduction to the direction of research

This research on sustainable human settlements revolves primarily around the Cornubia Integrated Human Settlement, whereby the sub-questions are raised, in line with the overarching research question. Focus is placed upon the understanding of sustainability and the importance of understanding the complexity of sustainable human settlements. The research encompasses qualitative methods whereby an exploratory analysis is undertaken to understand the practices and performance of the housing development in Cornubia. The extent of sustainable practices are explored so as to identify the subsequent outcomes of the development. A case study of Cornubia has been undertaken, to understand the current sustainability practices of the housing programme and an investigation of how this programme facilitates the entire Cornubia development with regards to sustainable human settlements. Interviews have also been used to obtain qualitative data. Such interviews were conducted with residents and a property developer of Cornubia. The interviews conducted with these individuals are of paramount importance as they are directly involved with the development and its subsequent outcomes. The rudimental use of such methods is to understand what is actually happening within Cornubia in regards to sustainable human settlements.

Research methods in detail

Within my literature review, I have reviewed a combination of sources, such as, newspapers, the internet, academic journals, books and newsletters. Through my literature review and my method of gathering information, I have come to understand that each source of data has strengths and limitations. To gain insight into the on-goings of the housing programme in Cornubia, I have also conducted semi-structured interviews with a property developer (from Tongaat Hulett Development) and residents of the housing programme. The questions asked in these interviews were constructed around aspects of sustainable development, sustainable human settlements and sustainable housing. The reason for why I chose to conduct an interview with the property developer is that I believe she had appropriate knowledge of the integrated human settlement, from a policy and development point of view. I have also conducted interviews with four residents of Cornubia to get a more in-depth understanding of what constitutes, in their perception, a sustainable human settlement. Questions asked within this interview are in regards to aspects of sustainable development, related specifically to housing. These residents were chosen through purposeful sampling due to their relation to Cornubia. The use of purposeful sampling within qualitative research is to identify and select information-rich cases for the most effective use of limited resources (Patton, 2002). Given my limited time-frame, I could only conduct interviews with a

handful of people. I therefore chose to interview such people as I feel that they have given me the most appropriate information regarding my research due to their relation to both the housing programme and entire development.

The value of qualitative research methods

The idea of qualitative research is to provide more substantive information regarding why and who, as compared to quantitative methods. Qualitative research is able to help comprehend a specific topic by unearthing related trends. By understanding and analysing these trends, a researcher is able to have a more in-depth understanding of the specific problem or topic. This value of qualitative methods within research can be seen whereby "qualitative data can explore narrowly-defined issues in greater depth, explaining the setting in which behaviour takes place. The goal is to build a complete picture of the issue being studied" (Colin, 2010:1).

Information required

I have gathered information needed to answer my research question from three main methods, viz. literature review, interviews with residents and interview with a property developer from Tongaat Hulett Development. The information that I have gathered has helped to identify the development, implementation and management of Cornubia. This has helped me identify what constitutes Sustainable Development in the context of South Africa and the Department of Human Settlements. The information gathered from the three methods below have helped investigate how government, private sector and communities engage with sustainability and sustainable human settlements in Cornubia. With regard to interviews, the criteria for the selection of stakeholders as respondents for the interviews were:

- Those who are involved with the housing programme either as residents or developers.
- Those who experience and/or influence the sustainability of the housing programme and Cornubia development.
- Those who accept to be interviewed

It must be noted that the residents who have been interviewed have also been chosen due to their difference in composition, economic activities, backgrounds and household size. Each of the residents interviewed have different needs, thus helping to better understand the requirements and essentials for residents in a sustainable human settlement.

Method 1 – Literature review

Drawing from my literature review, my first method was to review research pertaining to: sustainable development, sustainable human settlements, sustainable human settlements in South Africa, sustainable housing and information around Cornubia Integrated human settlement. From this, I was able to derive my conceptual framework, which helped define the research direction of the following methods:

Method 2 – Semi-structured interviews with residents of Cornubia through purposeful sampling

The first set of interviews was conducted with residents within the Phase 1 of the Cornubia residential development. As stated previously, given my limited time-frame, I could only conduct interviews with a handful of people. I therefore chosen to interview such people as I feel that they have given me the most appropriate information regarding my research due to their relation to both the housing programme and entire development. I have chosen such people as they have come from different backgrounds (detailed further in Chapter 5). As such, these people are directly affected by the way in which the current housing development has been conducted and the subsequent outcomes. Specifically, they experience the outcomes of the various sustainable practices utilized within the development (or lack thereof). They provide valuable insight to sustainable housing and human settlement practices which have been put in place, i.e. its successes and challenges. Ultimately, such people have hands-on experience with the details of the housing development.

All interviews with residents occurred within the residents homes. I had asked 8 people if they would like to be interviewed. Only 4 people allowed me to interview them, within their houses. I felt as if this was the most comfortable place for them to conduct interviews with me. It also allowed me to see what the physical manifestations of the housing programme was. Each interview took approximately forty five minutes to one hour to conduct. Only three of the four residents allowed me to auto-tape the interview.

Method 3 – Semi-structured interview with property developer at Tongaat Hulett Development

Although the topics of the interviews of both residents and the property developer are similar, i.e. sustainable human settlements and housing, an interview with a property developer from Tongaat Hulett Development helped to provide insight into the policies, strategies and frameworks utilized within the housing development. It must be noted that an interview with a government official from the Department of Human Settlements was unsuccessful. Unfortunately, the official was unable to meet for an interview given my limited time-frame and their availability. The official's input would have added great depth within this research, as the official overlooked the development of the

housing programme within Cornubia. One must understand that Cornubia is still within its early stages of development. Property developers are directly involved in construction of the housing development, thus having a great deal of influence on the outcome of the development. Ultimately, they provide the utmost knowledge of what sustainable practices have been utilized.

The interview with the property developer occurred at the Tongaat Huletts Development office. I was lucky enough to secure the interview immediately, however, my time frame was limited to approximately thirty minutes. The property developer did allow me to auto-tape the interview.

Using case studies in research

Baxter and Jack (2008) define the use of a qualitative case study as an approach to help investigate a phenomenon within its context through different data sources, thus ensuring that the phenomenon is not observed through a single lens, rather different lenses which expose many aspects of the phenomenon. With regards to my research, the design of my case study aims at understanding the experiences and views of various stakeholders associated to both Cornubia and its Housing Programme. I will be conducting a single, evaluation case study. The aim of doing such a case study is for evaluation research, whereby key issues pertaining to how the case study is to be unpacked will be developed through my conceptual framework. Ultimately, I want to evaluate Cornubia within a real-life context in which it occurs. The use of a case study in this research is used to "investigate a contemporary phenomenon within its real-life context" (Yin, 1994:13). In this way, I want to investigate sustainable housing within Cornubia. To formulate a better understanding of the aim of my case study, work can be drawn from Levy (2008) whereby he defines 'idiographic' case studies in this manner: the "aim is to describe, explain, interpret, and/or understand a single case as an end in itself rather than as a vehicle for developing broader theoretical generalizations" (Levy, 2008:4). The way in which I went about compiling the case was through process, implementation and outcome. Firstly I looked at what has been envisioned for the housing programme. Secondly, of these strategies and plans, what has and has not manifested. Finally, I looked at the outcomes of what has been implemented.

Limitations of Research

Although qualitative research in general aims to understand contexts, define interpretations and meanings, and presents a more realistic view of the world; there are some limitations. With specific regard to my research report, the biggest limitation thus far is that such research can be very time consuming. This is especially true when trying to gather information in the field, through interviews. I have also had a limited timeframe for the study, therefore chose to only conduct 5 interviews, as I

had limited field work time. These are the reasons to why I have chosen to only interview 5 respondents. Another limitation to my research is the ethical issues of entering the personal sphere of my respondents. Although the interviews did not cover any sensitive issues, I was still entering their personal sphere. I have been very careful to consider all ethical issues prior to conducting surveys and interviews. The challenges when collecting data during the interview period was the non-availability of some respondents. I had initially tried to interview an official from the eThekwini Municipality who was responsible for the municipality's involvement within the housing programme. Unfortunately, the official was not able to commit to an interview. The insight of the official could have added another perspective to the research as the property developers are only responsible for the construction of houses, whereas the municipality was in charge of the planning associated to housing programme.

Conclusion

This chapter details the various methods used, in order to retrieve information what began to answer both my research question and sub-questions. The use of a single case study approach has been criticised, as it is seen as a limited research strategy of only having a single focus when looking at an issue. However, given my time frame and the information I need, a single case study is sufficient and purposeful. As I conducted a more in-depth analysis of Cornubia, the chosen respondents included both residents of and one official associated with Cornubia. Per my literature report and the subsequent conceptual framework, I have been able to define the areas of knowledge needed to better understand Cornubia. The investigative approach of within this section will help paint a picture of sustainable practices used to create SHS and sustainable housing. I am aware of the limitations of my research and the number of interviews that I can conduct are limited due to influences that are beyond my control, such as the amount of time allowed for research to occur.

Ultimately, I have been able to interview 4 residents and 1 property developer from Tongaat Hulett Development.

Chapter 4 – Case Study Overview

Introduction

This chapter describes the context of the case study, in terms of the locality, vision, land ownership and site considerations. The residential programme and the entire developments relation to SPLUMA will also be discussed in detail.

Locality

Cornubia is located within Kwa-Zulu-Natal (Diagram 4) in the EThekwini Municipality, within Durban's Northern Corridor (Diagram 5), between Phoenix and Mount Edgecombe in the south, Ottawa in the west, Umhlanga in the east and Waterloo in the north.



Diagram 4: Location map of KZN and Durban
(//www.southafrica-canada.caPNGmap_south_africa.gif)



Diagram 5: Location of Durban in relation to KZN
(http://www.booktravel.travel/images/map-greater_durban.jpg)

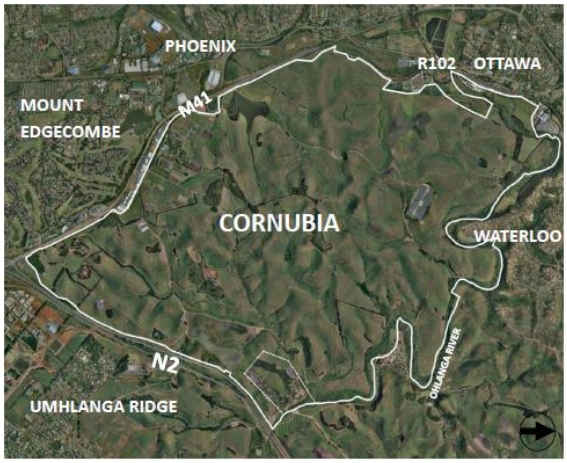


Diagram 6: Borders of Cornubia
(EThekwini Municipality, 2016:7)

Cornubia is situated 7km south of the King Shaka International Airport (highlighted in diagram 7), and 25km from the Durban CBD. The total surface area of the Cornubia development spans 1331

hectares and incorporates bulk commercial (32% land coverage) and light industry (22% land coverage), as well as residential and open space areas (46% land coverage).

