



The Impact of Informal Settlements on Environmentally Sensitive Areas: A Case Study of Cato Crest Informal Settlement, in Durban

by

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Declaration

I, Zolani Khumalo declare that:

- The research reported in this dissertation, except where otherwise indicated, is my own.
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Acronyms

ASGISA	Accelerated Shared Growth Initiative for South Africa
ABM	Abahlali BaseMjondolo
AIDS	Autoimmune Deficiency Syndrome
BNG	Breaking New Ground
BP	British Petroleum
CBD	Central Business District
CDMA	Cato Manor Development Association
CNU	Congress of New Urbanism
DFA	Development Facilitations Act
ECD	Early Childhood Development
ESKOM	Electricity Supply Commission
GEAR	Growth, Employment and Redistribution
HIV	Human Immunodeficiency Virus
ISUP	Informal Settlement Upgrading Programme
NDP	National Development Plan
NEMA	National Environment Management Act
PDA	Planning and Development Act
RDP	Reconstruction and Development Program
SDI	Shack Dwellers International
SMME	Small, Medium and Micro Enterprises
SPLUMA	Spatial Planning and Land Use Management Act

StatsSA	Statistics South Africa
UN	The United Nations
U.S.	United States of America
WBI	World Bank Institute
WCED	World Commission on Environment and Development
WUF	World Urban Forum

Abstract

Apartheid policies promoted racial segregation and thus acted as a catalyst to the rising slum settlements in post-democratic South Africa. The encroachment of informal settlements on to the existing natural environment, the shortage of housing and service delivery is prevalent in Cato Crest. The shortages of living abodes and the cramped living conditions have forced residents within the settlement to continuously invade the neighbouring natural environment and animal habitat.

This study intends to examine the environmental impacts caused by the informal settlements within the Cato Crest area, ecological challenges experienced by the residents of Cato Crest due to the lack of essential service infrastructure, and provide answers to the reasons for the emergence of informal settlements in the Cato Crest area. The study further analyzes the environmental effects of the lack of essential service infrastructure within Cato Crest area and the effects of urbanization within the study area of Cato Crest. The study area of Cato Crest informal settlements forms part of Cato Manor. Cato Manor is located 5 kilometers off the Durban Central business district.

A qualitative research method was adopted and primary and secondary data sources were used to elicit data on the relationship between informal settlements and the encroached environmentally sensitive areas in Cato Crest. Non-probability sampling methods were adopted to execute purposive and judgmental samplings. A sample size of 30 respondents was interviewed during the acquisition of primary data. A thematic analysis was used to analyze qualitative data.

The key approaches of this study are delineated in the key frameworks which are namely; the theory and concept of urbanization, the definition and characteristics of informal settlements, the unravelling of the natural environment, the principles and concepts of sustainable development and the relationship created by the encroachment of informal settlements in Cato Crest against the existing natural environmentally sensitive areas. Theoretical concepts such as the Bronfenbrenner's theory of human ecology and development, the development theory and the theory of New Urbanism are used to define their relationship with the state of Cato Crest informal settlement. These key frameworks and theoretical concepts are explicitly interrogated to extrapolate the

influences and attachment they have to relationship of the natural environment and residents of Cato Crest informal settlement.

The residents of Cato Crest informal settlements live in a poverty-stricken environment. The natural environment is being heavily encroached and polluted. The lack of essential services such as electricity, running ablution facilities and waste disposal are also a contributing factor to the pollution of the natural environment and environmentally sensitive areas.

The study suggests the following recommendations for both the municipality and residents of Cato crest informal settlement. There needs to be a concise community involvement in order for a bottom up approach to be implemented to improve the quality of living at Cato Crest informal settlement. Controlled encroachment onto undevelopable and environmentally sensitive land will ensure that damage to the existing biodiversity is limited. The improvements of the beneficiaries' socio economic status can be achieved through the structuring of small business enterprises by providing monetary funding, thus reducing unemployment. A change in the dependency mentality of residents into a system of self-reliance will reconstruct social and economic norms within Cato Manor which will engineer a thinking pattern that is both optimistic and positive amongst the community members.

The conclusion reached in the study is that the perpetual existence of socio-economic poverty in the African diaspora can be attributed to the highly subtle capitalist affirmation of developmental theories and legislation. Developmental theories favour and protect economic interests more, rather than changing the status quo of societal issues. This is also administered and maintained at the detriment of the natural environment. According to the eThekweni Municipality, the complete eradication of informal settlements has since been halted by the municipality. These results indicate that a deeper conversation on creating a symbiotic relationship between informal settlements and the natural environment is critical.