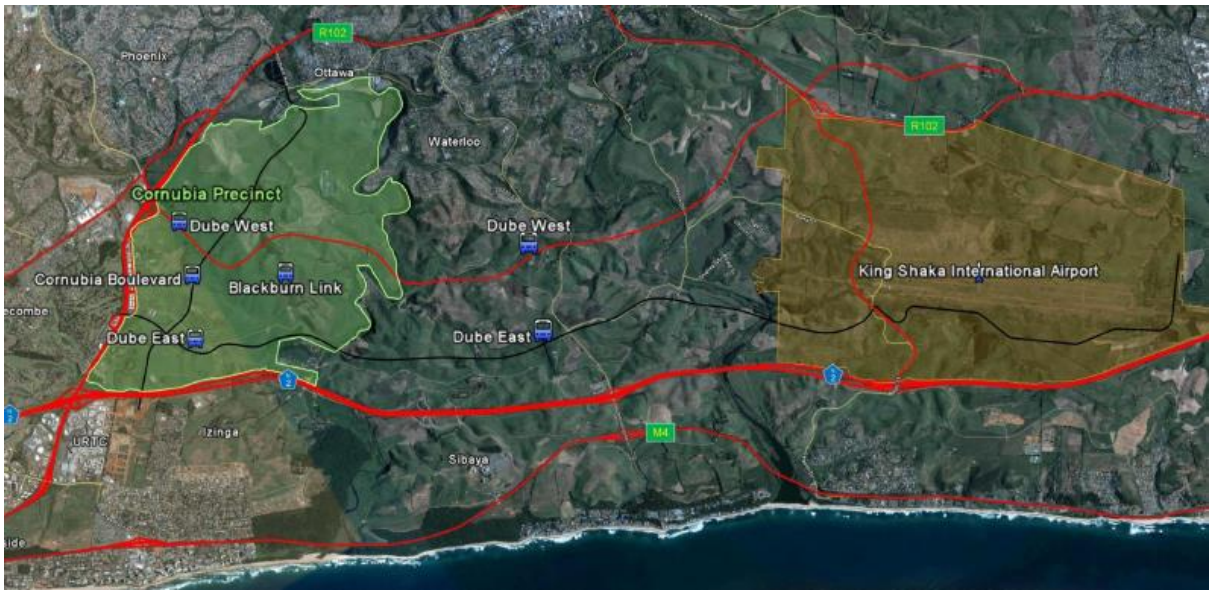
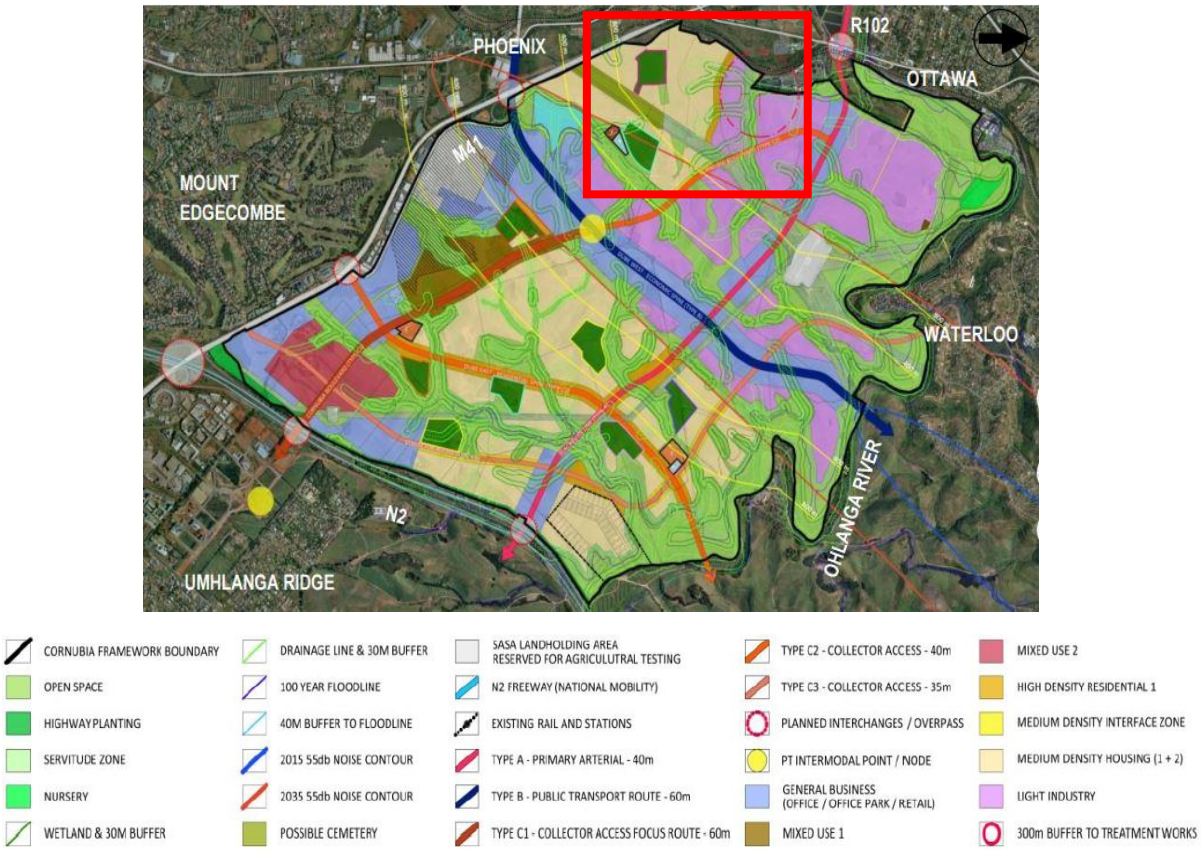


Diagram 7: Location of the development site (green) in relation to the King Shaka Int. Airport (orange) and the Durban coast (Cornubia framework plan: presentation to ECOD, 2011)

Diagram 8 depicts the various land-uses of the development. The residential development (Phase 1a) that is focused upon within the case study, is highlighted in red on diagram 7.

Diagram 8: Land uses of Cornubia per the Framework (Iyer Cornubia Planning Report, 2013)



EThekwini Municipality's Vision of Cornubia

Cornubia is part of the Durban City restructuring programme, whereby it facilitates the regional integration and development of the Northern Urban Development Corridor (NUDC). In this way, Cornubia aims to provide an opportunity for those from impoverished areas to link with more affluent areas, so as to facilitate in creating a better quality of life for all. As stated previously, in 2008 Tongaat Hulett Development and government signed a Cooperation and Alignment Agreement which defined the terms of a partnership involving the development of the NUDC along the Durban Coast (Tongaat Hulett Development, 2014:1). "Tongaat Hulett Development agreed to sell 659 hectares of land to the Municipality for the development of subsidised housing and on the balance of the land, Tongaat Hulett Development is currently developing a range of commercial, industrial and market-related residential uses to support and complement the lower-income housing" (Tongaat Hulett Development, 2014:2). By doing so, the development seemingly utilized the opportunity for creating a public-private partnership (PPP) between the eThekwini Municipality and Tongaat Hulett Developments.

With regards to the core objective of the residential development, Cornubia aims to create a liveable environment through the integration of a range of economic and social opportunities. The reason for this is that the development aims to respond to the legacy of spatial and balances of historical planning (eThekwini Municipality, 2010:1). Therefore the location of the development assists those who have been previously disadvantaged to be closer to job opportunities, social amenities, major services and public transport, thus promoting all aspect of sustainable human settlements. The development also aims to embrace and ensure all aspects natural, social and economic environments (eThekwini Municipality, 2010:1).

With regards to the social aspect of the housing development, the development aims to design and incorporate schools and recreational facilities which are accessible within a short walk from housing developments. The streets within the housing development are aimed to be pedestrian friendly and to include cycle lanes where possible in order to create a healthy, sustainable and liveable human settlement (eThekwini Municipality, 2010:1).

Land ownership

As stated previously, Cornubia is a partnership between Tongaat Hulett Development and the eThekwini Municipality. The area of the development spans 1331ha. With regards to ownership, from the diagram 9, the municipality owns 659ha, which will be used for the provision of subsidised and affordable housing. Tongaat Hulett Development owns 579ha, which will be mixed use, light industry, general business and medium, density residential development. The South African Su

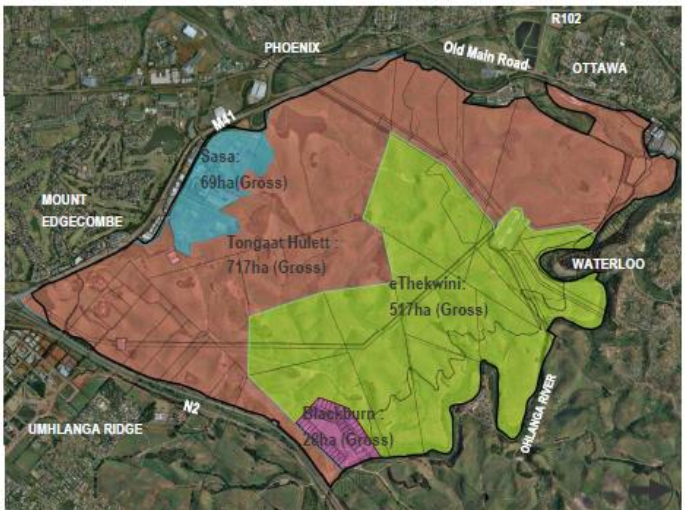


Diagram 9: Distribution of land ownership
(Iyer Cornubia Planning Report, 2013:25)

Association owns 69ha and the Blackburn Village owns 24ha.

Site considerations

The total area of the development is characterised by "steep and undulating topography, wetland areas and floodplains," which is defined in diagram 9 below (eThekwini Municipality, 2016:19). From diagram 10, it can be seen that the wetlands and drainage lines occupy approximately 29% of the site. Given that the airport is 7km from the airport, there is a 55db noise contour, which restricts the development of noise sensitive land uses such as residential areas and schools (eThekwini Municipality, 2016:19).

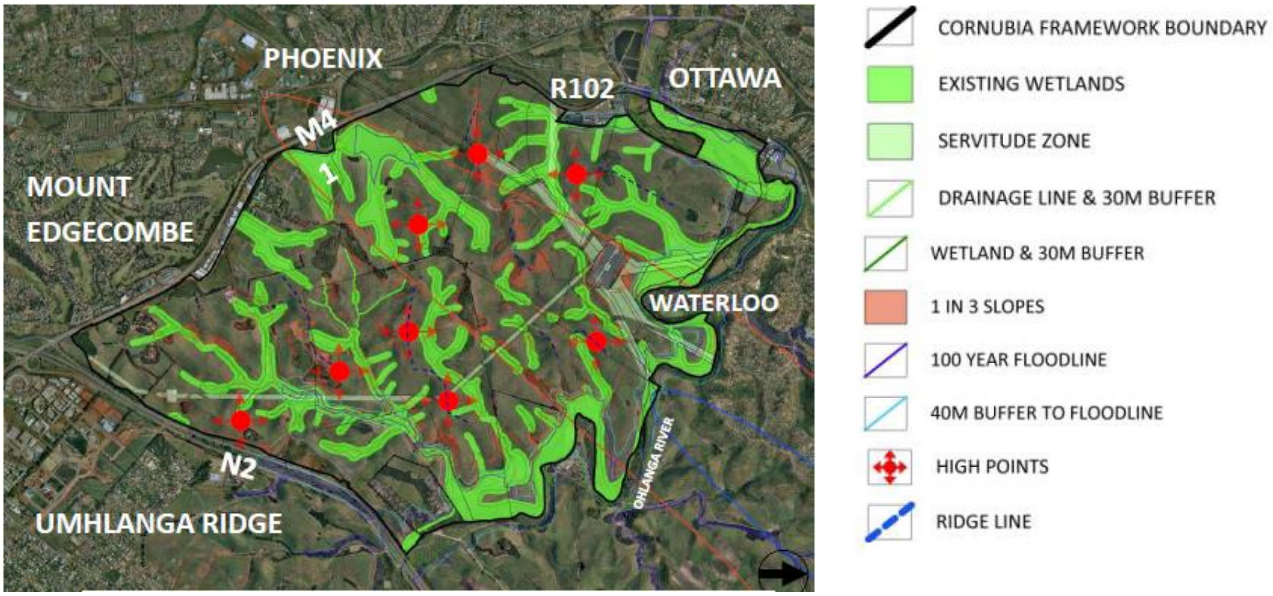


Diagram 10: Environmental Site Considerations of Cornubia
(EThekwini Municipality, 2016:19)

Housing Programme

With regards to the Housing Programme, the total approximate yield of residential units is 25000, which will be developed in several phases. Phase 1 aims to yield 5000 units. Phase 1b aims to develop approximately 2186 houses. The total aim of the residential programme of this development is to deliver 24320 subsidised units. 48% of this will cater for households earning under R3500 per month, which amounts to approximately 11664 units at 80 du/ha and 100 du/ha. 12% of the housing will cater for households earning between R3 501 to R15 000, which amounts to 2880 units at 80 du/ha. 18% of the housing will comprise of social/gap housing for households earning R7001- R15000, which amounts to 4400 high density units at 250 du/ha. The remaining 22% of the housing will comprise of Mixed Use 1 and 2 category housing for sectional title units, which amounts to 5376 units are proposed at 200 du/ha. In this way, it is projected that Cornubia has the potential to accommodate approximately 125,000 people (eThekwini Municipality, 2016:27).

The eThekwini municipality defines the phase one houses as BNG units which are seen as affordable and sustainable housing with an option for a range of income groups (eThekwini Municipality, 2010). In this way, the houses and the housing programme promote the principles of BNG so as to achieve a "non-racial, integrated society through the development of sustainable, integrated human settlement and quality housing" (eThekwini Municipality, 2011:1). Phase 1a was seen as the pilot project of the development as it was a green-fields development. The morphology of the units is all double storey semi-detached units. As stated previously, the residential development will occur through 7 phases. The beneficiaries of the Phase 1a houses have received a freehold tenure (after 5 years of residence), whereas the units of the other phases will be for rental for either low or middle income households and will adopt either the community residential units (CRU), social or institutional subsidy mechanisms (EThekwini Municipality, 2011). The aim of the various housing typologies is to cater for different income groups, thus promoting inclusionary housing, which ultimately aims to integrate various people from various income levels.

The residential development for low income households was seen as a project for urgent slum clearance. As stated previously, the eThekwini Municipality suffers from many informal settlements. Cornubia can be seen as a development which responds to this problem, as the targeted beneficiaries are those of low income households which reside in the various informal settlements in the surrounding areas of the development. However, slum clearance can be seen as an appropriate and sustainable response to informal settlements. The municipality has undergone many projects of in-situ upgrading, such as Cato Crest in Cato Manor in Durban. This project resulted in the in-situ upgrading of only 1500 homes, however, there was 2500 homes in the area that were still

considered informal. It can be assumed that the large number of projected units to be developed in Cornubia can be seen as a way to resolve such housing issues.

Development relation to SPLUMA

Though the principles associated with the residential development of Cornubia are in line with the BNG policy, the eThekwini Municipality deems entire development as compliant with the development principles of SPLUMA. The development is seen as an opportunity to improved land access, therefore redressing previous spatial imbalances due to Apartheid. The creation of a human settlement also allows for the previously disadvantaged, from different income groups, to be integrated together. The development of human settlement also provides employment opportunities as well as provision of adequate social and recreational, thus creating viable communities (eThekwini Municipality, 2016:31). The way in which the residential development is designed and implemented, also provide access to tenure, especially for those who are disadvantaged.

The prime location of the development, within the development corridor, allows for the reduction of urban sprawl, thus impacting positively upon environmental sustainability. Ultimately, the "institutional and administrative arrangements for development applications ensures a quick turnaround time" (eThekwini Municipality, 2016:31).

However, SPLUMA states that all informal settlements must be integrated into the urban fabric so as to maintain and preserve spatial justice and spatial sustainability. By bringing people into the development, such people will be disturbed with regards to where they work and live. It is possible for the municipality to look into other avenues so as to not simply eradicate slums and informal settlements, but rather provide other solutions so as to incorporated informal settlements within urban areas.

Conclusion

The total land coverage of the Cornubia Development spans approximately 1331ha. Of this total area, the eThekwini Municipality has created a PPP with Tongaat Hulett Development, whereby Tongaat Hulett sold 659ha to the municipality for the provision of subsidised and affordable housing. It is situated between many well established urban areas and suburbs, such as Phoenix, Verulam, Ottawa, Mount Edgecombe and Umhlanga. The N2 freeway and M41 Arterial that border the human settlement provide ease of access to many other areas which are not adjacent to the development,

such as the King Shaka International Airport, Gateway Theatre of Shopping and the Durban CBD. Though Cornubia is developing a multitude of various land uses, those who reside in the area will be able to access various other job opportunities as well as other commercial and industrial activities within Durban. The location of the development assists the vision of the eThekwini Municipality with regards to its 'Durban City restructuring programme' along the NUDC. The location of the development also assists the vision for Cornubia whereby it aims to provide an opportunity for those from impoverished areas to link with more affluent areas, so as to facilitate in creating a better quality of life for all. By providing subsidised housing, the Housing Programme of Cornubia also facilitates in creating a better life for all whereby the development assists those who have been previously disadvantaged to be closer to job opportunities, social amenities, major services and public transport. Unfortunately, there are challenges with regards to site considerations whereby the total development covers many wetlands and is characterised as having a steep and undulating topography. Such site considerations have posed as a challenge to development along with the 55db noise contour, which restricts the development of noise sensitive land uses such as residential areas and schools (eThekwini Municipality, 2016:19). This has posed challenges for the housing programme of Cornubia which aims to yield 25000 units over several phases. The Housing programme aims to accommodate approximately 125,000 people within various housing typologies. The targeted beneficiaries are those of low income households which reside in the various informal settlements in the surrounding areas of the development. In this way, the housing programme is part of the BNG policy, but the whole Cornubia development is also compliant with the development principles of SPLUMA, through the creation of a sustainable human settlement. The creation of a human settlement also allows for the previously disadvantaged, from different income groups, to be integrated together as well as providing access to employment opportunities, social and recreational activities.

Chapter 5 – Findings

Introduction

This chapter presents the findings of the Housing component of Cornubia, with specific regard to Sustainability, Sustainable Human Settlements and Sustainable Housing. Such information has been compiled into 4 main sections: Cornubia development context, human settlement sustainability, and housing development and interview results. The information within this section was gathered from in-depth interviews with one property developer and current residents involved in the Cornubia Housing Programme, as well as document reviews as secondary research so as to deepen my understanding of the 4 aforementioned sections. Such information will help structure a solid findings base that contains information gathered from multiple sources. Further analysis of such information will be required, defined within Chapter 6.

Cornubia development context

EThekwini Economic Development and Planning Cluster

The Cornubia development is a joint partnership between the eThekwini Municipality and the Tongaat Hulett Development. The need for such a development arose when the large number of informal settlements within the Durban region, put pressure on the eThekwini municipality to provide more low income housing. In 2011, the Cornubia framework plan was set in motion, with a projected timeframe of 20 years.

It is the Economic Development and Planning Cluster of the municipality that oversees the residential component. The Planning department is therefore divided into Strategic Spatial Planning, Land Use Management, Public Sector Housing, and an Information Office sectors. The Planning department, as a whole, therefore aims to plan for sustainability through an integrated planning system. This system comprises of various plans with different scope, purpose and level of detail:

- Long Term Development Framework
- Integrated Development Plan
- Spatial Development Framework
- Spatial Development Plans
- Local Area Plans
- Special Projects
- Land Use Scheme and Precinct Plans

(EThekwini Municipality, 2016:4)

The need for such plans and frameworks are to develop appropriate mechanisms for land use management across the city. Therefore, the integrated planning system involved with the Cornubia Development by the municipality, can be seen as a means of "translating strategic city policy into geographically based sustainable development interventions, through integrated socio-economic, environmental and physical development plans" (eThekwini Municipality, 2016:4). The Cornubia development is seen as a very influential project for the spatial transformation of the eThekwini municipality with regards to planning and development. Diagram 11 depicts a conceptual SDF which defines the planning context of Cornubia, whereby the project builds upon the development shift north of the municipality. From this concept SDF, the eThekwini municipality Planning Department (2016) defined the following Planning objectives for the Cornubia development, which are aimed at:

- Increasing district integration with the surrounding areas
- Creating an integrated human settlement, which include a range of economic and social opportunities coupled with housing provision
- Embracing and ensuring the idea of sustainability through the creation of a framework, delivery and management system that embraces all aspects of human settlement.
- "Building a 'Dynamic Region' whereby the location of Cornubia, within the northern development corridor, enhances and increases the economic opportunities that the location presents" (EThekwini Municipality, 2016:14).

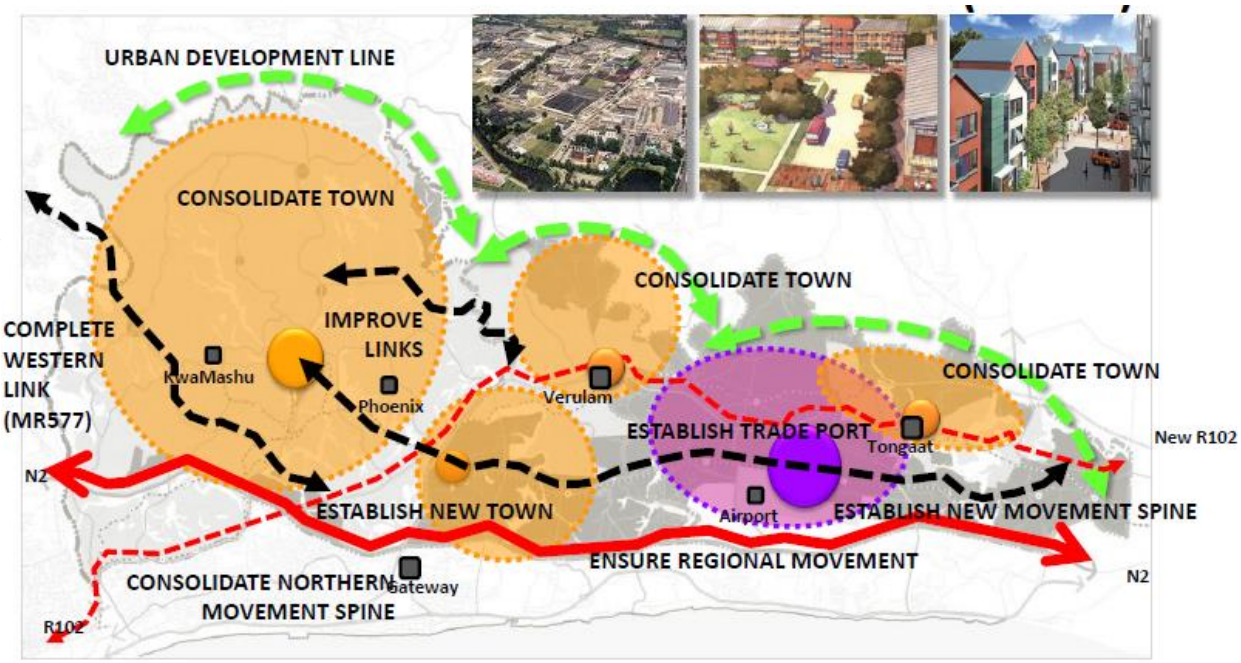


Diagram 11: Conceptual SDF of Cornubia and its linkages to surrounding areas. (EThekwini Municipality, 2016:14)

The morphology of the housing is terraced row housing. The idea behind the morphology and layout of the units is to create a "fine grain walkable residential precinct structured around courtyards and a well-defined streets as a basis for building a sense of community" (Iyer, 2014:12).

Land use schedule

In Chapter 4 above, I mentioned a mix of various land uses proposed in the land use framework. From this framework, the eThekwini Municipality (2016) defined a land use schedule:

Cornubia Framework Plan - Land Use Schedule			
Use	**Income Levels**	**Gross Developable Area (Ha)**	**%**
Medium Density Residential 1- Subsidised Housing	(0-R3500)	161	12
Medium Density Residential 1- Interface Zone	(0-R3500)	17	1
Medium Density Residential 1- Partial Subisidy	(R3501 – R7000)	45	3
High Density Residential 1 (GAP housing – social housing) (Sectional Title)	(R7001 – R15000)	22	2
Mixed Use 1 (High Density Residential + Retail – 80%/20% split) (Sectional Title)	(+R15000)	24	2
Mixed Use 2 (High Density Residential + Retail – 60%/40% split) (Sectional Title)	(+R15000)	24	2
Social Facilities		56	4
General Business (offices, business park, retail and showroom)		186	14
Light Industry, Service Industry and business park		171	13
Servitudes		63	5
Open Space		392	29
Existing		9	1
Future Reserved		22	2
Nursery		4	0,3
Private Cemetery		9	1
Highway Planting		11	1
Roads		115	9
Total		**1303ha**	**100%**

Table depicting Cornubia Land use Schedule (EThekwini Municipality, 2016:14)

Sustainability of Cornubia's Housing Programme

Economic and employment opportunities

There are existing economic opportunities through the Cornubia development (with regards to residential, light industry and commercial development) whereby the development aims to enhance economic efficiency and spatial integration of the eThekwini region. It is estimated by the DoHS (2011) that 43,000 permanent jobs and 387,000 construction jobs will be created, sustained over a 15 – 20 year period. Surrounding the residential development, there is an 80ha light industry

precinct which is currently being developed by Tongaat Hulett Development. Most of the serviced sites within this precinct have been sold to the private sector, for the construction of warehouse, offices and manufacturing factories. From this, there are potential employment opportunities through the construction of these facilities. It is also possible that the private sector might create long term economic opportunities, but it is also possible that the private sector might choose to relocate some of its existing staff from other operation to Cornubia (DoHS, 2011). There are also employment opportunities through the construction of the phase 1b of the housing project.

The partnership between the eThekwini Municipality and Tongaat Hulett Development has also created a potential for economic and employment opportunities for those who benefit from the housing programme. Tongaat Hulett Development created the Socio-economic and Innovative Programme (SIP), in conjunction with the Cornubia Incubation and Empowerment Centre (CIEC), aims at facilitating more economic participation opportunities than there are residents needing them (Tongaat Hulett Development, 2014:4). The key programmes of the development with regard to creating economic and employment opportunities are:

- Youth Development Programme focusing on education, skills and formal employment programmes;
- Jobs Link, profiling and aligning supply and demand;
- Open Space greening, waste recycling, composting, orchards and food security gardens taking advantage of over 400 hectares;
- Private home-based services, like domestic workers, security guards, handyman, garden services, etc.;
- Creating Enterprise development and cooperatives and linking them to business opportunities.

(Tongaat Hulett Development, 2014:4)

The SSIP also noted that Durban faced a multitude of challenges, such as the “eradication of poverty, tenure diversification, urban restructuring and renewal, densification, improved design and quality shelters” (SSIP, 2016:1). But from all these challenges, the SSIP viewed the challenge of unemployment as a priority that needed to be addressed. The SSIP therefore “facilitates the creation of economic participation opportunities and actual placements in excess of current demand” (SSIP, 2016:1). In this way, the development aims to align itself with the United Nations’ sustainable development goal of creating productive employment and decent work for all. Through the facilitation of creating economic opportunities, the programme also aims to progress people from the lower economic strata, with professions such as labourer, bricklayer, plumber, carpentry etc., towards creating SMMEs through enterprise development. In this way, the SSIP “addresses the need

for young people to balance self-development with household livelihood by facilitating education and income (SSIP, 2016:1). Once residents of the housing programme acquire jobs or create their own businesses, the whole residential development will have a major impact on the rate base of Durban, whereby it has the potential to bring in more capital with regards to rates revenue for the municipality.

Social Facilities Framework

A report of Cornubia by Iyer Design Studio (2014) stated that "in the past social facility provision has often led to over allocation of land. This has led to sterile environments being created were social facility sites and land parcels have not been developed and become alienating spaces within communities" (Iyer Design Studio, 2014:8). Therefore, the Cornubia development proposes the creation of a social facilities clusters within the development within its framework. The idea of sharing of facilities "promote[s] a more compact urban form of development" (Iyer Design Studio, 2014:40). Therefore, the social facilities cluster also aims to promote the concept of walkability whereby people do not have to travel far distances to access social facilities. The framework proposes that social facilities, like schools, be within a 5 minute walking distance from the residential area. Along with schools, the social facility clusters also includes libraries, community halls, clinics and sports fields (Iyer Design Studio, 2014:41). Other social/civil facilities such as Police stations, community health centres and Fire Stations have been identified primarily along main routes and at prominent intersections (Iyer Design Studio, 2014:41). Along with the social facilities clusters, the Cornubia Incubation and Empowerment Centre (CIEC), established by the eThekwini Municipality, aimed to facilitate, package and drive the implementation of Social and Economic Development (SED) programmes (KZN DoHS, 2014:8).