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Chapter one: Introduction to the study

1.1 Introduction

Apartheid planning was created and used to racially segregate the population of South Africa. *The Natives' Land Act of 1913 and The Native (Urban Areas) Act of 1923* were implemented as foundations to ensuring that apartheid planning in South Africa became a benchmark in controlling the movement of people into the urban fabric (Hickel, 2012). The control of the swelling informal settlements during the mid-1980s was mitigated through the demolition of shanty dwellings by the apartheid government. While apartheid policies promoted segregation and the lack of inclusive planning approaches, they acted as a catalyst to the rising of slum settlements even beyond post 1994. The control of urbanization allowed white people to be the only racial group to move freely within the urban areas in South Africa. This encouraged land invasions in unoccupied lands by the black population (Marais & Ntema, 2013). The existence of informal settlements in and around South African cities still invokes a problem, particularly around environmentally sensitive areas. This phenomenon is still prevalent, particularly at Cato Crest Informal Settlement. In the past, the greater Cato Manor had an escalating rise of informal settlements, which has been detrimental to the existing natural environment.

Informal settlements can be classified as low-income housing units that are built informally. They are usually found in the neglected part of the urban fabric. They usually occur at the edges of the cities. These are spontaneously occurring settlements that do not have security of tenure. The UN Habitat Expert group that met in Nairobi in 2002 classified the following characteristics that define a settlement as a slum: “a group of individuals living under the same roof and lacking one or more of the following conditions: (1) access to improved water; (2) access to improved sanitation; (3) access to secure tenure; (4) durability of housing and (5) insufficient living area” (UN Habitat 2006/7b: 1).

The geographic environment of Cato Manor can be broadly described as essentially steeply contoured with valleys. The area also has a river called uMkhumbane river

traversing at the centre of Cato Manor (Pillay & Webster, 1997:7-8). Cato Manor is situated in the regions which have in the past been defined as being “within an important biogeographic replacement transition zone between the tropical elements extending down from the north and the temperate elements extending upward from the south” (Pillay & Webster, 1997:10). These areas had a high element of animal and plant biodiversity. The survival of such resources was dependent on the climate and management of these resources. Educating the community about environmental conservation can also go a long way in preserving the environment (Pillay & Wester, 1997: 5). These resources have been encroached over the years by the emergence of informal settlements in the area of Cato Crest.

The encroachment of informal settlements towards the existing natural environment, the shortage of housing and service delivery has been prevalent in the Cato Crest area. The shortages of living abodes and cramped living conditions have forced some communities to invade vacant pieces of land. These encroachments, which are a response to lack of housing, are also a threat to the existing sensitive environmental areas within the study area. There is a housing crisis in most Sub-Saharan countries; particularly in the Southern Hemisphere, this problem directly speaks to the escalating rise in informal settlements. The rapidly increasing population also has an effect on the rise in demand for housing. The escalating poverty rate, particularly in South Africa, has made it difficult to compensate for the rise in urban population, growth and the delivery of adequate housing facilities (Zama, 2005).

1.2 Problem Statement

The apartheid government regime created racially fragmented settlements, particularly in the area of Cato Crest informal settlements. This created an environment that is both dysfunctional and inefficient to support low-income residents that are affected by the escalating rise in new urbanism. Change could be implemented by the inclusion of new structures within government spheres aimed at reconstructing a non-racial society (Maharaj et al., 2007).

There are 2.1 million South Africans living in poor housing conditions without adequate access to electricity, water and sanitation (WBI, 2011). There are currently 2700

informal settlements in South Africa and that number continues to grow at a rate of 5-7 per cent each year (Bennett & Fieuw, 2012). The actual backlog of slum dwelling is often unknown as there are a lot of backyard settlements and poor record keeping by government departments (Ziblim, 2013: 18). Some provinces have shown a decline in the number of emerging slums. Provinces such as Limpopo, KwaZulu-Natal and the Eastern Cape for instance have shown a decline in the number of emerging slum dwellings (Ziblim, 2013: 18). This is besides the fact that it was reported that in the year 2012, Eastern Cape, KwaZulu-Natal and Limpopo have shown the highest rates of poverty rating at 64%, 61% and 62% respectively (News24, 2012).