As it currently stands, there is a primary school within phase 1a and in 2015 there was a pre-fabricated high school, but now children either walk or take public transport to high schools in the surrounding areas (mostly within the Phoenix and Verulam areas). There is also a lack of health facilities at present within the housing development. Though there are hospitals in the surrounding areas of Phoenix and Bridge City (near Kwa-Mashu), residents do have access to a mobile clinic every second week of the month, but no major health facility is planned within the Cornubia development (KZN DoHS, 2014:8).

Along with the social facilities framework, the Socio-economic and Innovative Programme (SSIP) also facilitates in building a better a society by "localising the inclusive economy and revealing a deeper understanding of sustainable livelihood drivers at lower income levels" (SSIP, 2016:1). In this way, the programme believes that higher employment rates allow communities within the development

to prosper side by side from various economic strata. This is extremely important "in reversing perceptions of lower income neighbours bringing crime, grime and social" (SSIP, 2016:1). Along with helping to create inclusive societies, the SSIP also partnered with the eLangeni TVET College and eThekwini Municipality skills unit to create a satellite campus which offers programmes related to the economic sectors of the surrounding areas, such as commerce, light industry and retail sectors. This aims at better linking community members to employment opportunities by have more appropriate skills and training.

Environmental Concerns

The location of Cornubia allows for the opportunity to "create a viable new east-west and north-south linkage and the integration of peripheral areas into the urban economy" (Naidoo, 2010:13). Therefore, planning and consideration of the development cannot only take into the Cornubia area only as it involves and affects the surrounding areas as well. The development of the Northern Urban Development Corridor (NUDC) also includes the expansion and development of Umhlanga Ridge, Sibaya, Dube Tradeport/La Mercy International Airport, and Tongaat areas (Naidoo, 2010:13). Therefore considerations of the environment cannot only occur area by area, rather how each development within each area affects and influences each other.

Another environmental consideration of the housing development is a 40m buffer which has been observed from the 100 year flood-line on site, with no development is proposed within this buffer. The same applies for the on-site and surrounding wetlands and drainage lines. Apart from these considerations, there are numerous vantage points and ridges which serve as an opportunity for the development (Iyer Design Studio, 2014:24). Another environmental consideration is the Flanders Quarry which is on the southern corner of the development. This quarry has resulted in an existing landfill stockpile. Both the quarry boundary and the associated landfill site are deemed undevelopable. According to the project engineers, the undevelopable areas can be used for open space, parks, and sports fields (Iyer Design Studio, 2014:26).

The Socio-economic and Innovative Programme (SSIP) of Cornubia also aims at creating open space environmental rehabilitation and restoration by engaging with local farmers. There is partnership formed whereby the farmers knowledge of the environment and how to sustain it, is exchanged for the consent to farm on a small footprint within the development. The farmers teach community members how to conduct 'urban organic farming' so that the community members can farm and sell their produce. "This programme ensures that older African female community members (Gogo's) who may not be employable formally" can sustain a living for their families (SSIP, 2016:1).

With regards to environmental alternatives, a 'No-Go' option of restricting development was considered within the EIA of Cornubia, whereby there would be a retention of the previous land use of agriculture (Naidoo, 2010:13). But this alternatives was turned down as the Cornubia development has a large housing development. If a 'No-Go' option of development was to occur it would restrict the positive impacts of having a large housing development. Therefore, "this option does not facilitate integration and it does not address the housing backlog and opportunity to redress the spatial planning imbalances of apartheid" (Naidoo, 2010:13).

- Open Space Structure (OSS)

Given that the "open space which comprises almost 29% of the site, careful consideration was taken to ensure that open space within the design that allows for continuity for habitat and for recreational purposes" (Iyer Design Studio, 2014:8). As stated previously, the site considerations for the development showed that the wetlands, drainage lines occupies approximately 29% of the site. Therefore the Open Space System was established "through the creation of additional new 'green' linkages adopting the existing valley systems, wetlands and their buffers and steep topography as a basis. Apart from adopting the existing constraints, additional open space has been created through the design by creating more defined open space within certain portions of the layout" (Iyer Urban Design Studio, 2014:28). The OSS has been incorporated within the Cornubia Framework Plan and will materialise within the development of Phase 1. The reasoning behind the OSS is to consider and preserve important wetland crossing areas where roads transverse over these areas. The system put in place aims to transform such areas into buffer zones. "A 10m rehabilitation zone on either side of the buffers are retained for indigenous vegetation. The remaining areas within the buffers, may be conducive for agricultural productivity which could be used for small scale market or community gardens. In this way, the development is utilising the green space for recreation as well as for local production" (Iyer Urban Design Studio, 2014:28). In total, the OSS will constitute approximately 44% of the total study area for Phase 2, which includes:

- Open Space (Wetlands, Floodplains, including their buffers) : 309ha
- Open Space (Servitudes that can be considered as open space): 55ha
- Highway Planting: 17ha
- Park/Play lot: 11.5ha

<u>Transportation</u>

A significant aspect of the overall Cornubia framework focuses on "district integration facilitated through the proposed higher order routes within the framework" (Iyer Design Studio, 2014:8). A

focus on public transportation is a key priority for the Cornubia development. The proposed Blackburn link road and Dube West have been identified as primary arterials and connect with places of significance within the region. Cornubia Boulevard East and Dube West have been identified as Priority Public Transportation routes intended to serve the Cornubia development as well contribute to the overall planning vision for the north.

In 2014 president Zuma announced that the city's new proposed Bus Rapid Transit (BRT) system will occur within the Cornubia development once more housing phases have been completed, thus linking the development to areas such as Umhlanga, Phoenix, the Dube Trade Port and the King Shaka International Airport. The BRT system is part of the Integrated Rapid Public Transport Network (IRPTN) called Go!Durban, which is a new transport project. This city wide project aims to link rail systems to BRT system, road, pedestrian and bicycle facilities, thus creating a public transport solution which will eventually comprise nine transport corridors, placing any area in Durban within 10 minutes' walk of a transport node (SA Property Insider, 2016). The way in which this proposed system directly affects the sustainability of Cornubia's Housing Programme and the development as a whole is through the Transport Orientated developments (TOD) sites proposed within the development. The TOD sites are planned to be placed at key intersections (and where BRT stations have been proposed), approximately 400m from one another (Iyer Design Studio, 2014:40). "The TOD sites have been located so all key local access roads connect with them. This ensures that there [is] adequate coverage across the entire development and they are easily accessible" (Iyer Design Studio, 2014:40). The purpose of the TOD sites is to help create a public transport network that has an adequate threshold (from residential and retail/commercial developments) thus are able to sustain and support the operations of the BRT. Once the other phases of the housing programme are completed residents will be able to easily access various areas around the city, thus creating a development which maximises choice.

Housing Programme and Development

Phase 1a

As stated previously in Chapter 4, the project will be implemented in different phases, which will be rolled out over a 20 year period. The total aim of the residential programme of this development is to deliver 24 320 subsidised units. The Housing programme also aims to deliver public open spaces (such as gardens, parks and the OSS). Construction of Phase 1a has already been completed and the majority of the 486 units are already occupied. The units are 50m2, double storey attached. The

units are arranged around a common courtyard with the intention of landscaping the streets and local parks (Iyer Design Studio, 2014:8).

Funding

The total cost of the whole Cornubia project is estimated at R25 billion. With regards to housing, the Phase 1 housing will produce approximately 5000 houses. On the 22 May 2010, the MEC for Human Settlements and Public Works approved the housing project, whereby there was a provisional allocation of 5000 subsidies for the Cornubia Phase 1, as a new Integrated Residential Development (IRDP).

In 2011, the DoHS calculated the total provisional cost, as of 2011, for the housing project, which came to R389 340 000.00 (R 77 868.00 x 5000 sites). The total provisional cost included 3 funding phases, as well as the cost to acquire the land needed, whereby:

1. Stage 1: funding at R1 062 590.40 (R 2 186.40 x 486 sites), in order to undertake planning, engineering design and NHBRC enrolment.
2. Stage 2: funding amount of R9 708 141.60 (R19 975.60 x 486 sites), for subsidies and services
3. Stage 3: at the time, there was an application put forward for the funding of Stage 3, which accounted for construction costs of the houses. This amount was to be approved at a later stage. Refer to the table below.
4. Land acquisition: The Department has thus far paid an amount of R 366.777.190.00 for land acquisition.

(DoHS, 2011:2-3)

Obtaining a subsidised house

It must be noted that the eThekwini municipality did not identify specific people as beneficiaries. There was a process of obtaining a subsidised house, but this was through an Allocations Guideline Document for Phase 1a set out the criteria for the selection of targeted informal settlements and beneficiaries. People within such areas would have had to apply for a subsidised house. The Cornubia allocations guideline was set up by the eThekwini municipality, which attempted to accommodate the most vulnerable people within informal settlements throughout the City. Families not accommodated in Phase 1 could be accommodated in future phases of Cornubia or other Projects within the eThekwini Municipality. Beneficiaries of the subsidised housing needed to meet qualifying criteria set up by the KZN Department of Human Settlements (as highlighted in chapter 2)

Beneficiaries were also cautioned against the following transgressions and pitfalls when applying for a house (eThekwini Municipality, 2010:2):

- Do not allow your dependents to be used by other beneficiaries for application of a housing subsidy.
- Do not use other dependents for your own housing subsidy application.
- Houses are allocated to qualifying beneficiaries by the officials of the eThekwini Municipality, Human Settlement Unit, and Allocations Department.
- Houses are not sold to beneficiaries – do not allow yourself to be conned or transact illegally

Once beneficiaries have met the criteria, they were then allocated a house. Upon receiving a house, the boundary pegs are shown to beneficiaries and this assists the beneficiaries in acknowledging the extent of their properties. Beneficiaries were urged not to remove the pegs, and also not to fence their houses before they are shown these pegs. Once the beneficiaries have received their house, they were told that the Cornubia Development will not be permitted to extend their houses as the design of the housing units is not suitable for this (eThekwini Municipality, 2010:2).

With regards to the selling and buying of low income housing, the beneficiaries have to sign legal document /forms, as was the case with previous RDP housing. In those forms there is a 'pre-emption clause'. The purpose of the clause is to make people aware and agree that they will not sell those houses before the agreed period of 5 years upon receiving their title deed. If it happens that a person has to sell the house before the specified time period, that house must be handed to Government first. Anyone who buys an RDP house without a written document, and approved by Government, buys that house illegally. The implication is that that house cannot be transferred to the new buyer because the sale agreement did not follow the formal legal requirement and it has breached a pre-emption clause by the owner (eThekwini Municipality, 2010:3).

Interview Results

Residents

In order to further understand and evaluate the sustainability of the Cornubia Housing programme, with regards to sustainable human settlements, interviews were conducted with 4 Phase 1a residents. Each of the residents have been staying in Cornubia for more than 6 months. Interviewee 1 was an elderly Black man, who obtained a subsidised house after staying in an informal settlement in Clermont. Interviewee 2 was an Indian man who lives with fiancée and her extended family. Interviewee 3 was a Black woman who runs a tuckshop from her house. She had obtained her house due to her 13 year old son's disability. Interviewee 4 was a Coloured man, who obtained a house after being previously homeless. The reason for interviewing such people is due to their direct

relation to the development, so as to gain a hands-on experience of the Housing Programme. Each of the residents have different backgrounds, experiences and needs. The information discussed within both sets of interviews revolve around sustainability, sustainable human settlements and sustainable housing. The interview results have therefore been compiled into 4 main sections, viz. economic sustainability, social sustainability, environmental sustainability and transportation.

- Economic sustainability

With regards to economic sustainability, residents were asked questions around costs to maintain the household, access to economic opportunities and economic value of the house to their livelihoods. When asked about the running costs of the household, with regards to water and electricity bills, the average cost ranged between R300 to R400 per month for utilities. Each of the residents did express that electricity costs are more than it is for water. It must be noted that 2 of the households have extra people renting rooms in their houses, over and above other family members. Some residents complained that pipes sometimes leak, but they are able to fix the pipes. The biggest issue with regards to utilities are the electricity connections. Interviewee 4 expressed his extreme discontent that when there are power failures, the electricity boxes are sealed with a lock (for which he does not have a key). This results in the municipality having to come and restore connections, which only occur a day or two after the initial power failure. For interviewee 4 this has resulted in food being thrown away due to spoilage. Along with the cost of utilities, interviewees were asked if they had any knowledge of cost-effective building materials used in either the building or running of the house. Each interviewee had no knowledge of such. They stated that they had no knowledge of any recycled or energy efficient materials used within the house. They all stated that when they moved into the houses, there were no light fittings, resulting in them having to buy the fittings and lights themselves.

With regards to access to economic opportunities, 3 of the 4 interviewees did not work. Interviewee 3 has a tuckshop that she runs from her house. She did state that having an informal tuckshop was not allowed, but many people do it. She cannot work away from home due to her son's disability. She stated that she wanted to extend her house to provide more room for the tuckshop, but she was unable to do so as extending or altering the property was not allowed. This effects the sustainability of the programme. By having conditions that restrict the editing of houses, it restricts the growth of small businesses, thus negatively impacting the livelihoods of such people as they are not able to sustain an income. However, residents are allowed to pave the outside of their yard and put up awnings. Interviewee 1 stated that he was an artisan by trade and that he could not get a job with regards to the development of Cornubia. He stated that even though there are many jobs available with the contractors working on the housing programme development, he has been unsuccessful.

When asked about the economic value of the house to their livelihoods, the respondents were slightly confused. But the general consensus was that having a house means a lot to them and their families. The interviewees stated that many other residents of Cornubia's Housing Programme came from either informal settlements or impoverished communities, therefore such people are happy to have appropriate shelter. To identify a more fiscal understanding of the question, an example of acquiring a loan from a bank and using their houses as collateral was used. Interviewee 1 and 2 had reservations when answering the question. But interviewee 3 and 4 both stated that nothing can be done with the house within 5 years of obtaining the house. It is only after 5 years that the residents receive title deeds for their house which can be used as collateral for loans. Over and above the 5 year waiting period, residents also have to abide by certain rules and regulations. If they contravene any of the rules and regulations, it is possible that they might not receive title deeds. One such rule was that they were not allowed to rent or sell the house before obtaining a title deed. However, given the reality of the residents that were interviewed, this rule does not seem sustainable

- Social sustainability

The residents were asked questions related to safety, crime, social facilities and recreation. The general consensus of all the interviewees was that Cornubia was very safe. In February 2016, there were housing invasions that occurred in the area. The 'invaders' consisted mainly of people who had been waiting for houses, but had yet to receive one. When interviewed, none of the residents stated that they had been affected by the home invasions. None of the residents had been affected by any crime whatsoever. With regards to health care, all residents expressed their discontent for not having direct access to the Mahatma Ghandi Hospital in Phoenix. To access this public hospital, people have to take a taxi from Cornubia to Verulam, thereafter taking a taxi to Phoenix. This was particularly relevant to interviewee 3 who has a disabled child, as the mobile clinic services are limited. Interviewee 4 also stated that the structure of the house was not conducive to older people, as the stairs to the 1st floor bedrooms were very steep and that many people struggled to walk up. However, interviewee 3 stated that she had no problem moving her disabled son around the house as he is still young. With regards to educational facilities, interviewees noted that there was a primary school on site, but children who are in high school have to go outside of the area. With regards to recreation, all interviewees were very happy with the 'mini parks' on site and stated that the children in the area use it a lot.

- Environmental sustainability

The residents were asked questions related to water, waste and energy efficiency. None of the residents had any knowledge of water or energy efficient practices used within their households. Interviewee 2 stated that there are no solar heating, nor any energy efficient light bulbs provided.

They had to put in their own bulbs when they moved in. As stated previously, some residents stated that some water connections did leak, but they were able to fix these. Durban Solid Waste (DSW) picked up refuse on a weekly basis. No residents had any problems with the refuse collection. At the same time, none of the residents conducted waste recycling in their own homes but interviewee 3 stated that a neighbour of hers collects and recycles glass bottles in large quantities, which he sells and earns an income. Interviewee 4 highlighted the fact that none of the houses have gutters. When it rains, the topography of the area results in the runoff causing problems for some residents as there are no channels to catch the runoff. He stated that many times, water did seep into his house when it rained.

- Transportation

Every interviewee expressed their dislike for the current transportation network. If a resident of Cornubia wanted to access Phoenix, which is approximately 7 km away, they would have to either take a taxi to either Verulam (4.5km away) or the CBD (24km away); then take another taxi to Phoenix. The same applies for access to the Gateway Theatre of Shopping which is a popular mall, which is approximately 5km away. A taxi to Verulam costs R10 and a trip to the CBD costs R15. Interviewee 3 stated that she would be very happy if the buses came through the area.

<u>Property developer from Tongaat Hulett Development.</u>

The subject matter asked within the interview were questions surrounding the progress of aspects within the 2011 Cornubia Development Framework. She stated that since the framework was established, the phase 1 of the project is currently under construction which consists of government subsidized housing phase 1 a & b and also the Cornubia Industrial and Business Estate (CIBE) which all sites have been sold to light industrial/warehousing companies. The phase (1b) will deliver 2136 units in total. Phase 2 which is in the planning stages will cater for other housing options such as Social Housing. She went on to state that the Cornubia retail park is also sold out and that the construction of a shopping mall will be completed and opened September 2017.

The vision of the Cornubia housing programme aims at “moving housing beyond the provision of shelter toward creating decent living environments with a sense of community, dignity and pride” (Iyer Design Studio, 2011:4). The development of Cornubia is still within early phases, therefore it is hard to measure/define how close the development is to achieve the aforementioned vision. However, a Socio-economic and Innovative Programme (SIP) has been established with a slogan of 0% unemployment in Cornubia. The SIP aims to assist residents in need by linking such residents of Cornubia with employment opportunities in construction and the light industries/warehousing factories that are operational. Tongaat Hulett Development also in collaboration with Wildlands

offer training for environmental, gardening and landscaping purposes. There are programmes in place where gardening co-operative have been created and are operations. They supply fresh produce to Spars in the Umhlanga area. These are just some of their initiatives aimed at achieving the vision.

The development has many elaborate future projections with regards to mixed land use and creating an integrated human settlement. But funding is one of the main challenges as it is also aligned to the political stand and the economy of the country. This is a project that will extend to over 25 years. A lot can change dictated by the market and the political stability of the country however the framework guides the development. That is the framework that has been approved in terms of land uses.

However, given what is proposed for Cornubia and what has been implemented, the housing programme can be considered somewhat contradictory. When interviewing the developer, I had made mention of the difficulties that the residents have experienced. The developer explicitly stated that Tongaat Hulett Development is not responsible for the planning associated with the housing programme. The TGD is only responsible for the construction of the houses (top-structures). It can be argued that the development is currently unsustainable and places the residents under strain, given the lack of services and facilities at the present moment.

Conclusion

The findings in this chapter have started to highlight aspects of the Cornubia Housing Programme by describing the context of the development, human settlement sustainability and the Housing development. In the case of Cornubia, the eThekwini Municipality's planning department has made great strides to provide quality housing to those in need. The aim is to develop not only Cornubia, but create and link Northern development within Durban as a whole. There are so many factors to consider when trying to create a sustainable human settlement and sustainable housing. Aspects such as the social facilities framework, economic opportunities and OSS assist Cornubia in becoming a sustainable human settlement. With Regards to the Phase 1a housing, residents have a particular stance on the development with regards to what they need, as compared to what is provided. They appreciate the fact that they have a secure roof over their heads, but they feel as if they are lacking certain attributes, services and facilities which could make their lives and houses more sustainable. Given that the development is within planning and implementation phases, the idea of creating a sustainable human settlement and sustainable housing presents both opportunities and challenges, and this will be discussed further in the following chapter.

Chapter 6 – Analysis of Findings

Introduction

This chapter investigates the findings of Cornubia's Housing programme in relation to sustainability and sustainable human settlements. The analysis of the programme will be defined within 3 dimensions: need, implementation and outcome. The process of this analysis relates to the conceptual framework developed in Chapter 2 whereby concepts, plans, policies and strategies have influenced the outcomes of the housing programme. The analysis of the findings firstly aims to understand the cause of the Cornubia Housing development. Secondly, the analysis aims to identify whether the implementation of the Phase1a has assisted Cornubia in becoming a Sustainable Human Settlement. Given that the Housing programme is still within early phases of implementation and development, the analysis will highlight any possible Housing Programme outcomes with regards to economic, social and environmental aspects. Finally, the analysis will define limitations and opportunities of the Housing programme.

Justifications for Cornubia development

Need for low income housing

The eThekwini Municipality and Tongaat Hulett Development partnered together to develop a human settlement that had a mix of land use, as opposed to housing provision. This builds on the Integrated Residential Development Programme (IRDP) which aims to accelerate the development of human settlements in well-located areas that will provide easy access to urban amenities such as schools, places of employment, etc. The housing programme was influenced by the realisation that low income settlements were continuously being built in the urban periphery with no provision of social and economic amenities. The cause of the development went beyond the need to provide housing, but rather create a human settlement that embodied concepts of sustainability, integration and ultimately creating a better life for all. By creating such a space, it does not only affect residents of the development, but it was aimed at enhancing the development of Durban's Northern Corridor, thus effecting many other people and areas within the municipality as a whole.

Government and THD engagement

The development of the Housing programme has been undertaken by the eThekwini Municipality's Economic Development and Planning Cluster. This cluster has put in place several integrated planning systems, which look at Cornubia in relation to other areas and developments around the

city. The key principles and objectives of the system is to drive spatial restructuring of the City, by promoting equity, efficiency and sustainability. This is aimed at recognising and address historical imbalances through spatial restructuring, whereby there is a clear pattern of where, and what type of growth, will occur (eThekwini Municipality, 2016:7). This is of utmost importance, because developments like Cornubia cannot operate and function in isolation. The municipality has also partnered with Tongaat Hulett Development (THD), who are developers. The THD is well versed in developing urban and rural areas. This partnership is mutually beneficial, as one cannot survive without the other. The residents from the housing programme will benefit from both the industrial and commercial components of the whole development; at the same time, the construction of the commercial and industrial park (CIBE) needs both work force and threshold that the Housing component offers.

One must note that the Cornubia Housing Programme was conceptualised in 2004 and the implementation process commenced on 28 July 2010 and was finalised in March 2014. As development continues, there is a chance that there can be deviations from the original plan.

Cornubia Development Framework

In 2011, both the THD and eThekwini municipality defined a development framework. It is here where the nuances of sustainability and sustainable human settlement occurred. The framework boasts various plans and strategies associated with both the housing component and mixed land use development. From this framework, only Phase 1a of the Housing Programme has been developed. The other phases are still to follow. But this has caused a few problems for the efficiency and sustainability of Phase 1a. Firstly, the proposed TOD network will materialise fully only when the later phases of the Housing Programme are developed. Currently, residents have to rely solely on a few public transportation networks in area. Secondly, the aspects of the open space system have been put in place for Phase 1a. The realisation of the entire OSS, like the proposed TOD, will only fully materialise when the other housing phases have been developed. The same goes for the proposed social facilities cluster.

The framework also identified certain challenges to the development, such as environmental considerations. The poor topographic and geo-technical conditions have posed problems for the development. The reason for such conditions was due to the previous agricultural practices, i.e. planting and harvesting of sugarcane.

Has the implementation of Phase 1a assisted Cornubia in becoming a SHS?

To be considered as a sustainable human settlement (defined in detail within Chapter 2), a development needs to comprise various aspects. One main aspect is that of housing. The efficiency and sustainability of housing does aid a human settlement in becoming sustainable, but it is not the only aspect, though it does play a major role. This can be seen when analysing the economic sustainability in relation to housing location; environmental sustainability of housing through the BNG and the EIA; and social sustainability through the current and proposed social facilities. These sustainable practices and possible outcomes are very important when assessing if the implementation of the Phase 1a assists Cornubia in becoming a sustainable human settlement, but the residents' portrait of housing and sustainability also helps answer this question.

Sustainable Practices

In terms of economic sustainability, the Cornubia Housing Programme can be seen as financially viable since it was allocated R26 billion by government for its development. It is also in close proximity to the CIBE, which also increases employment opportunities for the beneficiaries of the housing programme, enabling them to pay for services such as water, electricity and school fees. The housing programme also addresses skills shortages and job opportunities through the Socio-economic and Innovative Programme (SIP). The aim of this programme is to ease access to employment opportunities. This allows the beneficiaries to be in a position to pay for services they receive from the eThekwini Municipality, such as water and electricity (KZN HS, 2014:9). Such a situation (whereby residents have access to increased employment opportunities) helps to develop the economic base of the residential area. Residents will be able to enjoy a better quality of life. The possible increase in jobs of the whole residential development will have a major impact on Durban, whereby the potential to bring in more capital with regards to rates revenue for the municipality allows the municipality to be able to fund more housing programmes that benefit more poor people.

The environmental sustainability of the programme can be seen through its relation to the BNG, whereby the policy advocates for the good management of settlements in which economic growth and social development are in balance so as to not impact negatively on the capacity of the natural systems. By creating such a balance, it results in sustainable development, wealth creation, poverty alleviation and equity. The aim to create such a balance can be seen with regards to the proposed framework which promotes the integrating of various land uses, public transport planning, mixed land use development, facilitating higher densities and more compact urban form in order to ensure more responsive and diverse environments, while reducing travelling distances (BNG 2004). In order to maintain the balance between the development and the environment, the housing development

faced challenges due to the undulating topography of the site. This lead to an increase in 'cutting' and levelling out of sites for development, so as that the development does not encroach on the natural system. Along with this, and the OSS (once fully implemented), the preservation of the natural systems leads to a decrease in the overall carbon footprint of the Cornubia development. It must be noted that an EIA has been approved for the Cornubia development. The purpose of the EIA is to gain a record of decision as to whether development is allowed on the proposed site or not (NEMA, 1998). On this basis, within the EIA, various specialist studies have been undertaken to ensure that the practices of the development occur in a sustainable manner.

The Social facilities cluster can be seen as another form of social sustainability, but unfortunately the clusters will only occur after the implementation and development of other housing phases. It is therefore hard to judge whether this aspect can help Cornubia to achieve sustainable housing status. But the selection process of the beneficiaries can be seen as a form of sustainability, whereby the eThekwini Municipality established eligibility criteria. The success of the programme is the result of the "presence of well-established eligibility criteria, the feasibility of reaching eligible people and effectively serving them, and the willingness of potential clients to become committed to or cooperative with the programme" (Chen 2006:77). As it currently stands, the limited of access to health care and educational facilities (schools and libraries) on site result in many residents having to travel to surrounding areas to access such facilities. This situation is unsustainable as the residents of Phase 1a have to spend extra time and money to travel to different areas. It is unfortunate that the current threshold of residents are not nearly enough to sustain social facilities like educational and health care facilities.