According to Meiring (1994:589-590), with the introduction of urbanism in South Africa, the percentage of people residing in urban areas rose from 25% in 1921 to 50% in 1980. The population classified as white and Indian in 1980 had already reached an urbanization percentage of 91% and 89% respectively, while only 37% of the black population was urbanized at that stage. The population classified as coloured by the apartheid regime, occupied an intermediate position, with 78% of the community having assimilated to residing in urban areas.

The loss of agricultural land over the last century has also been attributed by overgrazing and the escalating pollution epidemic, which gives access to the encroachment and invasion of alien plant species. The rapid development that was propagated has replaced dense forestry with a neo urban aesthetic look. This move has introduced hard surfaces, storm water drains and new shanty dwellings (Madonsela, 2001). The management of solid waste is also becoming a problem, particularly in the informal settlement community. The population within Cato Crest informal settlement is growing due to the migrating populous from the rural areas. People who reside in Cato Crest do not significantly participate in the growing economy, though they form an indirect aid to various echelons of developments through informal labour. Slum residents need to be incorporated into the everyday activities and services offered to society by government institutions. There is also a challenge to dispose solid waste effectively. Some of the impacts of insufficient solid waste management is the escalation of malaria, typhoid fever, foul smell generated by waste, soil pollution, global warming caused by the greenhouse effect and acid rain (Mokua, 2000).

According to Li et al. (2018), the urban ecological environment provides residents with a comfortable living environment and sense of place which is pivotal to the sustenance of the foundational structures of the urban economic, social and cultural development. Unfortunately with the advancement of urbanization structures, environmentally sensitive areas thus become vulnerable to urban flooding, the heat island effect, and rainfall runoff pollution. The urban eco environment will inevitably deteriorate with the escalation of urbanization, population growth and socioeconomic development. The characteristics and dogmas of urbanism will accumulate a considerable amount of contaminant and complex pollutant ingredients. Most of these developments occur in the vicinity of environmentally sensitive areas. Environmentally sensitive areas are extremely sensitive to artificial disturbances and contaminants hence their preservation should be given special attention.

It is thus important the environmentally sensitive areas (ESAs) are identified and managed in order to provide means of ecosystem management. Identification of ESA using GIS tools will ensure that further measures are implored to maintain the ecosystem's health and raise public living standards.

The lack of such service amenities poses a challenge to fully sustain clean and healthy living conditions. The lack of basic services such as water and sanitation poses a threat not only to the health of residents but also to the existing natural environment. Lack of refuse removals and basic sanitation infrastructure has polluted the existing water stream that flows within the informal settlement. Hence, this creates diseases and an excessive presence of lethal pathogens with the river.

There is a strong link between unhealthy living conditions and the encroachment of the natural environment in Cato Crest. People are living under appalling conditions due to the lack of adequate basic services such as sanitation, water and solid waste removals. These problems are also common in other informal settlements and are detrimental to the existing natural environment. The lack of basic services poses a serious threat to health of all residents residing in the squatter settlement (Rich, 2000). Unlike in the city centre, clean water, shelter and security services are not readily available in Cato Crest. This indicates that though low, medium and high-income residents may dwell in close

proximity to each other, their problems and accessibility to essential necessities of survival are different.

1.3 Main Research Questions

To what degree have informal settlements impacted on the environmentally sensitive areas in Cato Crest?

1.4 Objectives of the study

The study intends to accomplish the following objectives:

- 1.4.1 To examine the environmental impacts caused by the informal settlements within the Cato Crest area.
- 1.4.2 To examine the ecological challenges experienced by the residents of Cato Crest due to the lack of essential service infrastructure.
- 1.4.3 To provide answers to the reasons for the emergence of informal settlements in the Cato Crest area.
- 1.4.4 To analyze the environmental effects of the lack of essential service infrastructure within Cato Crest area.
- 1.4.5 To analyze the effects of urbanization within the area of Cato Crest.

1.5 Subsidiary Questions

- 1.5.1 What are the environmental impacts caused by the informal settlements within the Cato Crest area?
- 1.5.2 What are the ecological challenges experienced by the residents of Cato Crest due to the lack of essential service infrastructure?
- 1.5.3 What are the reasons for the emergence of informal settlements in the area of Cato Crest?
- 1.5.4 What environmental effects does the lack of essential service infrastructure have within the area of Cato Crest?
- 1.5.5 What are the effects of urbanism in the area of Cato Crest?

1.6 Hypothesis

The emergence of informal settlements in Cato Crest has negatively affected the local environmentally sensitive areas.