Residents' portrait of housing and sustainability

As stated within the findings, the residents who were interviewed did not fully understand what was meant by sustainable human settlements therefore they were not able to fully express what they views on the matter were. However, they were able to answer and pin-point issues related to sustainable housing and transport.

With regards to economic sustainability of housing, residents seemed impartial to the cost of utilities. Some did state that the cost of electricity is higher than that of water. There are 2 main reasons for why the cost of electricity is more than that of water:

- Firstly, all the residents who stated that their electricity bill was high had more than the average number of people staying in their houses. Many residents have rented out rooms to people. It is possible that this may be the reason for higher than normal electricity bills.

- Secondly, there are no visible or apparent water or energy efficient practices used within their households. For example, there are no solar panels on the houses, this then results in more energy being used for heating and bathing.

The fact that there are no energy saving practices and a higher occupancy of some houses reduces the sustainability of the housing programme.

With regards to social sustainability, all residents feel that the area is safe and that they have had no incidents of crime. However, access to social facilities like health care and education are seen as a problem. Though there is mobile clinic that comes onto site, residents would rather go to state hospitals for more thorough/specialised treatment. The fact that the phase 1a is a pilot programme, such social deficits should be rectified once more housing phases have been implemented, thus creating a high enough threshold to support social facilities like schools and clinics.

With regards to environmental sustainability, there are no sustainable practices associated with the houses nor the upkeep and maintenance of the house. Residents were unhappy with the fact that they had to install their own lights when they moved in. Not having any energy efficient practices within the households creates an unsustainable situation. One can argue that the onus of using energy saving light bulbs, for example, is placed upon the residents, but one must understand that most residents of Phase 1a came from impoverished communities and informal settlements. They therefore have no knowledge of such sustainable practices. Another issue with environmental sustainability is the fact that none of the houses has gutters. This poses a problem of rainwater run-off and no harvesting of rain water. Residents complained that there are no drainage measures put in place to channel water. This may pose environmental risk in the future, such as soil erosion. If this situation occurs, more money and time will be spent fixing the problem, whereas the human resource and capital could be better spent if the situation was handled better from the beginning.

The current standing of the development can be argued as unsustainable. Even though the EIA states that the development practices in Cornubia are done within a sustainable manner, there are many contradictions to the sustainability of the development at the present moment. Though the policies and strategies for the development advocate for efficient public transport, the reality of residents' lives paints a different picture. The fact that the residents have to rely on an inefficient transport clearly shows that the development is not sustainable at present moment.

Possible Housing Programme outcomes

This section analyses the possible sustainable outcomes of the housing programme that could assist Cornubia in becoming a sustainable human settlement in future. The possible sustainable outcomes are access to economic opportunities, social, environment and transport.

Access to economic opportunities

As it stands, the physical access to economic opportunities through transportation and mobility is limited. The majority of residents do not own a car, therefore they currently have to rely on public transportation, which at times is limited. The inefficiency of this situation limits the level of sustainability of the Housing programme as people will not be able to physically get to their jobs, if their jobs are outside of Cornubia. If they are unable to have a job, they are not able to provide for their families, which in turn negatively effects their social and economic wellbeing. But there is opportunity for this to change. Cornubia has proposed a TOD programme which aims to incorporate a BRT system within the residential areas. If this is to occur, it increases access to economic opportunities both from within the residential areas as well as the surrounding areas. This will then increase the economic base of the whole development, which can lead to increased development and growth. Another factor that enhances economic opportunities in the future, is the access to jobs once the Cornubia Industrial and Business Estate (CIBE) has been established, it has the potential to provide more jobs for residents. Once more residents acquire more jobs, each of the residents will add to the rates and tax base, thus leading to increase economic and fiscal base of both the Cornubia development and the municipality as a whole. Such a situation enhances the sustainability of the development with regards to helping those without jobs/income. The increased income of rates and taxes will allow services to be maintained for those who cannot afford to pay for such services. Within future housing phases, the development aims to integrate people from different income strata. If this occurs, it is possible that those who earn higher are able to contribute more towards the rates base of the development. Another way in which the increased access to jobs affects those within the Housing Programme is the idea of working locally. From the interviews with the residents, it can be seen that some rent out rooms in their houses to sustain an income as they do not have jobs. If such people had more access to job opportunities within the Cornubia development, it would eliminate the need to rent out or sell houses. (SSIP, 2016:1)

Social

As it stands, residents of Phase 1a have limited access to educational and health facilities. Once the proposed social facilities clusters have been implemented, there will be many positive knock-on

effects. Firstly, the clusters are to be implemented within close proximity to residential areas within the development. This increases the walkability of the housing programme, as people do not need to travel far distances to get health care, education, recreation, etc. Residents will therefore not have to waste money and time on transportation to outside areas to access the same facilities.

One of the main goals of Cornubia and its Housing Programme is to create an integrated community, whereby various people from different races, backgrounds and economic status are able to live together and interact with each other. This idea of creating an integrated community allows for people to learn from, accept and understand each other. Such a situation helps to resolve problems created during apartheid, such as racism and segregation. “In this way the state will achieve a means toward a more inclusive city which is the ultimate aim of the BNG policy” (Khan, 2014:96).

Environment

The proposed OSS, once more housing phases have been completed, will increase the environmental sustainability of the development. It will allow for areas to be preserved, but at the same time maintain the balance between human activities and the presentation of the environment. The proposition of both increased green linkages and more open spaces enhance the level of green spaces within the development, thus allowing for potential of more recreational activities to occur.

Transportation and mobility networks

Over and above transport assisting the growth of the economic sector by linking the development to various areas, transportation affects the environmental well-being of the area. The proposition of incorporating TOD sites and the BRT system within the Cornubia development helps to reduce the carbon foot print of the development as there would be less cars within the development as people would make use of more public transport. The reduction of cars also leads to a reduced size of foot print needed for parking. This enhances the sustainability and efficiency of the development with regards to land utilization. For example, the land that the parking would take up, could be used for more commercial or social uses. The proposed TOD sites also affect the livelihoods of informal traders. The SSIP (2016) highlighted that informal trading is promoted within the development and that such activities are more likely to occur where there are a constant flow of foot traffic, such as the public transport areas i.e. BRT stations, depots, drop/off pick up points (SSIP, 2016:1). Unfortunately, the lack of services, like an efficient transport system creates a contradiction to the sustainable practices, strategies and plans for Cornubia. The reality of residents at the present moment with regards to the lack of implementation of many facilities and services, results in an unsustainable environment. It can be argued that the current situation of the housing programme

puts strain on its residents as compared to helping them and creating a better living environment for all.

Conclusion

This chapter analysed the findings related to Cornubia with regards to the creation of sustainable human settlements and sustainability. The eThekwini municipality aimed to solve the housing challenge in Durban by providing housing for people from lower socioeconomic strata and bringing them closer to employment opportunities by systematically aligning various financial, human, institutional and managerial resources in order to improve provision of service delivery (Tongaat Hulett Development, 2014:1). Due to the fact that only the Phase 1a houses have been completed, there are many limitations experienced by the residents, but this is to be expected. Once more housing phases have been developed, the more economic opportunities, social facilities, environmental sustainability potential and transport efficiency will be possible. The CIBE has the potential to create approximately 43 000 new sustainable jobs and 387 000 short-term construction jobs over a 15-year period. There are three light industry factories that were completed in 2014 and four more were completed in early 2015. This increases the economic opportunity of the development. The social facilities cluster that has been proposed within the Cornubia framework will allow for more residents to access healthcare and educational facilities. However, the lack of sustainable practices used in the development and maintenance of the Phase 1a houses poses serious problems to the level of sustainability that other housing phases can achieve. The reality is that the residents interviewed have not benefitted for any innovation programmes that the housing programme has to offer. They therefore need to find other means to sustain their livelihoods, such as tuckshops and renting rooms. The fact that they are willing to go against their deed contracts shows that there is a need that is not being met. Another reality is the lack of services that are available, in the form of transportation, education and health care access. What has been proposed and what has been implemented are two contrasting realities. Though the housing programme has been able to provide people with shelter and some services, it can be argued that the residents who have been interviewed suffer other strains from the housing programme. Therefore, housing programme, at its current status of development, is unsustainable.

Chapter 7 – Conclusion

In 1998, NEMA defined what is required for sustainable development to occur within South Africa. This policy set the tone for future policies with regard to creating sustainable development. However, the principles defined within this policy mainly identified environmental aspects to consider within development. One of the biggest issues a majority of South Africans faced was lack of access to adequate housing. This resulted in the 1994 White paper on Housing aimed at delivering 350 000 houses per annum in order to eliminate housing backlogs through the Reconstruction and Development Programme. However, many criticised this Programme as there were many inequalities that it promoted as compared to addressing such inequalities (Donaldson, 2001; Mokgalapa, 2012; Huchzermeyer, 2003). Therefore, in 2004, the BNG policy was introduced. "The BNG policy is based on the principles contained in the White Paper on Housing and outlines the strategies to be taken to achieve the government's overall housing aim" (Tissington, 2011:21). The policy aimed at creating sustainable human settlements as opposed to housing provision whereby emphasis was placed on creating a better lives for people through settlement development that encompassed principles such as addressing environmental challenges, generating economic empowerment, enhancing social capital and building institutional capacity. Adding to the need for sustainable development, in 2008, the Department of Environmental Affairs (DoEA) defined a National Framework on Sustainable Development, building on the principles of NEMA (1998). The framework understood that for sustainability to be created within development, social, environmental and economic aspects related to a development need to be amalgamated together and integrated within government system.

This research also engages with other polices and strategies that aim to mitigate the inequalities and injustices created by the Apartheid government. Predominant focus on the BNG policy within this research was due to the fact that this policy promoted the creation of sustainable human settlements, as it addressed the need for sustainable and equitable development within housing development. However, even though there are strategies and policies that are put in place to create sustainable human settlements and promote sustainable development, South Africa still faces many housing challenges. It must be noted that government has made many head-way with regards to providing housing, but the provision of housing is no longer enough to sustain people's lives.

Therefore the research focused principles and practices primarily on the creation of sustainable development, sustainable human settlements and sustainable housing. In order to fully understand these types of developments, the research adopted 3 main concepts that encompass sustainability, viz. economic, social and environmental sustainability. As seen in previous chapters, these concepts need to be integrated together, no independently, so as to allow for the development of settlements

to occur within a more sustainable manner. The research looked at literature written about theses major concepts, and how these can be used to create sustainability.

The reason why the research defined sustainability in this manner, was to understand the context of the Cornubia integrated human settlement Case Study within this research. The KwaZulu-Natal provinces suffers from many informal settlements, therefore the eThekwini municipality defined a housing project, in conjunction with Tongaat Hulett Development, to provide different housing typologies for people across different income groups. The eThekwini municipality is responsible for the planning and delivery of housing programme of the development. This section of the research will define the three concepts of sustainability with regards to the housing programme of Cornubia and its relation to the entire human settlement. This will give insight into answering the research question and sub-questions. However, before one can begin to investigate the sustainability of the housing programme in relation to sustainable human settlements, it must be noted that Cornubia is within the early stages of development. Though the initial idea for Cornubia started in 2004, specifically the phase 1a of the housing programme was only constructed in 2010. The housing programme aims to create approximately 25000 units in several phases, but only part of the first phase is complete. The repercussions for this research, given that it investigates the housing programme, with regards to only assessing a portion of the housing programme results in limited data. As it stands, there are plans in place for certain facilities and strategies to be implemented (discussed further in this chapter), however, a conclusion of the level of sustainability of the whole development cannot be assumed or generalised given the first phase of the housing programme. The research aims to understand what sustainable practices are used within the first phase of the housing programme with regards to sustainable development and sustainable human settlements, and what can be learnt from the first phase and possibly continued/discontinued within the other phases. Therefore this chapter highlights the sustainable practices of the Phase 1 a housing and discusses the future development of the next housing phases projected within the housing programme. In this way, the research is able to pick-apart which practices truly encompass principles of sustainability and highlight those practices that are not.

By doing so, this section aims to conclude the research by answering the research question:

How sustainable is the Housing Programme of Cornubia, with regards to creating Sustainable Housing and Sustainable Human Settlements?

What sustainable housing initiatives have been envisioned for and implemented within Cornubia, specifically the Housing Programme?

The housing programme of Cornubia aims to yield approximately 25000 units which will be developed in several phases. Cornubia offers a variety of economic, social and environmental sustainable initiatives for those who/will be part of the housing programme. But the current situation regarding each initiatives is as follows:

- Social Sustainability

As stated previously, the units have already been allocated to beneficiaries, most of whom are come from impoverished backgrounds. Though these houses have been given to people in need, the roll-out of housing has been tremendously slow. Given that phase 1a was completed in 2010, it is now 2016 and phase 1b is still under construction. There are many factors to why the development has been lagging, but this should not be the case. The housing programme has elaborate plans to provide housing for poorer people, however, many people who have been on a waiting list for many years are still waiting to get a house. Housing allocation affects the sustainability of the development whereby, if a development aims to allocate a certain number of people, it limits its potential to enhance the socio-economic aspects of people's lives, whereby people how have yet to receive will possibly not have formal shelter (which is a basic need), and by not residing within the houses of the Cornubia development, it limits such people's access to economic opportunities. This goes against the vision of Cornubia, which emphasises on need to bring people from the lower socio-economic levels and job opportunities into the same location.

Another aspect regarding social sustainability is that of the Housing Programmes Social Facilities Framework. This framework aims to provide social facilities within a social facilities cluster within the development. Within these clusters there are various facilities with regards to health care, education, recreation, etc. However, as it stands, there are no such clusters that have been developed. Though the phase 1a residents have access to 'mini parks' and a mobile clinic that comes into the area once every two weeks, these facilities are not enough. It results in more people having to leave Cornubia to access adequate facilities, and at the same time incurring more costs in time and money. Such a situation goes against the walkability and inclusiveness of both the framework and the development as a whole. The lack of access to other areas also limits the level of integration that the development can provide for. If residents are not able to travel to other areas, the Cornubia development becomes isolated

- Economic Sustainability

As seen in the previous chapters, economic sustainability can be seen as meeting the basic social needs of communities. The housing programme states that the development has the potential to create 43,000 permanent jobs and 387,000 construction jobs. However, of the respondents that were interviewed within this research stated that they did not have a formal jobs, and none stated that they had benefitted from any jobs associated with the development of Cornubia. In order to sustain their livelihoods, their income comes from either grants, renters or selling goods from tuckshops within their houses. Information gathered from the respondents' state that selling goods and having renters within their houses contravenes the acquirement of their title deeds as they are not allowed to do either within their households. There are a multitude of reasons to why such residents are not able to access job provided by the development, but the fact that they are willing to gamble with their title deeds in order to maintain an income brings into question the economic sustainability of the development.

The Cornubia Incubation and Empowerment Centres are also proposed within the framework. These centres aim to drive and facilitate SED programmes, however, none of the residents that where interviewed had no knowledge of such centres nor the programmes. This brings in to question the validity of such a programme. It is possible that as the residential development grows, so will the implementation of such centres and its associated programmes.

A TOD is also envisioned within the development once more housing phases have been established. The TOD is in conjunction with a proposed BRT which will link Cornubia to various other areas. This gives people more choice and access to more economic opportunities as compared to the current situation whereby people have to rely on taxis that only go to certain areas.

- Environmental Sustainability

The 2011 framework for Cornubia places emphasis on preserving and maintain the wetlands and other environmental conservation areas within the development. This is done through an Open Space System. This system aims to create and maintain the preservation of the natural systems which will lead to a decrease in the overall carbon footprint of the Cornubia development. The emphasis to create green spaces is also defined within the social facilities framework of Cornubia. It strives to create efficient land utilization whereby undevelopable land can be used for recreational activities such as parks and sporting grounds. As it currently stands, the OSS and the promotion creation of green spaces has occurred, but only within small portions within the housing development. As stated previously, an EIA has been approved for the Cornubia development. The

purpose of the EIA is to gain a record of decision as to whether development is allowed on the proposed site or not (NEMA, 1998). On this basis, within the EIA, various specialist studies have been undertaken to ensure that the practices of the development occur in a sustainable manner. If this was not the case, the EIA would have deemed the Cornubia development as unsustainable

How can the Housing programme assist Cornubia in becoming a sustainable human settlement?

The biggest problem that restricts Cornubia in becoming a Sustainable human settlement at the present moment, is the size of the housing programme. Given that there are only 486 households, means that most facilities envisioned on site will not be efficient as there are not enough people with regards to threshold. However, there are a few aspects that can improved upon within the housing development that will assist Cornubia in becoming a sustainable human settlement:

- Socio-economic development

If the social facilities framework is implemented, it has the potential to greatly enhance social aspects of the residents' lives through facility and service provision. However, the biggest problem that the housing programme faces currently is education. In this way, education does not only mean schools, libraries or other learning facilities (colleges), but education of sustainability practices and economic opportunities. As it stands, Tongaat Hulett Development has a Socio-economic and Innovative Programme (SSIP) which is aimed at helping residents with regards to acquiring skills for jobs. This programme needs to be promoted more and made available to more residents as current residents of the housing programme come from disadvantaged back ground, most of whom are not well educated. Such people are also not aware of any newer sustainable practices that they can do within their households, such as water conservation and recycling. This results in a decrease of resource usage and wastage. The social and economic benefits of educating people in this way increase the sustainability of both the housing programme and the development as a whole.

- Economic development

The fact that some residents are restricted to have renters within their homes to sustain their livelihoods is an extremely unstainable practice. Firstly, once people allow renters into their homes, results in a than normal occupancy rate. The more people within a households, the more resources are used and an increase in resource wastage. This goes against conventional sustainable practices as there is a higher dependency on the environment. Over and above the social benefits that the SSIP can produce, the access to jobs is an extremely important aspect to the continuation of the

housing programme. If residents are unable to acquire jobs, then they need to be informed on how to start their own businesses. However, the agreement that residents have with the municipality regarding the restriction of businesses (such as tuckshops) to be run from households contradicts, to some extent, the Cornubia Incubation and Empowerment Centre (CIEC) which aims to promote the creation of SMMEs. Such a situation needs to be addressed. As stated previously, once residents of the housing programme acquire jobs or create their own businesses, the whole residential development will have a major impact on the rate base of Durban, whereby it has the potential to bring in more capital with regards to rates revenue for the municipality. This results in more funding being available for more housing development, which will help more people.

- Need for more 'Green Initiatives'

The OSS that is implemented within the development helps to preserve the environment, however, there are not many green spaces for recreational purposes proposed. Focusing on preserving and conserving the environment does help to maintain the environmental sustainability of the development, but by incorporating community participation within such initiatives enhances communities' interaction with the environment. Green initiatives goes beyond land for recreation or conservation, but also relates to green initiatives within households. As stated previously, residents need to be educated with regard to sustainability practices that they can adopt within their households. This will lead to more environmentally conscious and sustainable development and society

The Cornubia development has the potential to become a sustainable human settlement. As it stands, the current threshold of residents on-site are not enough to maintain certain facilities. On paper, once more phases have been completed and the implementation of all services and facilities are in place, all stakeholders involved in the development will have access to a sustainable human settlement that meets their social, environmental and economic need

Recommendations

In South Africa, previous thoughts regarding development in relation to the environment and its associated natural wealth has "led to the assumption that all economic growth must of necessity consume more materials, eco-system services, and energy. There is an implicit assumption that resources such as water, energy, minerals, plant and animal products and air quality will constantly be available no matter how we live, produce and consume" (DoEA, 2008:12-13). We now find that it is of utmost importance to sustain the environment and its precious limited resources. The need for

sustainable development in South Africa is of utmost importance, however, sustainable development does not only mean the preservation of the environment. Social, economic and environmental aspects need to be considered together and encompass such within our systems of governance. Within this research, policies of sustainable development are well defined within NEMA and the 2008 framework by the Department of Environmental Affairs. However, what constitutes as sustainable development and sustainable housing is not unified within all municipalities, as it is done nationally with regards to Sustainable development. Local government is left to deal with sustainable human settlements. There needs to be a national understanding/consensus of what constitutes sustainable human settlements and sustainable housing, so as to put all municipalities along a unified growth path. For example, within the research, there was no documentation found that defined how the local government understood/defined what constitutes a sustainable human settlement. the reason for not being able to find such documentation could be due to either time restrictions, not being able to interview an official from the planning department who is responsible for the housing programme or the fact that there are no such documents. This is a gap in research that needs to be filled, both in the context of KZN and national government with regard to a consensus on sustainable human settlements.

The Cornubia integrated human settlement aims to create a sustainable human settlement. The development as a whole is still within its early phases with regards to its housing programme. This puts it at a disadvantage when investigating the sustainability of the development. There are many facilities services that are not available at present moment due to the lack of threshold. In this way, recommendations regarding what can be done to improve the sustainability of the development can be gathered from the proposed plans for the development by the eThekwini municipality and Tongaat Hulett Development. However, a recommendation regarding title deeds is proposed to the municipality. Beneficiaries of houses only receive their title deeds 5 years after they have received their houses. They are not allowed to edit the houses in any way. The majority of residents of Phase 1a come from disadvantaged backgrounds. Their skills are limited and are therefore forced to find means to support their livelihoods. As seen within this research, some residents have resorted to converting parts of their houses into tuckshops. This is an example of SMME creation and therefore should be encouraged. Respondents who have tuckshops in their houses also stated their displeasure of not being able to edit their houses or use their houses as collateral as they do not have their title deeds. This limits their economic potential for SMMEs to occur and prosper. The recommendation with regards to title deeds is that government should ease certain conditions within the title deed contract. Title deeds do not only affects the editing of houses, but it also

restricts residents using their homes as collateral when trying to apply for loans. The money from such loans could be used to better their lives by paying for education or skills development.

In summation, the housing programme of Cornubia provides a multitude of sustainable practices within its frameworks, plans and strategies. However most of these practices will only be implemented (thus realising its full potential) when more housing phases have been completed. The essence of the development is to promote equity amongst all people. Due to injustices of the past, many social problems are still prevalent in this country. By creating sustainable human settlements, like Cornubia, allows for South Africa and its citizens address such problems and allows the country to grow and prosper in a more equitable and sustainable way.

Reference List

Bassa, H. (2015). Environmental Impact Assessment for the Proposed Cornubia Mixed-Use, Phased Development, Phase 2, Mount Edgecombe

Baxter, P. & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice research. The Qualitative Report. 13(4): 544–559. Available: http://www.nova.edu/ssss/QR/QR13-4/baxter.pdf. (Assessed: 10/10/2016)

Behrens, R. & Wilkinson, P. (2003). Metropolitan Transport Planning in Cape Town, South Africa: A Critical Assessment of Key Difficulties. Cape Town: Faculty of Engineering and the Built Environment, University of Cape Town,

Byl, C. (2014). Background Paper: Sustainable Human Settlements. Twenty Year Review, South Africa 1994-2014, 1-41

Chen, H. (2006). A theory-driven evaluation perspective on mixed method research. Research in Schools, 13(1), 75–83.

City of Johannesburg. (2006). Reflecting on a solid foundation: Building developmental local government

Colin, D. (2010) "The value of qualitative research". Idea Works, 17 August 2010. Available: http://www.ideaworks.com/the-value-of-qualitative-research (Accessed: 21/10/2016)

Constitution of the Republic of South Africa. (1996). Bill of Rights, Section 26.

Daly, H. (1996). Beyond Growth: The Economics of Sustainable Development. Boston: Beacon Press.

Darkwa, I (2006). Post-Occupancy Evaluation of State-Subsidised Housing Units in Kayamandi, Stellenbosch, University of Stellenbosch

Breaking New Ground (BNG). (2004) A comprehensive plan for the creation of sustainable human settlements. Pretoria: Department of Human Settlements.

Department of Co-operative Governance and Traditional Affairs (CoGTA). 2014. First phase of Cornubia integrated human settlement completed. Available: http://www.dta.gov.za/cgta/index.php/news/latest/532-first-phase-of-cornubia-integrated-human-settlement-completed (Assessed: 20/05/2016)

Department of Environmental Affairs (DoEA). (2008) A National Framework for Sustainable Development in South Africa

Department of Housing (DoH). (2003). Provincial budgets and expenditure review 2003/04 – 2009/10.

Department of Human Settlements (DoHS). (2000). National Housing Code. Pretoria, South Africa.

Department of Human Settlements (DoHS). (2011). Cornubia Phase 1A Housing Project Status Quo Report EThekwini Municipality

Dewar, D. (2000). The relevance of the compact city approach: the management of urban growth in South African cities. In *Compact cities: sustainable urban forms for developing countries*. Edited by Burgess, R. and Jenkins, M. London. 209-218.

Donaldson, R. (2001). A model for South African urban development in the 21st century. In 20th South African Transport Conference "Meeting the Transport Challenges in Southern Africa. Paper presented at the 20th annual South African Transport Conference, Pretoria, 16-20 July 2001. Available: http://www.durban.gov.za/City_Services/housing/Pages/Cornubia.aspx. (Assessed: 16/10/2016)

EThekwini Municipality. (2010). Cornubia Integrated Human Settlement leaflet, EThekwini Municipality, Durban.

EThekwini Municipality. (2016). Package of Plans: Showcasing the Suite of Plans Spatial Equity Learning Exchange

Gardner, D. (2003). Getting South Africans under shelter: An overview of the housing sector. Urban Institute.

Godschalk, D. R. (2004). Land use planning challenges: Coping with conflicts in visions of sustainable development and liveable communities. Journal of the American Planning Association, 70(1), 5-13.

Goodlad, R. (1996). The housing challenge in South Africa. Urban Studies, 33(9), 1629–1645.

Housing Act. (1997). Act No.107 of 1997.

Huchzermeyer, M. (2003). "A legacy of control? The capital subsidy for housing, and informal settlement intervention in South Africa". International Journal of Urban and Regional Research, 27(3), 591-612.

Ibem, E. & Amole, O. (2010). Evaluation of housing policy in Nigeria: A theoretical and conceptual approach. The Built & Human Environment Review. 2. 88–117.

Irurah, D. K., & Boshoff, B. (2003). Confronting Fragmentation: An interpretation of sustainable development and urban sustainability in low-cost housing and settlements in South Africa. In Harrison, P., Huchzermeyer, M. and Mayekiso, M. (eds) Housing and Urban Development in Democratising Society, pp244-262. UCT Press, Cape Town.

Irurah, D. K. (2004). Ecological Design Module at the Sustainability Institute May 31-June 5, 2004.

Iyer Design Studio. (2011). Cornubia Framework Plan and Phase 1 Design Report,

Iyer Design Studio. (2013). Cornubia Retail Park: Planning Report

Iyer Design Studio. (2014). Cornubia Phase 2: Planning Report

Kellett, P & Moore, J. (2003). Routes to home: homelessness and home-making in contrasting societies. “Habitat International” 27:123-141.

Khan, M. (2014) Creating Sustainable Human Settlements using Integrated Housing Developments on Infill sites, University of the Witwatersrand.

KwaZulu-Natal Provincial Department of Human Settlements (KZN DoHS). (2014). Status Quo Report: Cornubia Phase 1A Housing Project b.

Levy, J. (2008). Case Studies: Types, Designs, and Logics of Inference

Mbanjwa, B. (2013). Attention on informal settlements. Available: http://www.iol.co.za/news/south-africa/kwazulu-natal/attention-on-informal-settlements-1531295 (Assessed: 20/05/2016)

Mokgalapa, S. (2012). Quality of RDP Housing Remains Poor. Available: http://www.politicsweb.co.za/archive/quality-of-rdp-housing-remains-poor--stevens-mokga. (Assessed: 12/09/2016)

Morare, M. (2014). The Housing Crisis in South Africa, South African Catholic Bishop Institute

Naidoo, R. (2010). Environmental Impact Report for the Proposed Cornubia Mixed Use Phased Development: Phase 1, Mount Edgecombe

National Environmental Management Act 107 of 1998

National Housing Code (2000).

Nelson Mandela Bay Municipality. (2007). Sustainable Community Planning Guide

Patton, M. Q. (2002). Qualitative research and evaluation methods (3rd ed.). Thousand Oaks, CA: Sage.

Reconstruction and Development Programme (RDP). (1994).

Roberts, D. and Diederichs, N. (2002). Durban's Local Agenda 21 programme: tackling sustainable development in a post-apartheid city.

Sattherwaite, D. (2004). The Earthscan Reader in Sustainable Cities. Earthscan: London.

Socio-Economic Sustainability and Innovation Programme (SSIP). (2016). Cornubia Case study.

SA Government News Agency. (2014). Cornubia Interchange to create significant benefits for business. Website: http://sapropertyinsider.co.za/2016/05/26/cornubiainterchangetocreatesignificantbenefitsforbusinesses/ (Assessed: 21/09/2016)

Sustainability Institute. (2009). Sustainable Neighbourhood Design Manual: A Non-Technical Guide. Final Draft.

Sutherland, C., Sim, V., Scott, D. & Robbins, G. (2011). The urban politics of a large scale housing investment: The case of the Cornubia housing project in Durban, South Africa. Available: www.devstud.org.uk/.../4ed8077b4773b_sutherland.slot_1._p311.ppt (Assessed: 21/09/2016).

Syn-Consult Africa. (2006). City of Johannesburg: Sustainable Housing Strategy. Unedited Draft: Work in Progress. Syn-Consult Africa (PTY) Ltd. June 5, 2006

Tissington, K. (2010). A Review of Housing Policy and Development in South Africa since 1994. Towards an SER Matrix: Monitoring the Progressive Realisation of Socio-Economic Rights in South Africa. Available: http://www.ronewaconsulting.co.za/wp-content/uploads/2014/03/A-Review-of-Housing-Policy-and-Development-in-South-Africa-since-1994-Kate-Tessington-2010.pdf (Accessed: 22/092016)

Tissington, K. (2011). Socio-economics Rights Institute of South Africa - A Resource Guide to Housing in South Africa 1994-2010, Legislation, Policy, Programmes and Practice

Todes, A. (2011). "Reinventing planning: Critical reflections". In Urban Forum (Vol. 22, No. 2, pp. 115-133).

Tongaat Hulett Development. (2011). 2010 Cornubia Framework Plan: Presentation to ECOD, 3 March 2011

Tongaat Hulett Development. (2014). Cornubia Case Study: Tongaat Hulett Partnership with EThekwini and National Housing

World Commission on Environment and Development. (1987). Our Common Future. Brundtland Commission. New York: Oxford University Press.

Yin, R. (1994). Case study research: design and methods. 2nd edition.

Diagrams

Diagram 1:

3 Components that define Sustainable Development

Available: http://www.7continents5oceans.com/wp-content/uploads/2015/05/Sustainable-Development-2.png (Assessed: 23/07/2016)

Diagram 2:

Systems approach to sustainable development.

Department of Environmental Affairs (DoEA). (2008) A National Framework for Sustainable Development in South Africa

Diagram 3:

Complexing and co-evolution of built environment, civilisation and development.

Irurah, D. K. (2004). Ecological Design Module at the Sustainability Institute May 31-June 5, 2004.

Diagram 4:

Location map of KZN and Durban

Available: http://www.southafrica-canada.caPNGmap_south_africa.gif (Assessed: 27/08/2016)

Diagram 5:

Location of Durban in relation to KZN

Available: http://www.booktravel.travel/images/map-greater_durban.jpg
(Assessed: 27/08/2016)

Diagram 6:

Borders of Cornubia

EThekwini Municipality. (2016). Package of Plans: Showcasing the Suite of Plans Spatial Equity Learning Exchange

Diagram 7:

Location of the development site (green) in relation to the King Shaka Int. Airport (orange) and the Durban coast

Tongaat Hulett Development. (2011). 2010 Cornubia Framework Plan: Presentation to ECOD, 3 March 2011

Diagram 8:

Land uses of Cornubia per the Framework

Iyer Design Studio. (2013). Cornubia Retail Park: Planning Report

Diagram 9:

Distribution of land ownership

Iyer Design Studio. (2013). Cornubia Retail Park: Planning Report

Diagram 10:

Environmental Site Considerations of Cornubia

EThekwini Municipality. (2016). Package of Plans: Showcasing the Suite of Plans Spatial Equity Learning Exchange

Diagram 11:

Conceptual SDF of Cornubia and its linkages to surrounding areas.

EThekwini Municipality. (2016). Package of Plans: Showcasing the Suite of Plans Spatial Equity Learning Exchange

Appendix

Consent form

I, the participant, am fully aware of the aim of the research and the purpose of my participation in the study has been clearly explained.

I acknowledge that I will participate in an interview between myself and Kavish Bodhi at a time, date and location decided between us. It is understood that my participation in this research is voluntary and I do not have to answer any questions that make me feel uncomfortable and I may stop the interview at any time. I am aware that I may withdraw or refuse participation at any time and that no penalties or loss of benefits will occur if I choose to do so. It has been explained that I will not receive any monetary payment or other treatments in return for my participation in this research. I agree that Kavish Bodhi may use information provided during the interview in the research report, and I understand I will remain anonymous in my responses unless stated that anonymity will not be required by myself. I may not hold Kavish Bodhi liable for identification through association.

I agree for my responses to be audio-taped during the interview (please tick):

YES NO

By signing this form, I agree to the above statements.

_____ _____

Participant signature Date

_____

Kavish Bodhi

Participant Information Sheet

Good day;

My name is Kavish Bodhi and I am currently enrolled as an Honours student at the University of the Witwatersrand (B.SC Honours in Urban and Regional Planning). I am undertaking research as part of my fulfilment of the requirements of my degree.

This research entails investigating the Sustainability of the Housing Component within Cornubia Integrated Human Settlement development and aims at uncovering issues pertaining to this in regard to the creation of sustainable human settlements. The investigation involves researching aspects of the Cornubia development as a case study, and thereby I am interviewing property developers and officials related to such development. Sustainable human settlements result in a better quality of life for people as opposed to housing provision only, therefore the potential benefit of this research occurs through identifying what principles of sustainable human settlements have been implemented and what principles still need to be implemented. My research finally hopes to highlight to what extent the housing component with the Cornubia integrated human settlement encompasses principles of sustainability and thus whether it results in the creation of sustainable human settlements.

I warmly invite you to participate in this research as your contribution will be valuable to building my understanding of the issues regarding sustainable human settlements through Cornubia development in your area. The reason for your selection as a participant, is due to your relation to the Cornubia Development as a home owner and resident. Participation in this research requires you to be involved in an interview/s with myself as the interviewer at a time, date and location decided between us. Participation in such interviews does not entitle you to any monetary payment or any other treatment. I wish to gain as much information you feel comfortable sharing with me, and the involvement by you in this study is purely voluntary. You may stop the interview at any time, not answer interview questions that make you uncomfortable and you have the right to fully refuse involvement or withdraw from the study at any time from the start to end of the research period (June to August 2016) and no penalties or loss of benefits will occur if you choose to do so. Your personal information will be confidential and your responses will remain anonymous in the research unless consent from you (the participant) is granted to not remain anonymous. Lastly, information you provide will be compiled into an Honours Research Report, and will be made available electronically via the internet to only staff and students of the University of the Witwatersrand. You may request to receive a summary of the research report.

Thank you, and if you have any questions/queries or complaints regarding participation in this study feel free to contact myself or my supervisor.

My contact: 560576@students.wits.ac.za

Supervisor contact: brian.boshoff@wits.ac.za

Interview with Developer

Per my desktop research, I have found that in 2008 Tongaat Hulett Development and government signed a Cooperation and Alignment Agreement which defined the terms of a partnership involving the development of the Northern Corridor along the Durban Coast (Tongaat Hulett Development, 2014:1). The initial development within this corridor was the Cornubia Integrated Human Settlement by Tongaat Hulett Development. "Tongaat Hulett Development agreed to sell 659 hectares of land to the Municipality for the development of subsidised housing and on the balance of the land, Tongaat Hulett Development is currently developing a range of commercial, industrial and market-related residential uses to support and complement the lower-income housing" (Tongaat Hulett Development, 2014:2). The holistic development of Cornubia includes retail, commercial, bulk industry and residential components. Cornubia is consider by Durban Municipality as an Integrated Human Settlement because it aims to elevate people from the lower socio-economic levels and job opportunities into the same location through aligning institutional, financial, human and managerial resources (Tongaat Hulett Development, 2014).

Though Tongaat Hulett Development does not deal with top structures in Cornubia, I aim to understand what sustainability practices have been implemented within the Housing development, per the following questions:

1. "A key thrust is ensuring a balanced community with a range of housing types and affordability with access to social facilities, amenities and employment opportunities, all within walking distance."
   What steps have been taken to create this identity of integration?
   Is it only integration of various economic brackets?
2. Could you please elaborate if any of the following sustainable housing practices/criteria have been implemented within the housing component of Cornubia:

- Locally produced and sourced materials
- environmental impact
- Thermal efficiency
- Occupant needs and health considerations
- Recyclability of building materials
- Use of renewable resources

3. What is the process of securing title deeds for those living in government subsidized units?
4. What specific economic opportunities does the development provide for?
5. Cost-efficient housing also means savings for our community by reducing the cost of housing on the environment; reducing the likelihood of injury and the burden on the health care system; and reducing the incidence and cost of crime.
   Therefore, from the above, how cost efficient is the development for the community?
6. What safety and security measures have been put in place to reduce crime and promote safety?
7. What healthcare options are available to residents both within and outside of the development?
8. Is there any Socio-ecological participation of the community/residents?
9. Are there any continuous social conversations, alliance and partnership building between residents and officials?
10. What water efficient, energy efficient and waste efficient practices have been implemented within the development?

11. I would also like to understand the current progress of the proposed framework by Tongaat Hulett Development in 2011 i.e. what has manifested and what is still to be developed.

Interview with Residents

Sustainable Housing

1. Economic

- Construction costs – COR,

Cost-efficient building materials, economic planning and 'smart' ideas. For example, standardising the size of wardrobes, kitchen cabinets, windows and bathroom vanities and specifying recycled and readily available materials can save money.

- On-going running costs – monthly, budgeting

Ongoing costs can really add up over the life of the home. Significant savings are to be gained by carefully considering the design of the home and which fixtures and fittings to include. For example, energy-efficient showers and taps use less hot water

Long-term maintenance cost – renovate inside or outside, change

Careful choice and selection of materials and the well-thought out design of a smart and sustainable home reduces repair and ongoing maintenance costs. Often the ongoing and long-term savings will outweigh any initial cost.

- Title deeds
- Cost efficiency for community

Cost-efficient housing also means savings for our community by reducing the cost of housing on the environment; reducing the likelihood of injury and the burden on the health care system; and reducing the incidence and cost of crime

2. Social

- Safety

A safe and secure home reduces the likelihood of injuries in and around the home.

- Security

A secure home uses designs and fittings to reduce crime.

- Universal design

A home that is universally designed is flexible and comfortable for people with varying abilities at different stages of their lives.

3. Environmental

- Water Efficiency

You can be water efficient by choosing water-saving showers and taps and consider using water tanks for the garden and flushing the toilet.

- Energy Efficiency

A smart home reduces energy consumption, saving money for you and your family. Passive solar design features such as house orientation, ventilation, insulation and adequate shading can improve energy efficiency. In many cases, you can keep your home cool in summer and warm in winter without artificial heating and cooling devices.

- Waste Efficiency

Careful design and planning can limit waste during initial construction. It may also reduce the need for expensive modifications as needs change.

4. Transport

- Do you work?
- Occupation?
- Where do you work?
- What transport mechanism do you use?
- Social Movement?