1.7 Study Rationale

One of the main development issues, in South Africa, is the escalating emergence of informal settlements, particularly around environmentally sensitive areas. The allocation of land and housing units during apartheid was unfairly distributed amongst black people. It has been observed that presently, leapfrog developments have encouraged the formation of informal settlements near these developments. Places of opportunity such as central business district nodes have attracted people to construct temporary structures near developments as a way to be closer to economic opportunities (Marais & Ntema, 2013).

The area of Cato Crest informal settlement continues to be one of the locations that have been affected by the apartheid legacy. This is evident by the existence of violence caused by the inequalities brought by apartheid. There have been effort to redevelop Cato Manor and correct the social divisions created by apartheid. However, areas defined as informal settlements have been with minimal or without adequate service infrastructure, such as water, sanitation and electricity (Gray & Maharaj, 2014). The rate of urbanization has been escalating over the years and this has caused a negative effect on the existing environment worldwide. The damages are particularly acute in the developed world where problems of water pollution, air pollution and flooding are common. The emergence of informal settlements has caused difficulty in the regulation and control of floodwaters. The inability to control the quantity and quality of water flows has affected the pollution and degrading of aquatic systems (Turpie et al, 2017).

Durban is an area that is rich in biodiversity though it has been facing issues with the management of its natural resources. This has caused an increase in floods, solid waste pollution, erosion, wastewater flows and loss of the natural biodiversity. There has also been a spread of alien invasive species. All of these factors have a negative impact on the livelihood of people, which then has a ripple effect on the economy. The motivation of this study stems from the experience of seeing human beings living in destitute conditions. Therefore, the researcher seeks to answer the research questions and achieve

the objections of the research with the aim to inform sustainable solutions for the problem under investigation.

1.8 Limitations of the study

The interview process, as anticipated, was one of the most limiting aspects of the research process. Participants were not remunerated for their contributions. As anticipated by the researcher, this limited the participant's enthusiasm and zest to divulge critical information about the study area. The participants, at certain aspects of the interview, misinterpreted and misunderstood the questions imposed onto them. This led to ambiguous answers, which almost failed to unfold the deeper narrative pursued by the researcher. The translation of responses from indigenous languages to English without losing the deeper context of the responses was a challenge to the researcher.

The area of Cato Crest informal settlement is a volatile area, which may not take kindly to research interviews which bear no visible fruits or benefits to the community. The interpretation of the researcher's presence, in some instances was not interpreted in a positive light by some of the residents of the informal settlement. In light of the recent increase in protest actions in KwaZulu-Natal, the researcher was vigilant, sensitive and open minded towards the livability of the research site.

1.9 Dissertation Outline

Chapter 1: Introduction to the Study

The purpose of this chapter is to introduce the current and historic aspect of the study in the form of an introduction. This chapter further provides a problem statement that the study intends to solve. The chapter also comprises of research objectives, hypothesis and subsidiary questions which seeks to help the researcher achieve the research objectives.

Chapter 2: Research Methodology

This chapter discusses the research methodology adopted during the acquisition of data. This chapter unpacks the tools and techniques used to collect and analyze data collected during the research process.

Chapter 3: Conceptual and Theoretical Framework

This chapter introduces and provides a detailed theoretical framework and conceptual framework of the study. The theoretical approaches comprise of the Brogenbrenner's theory of human ecology and development, development theory and New Urbanism. The conceptual framework analyzes the concepts used to analyze and conceptualize the study. It also comprises of the concepts of urbanization, informal settlements, sense of place and environmental management systems. Precedent studies of the "Favelas" in Brazil and informal settlements in Kenya will aid in interpreting the research's objectives and questions.

Chapter 4: Literature Review

This chapter aims to provide an insightful and in-depth analysis of literature related to the research topic. The chapter will entail a brief legislative analysis of environmental and housing laws, literature relating to the ecology and cosmology of the informal settlement fabric and the recent literature relating to the Cato Crest informal settlement.

Chapter 5: Historical Background of the Study area

The purpose of the chapter is to introduce the history of the study area. The chapter seeks to underline the historical challenges that influence the present conditions of the study area. These historic impacts are brought into light in this chapter

Chapter 6: Data Presentation and Analysis

This chapter comprises of research findings, data analysis and interpretation of findings. Thematic analysis will be used to further analyze data collected on site.

Chapter 7: Summary of Findings, Conclusions and Recommendations

This chapter provides a summary of the findings and conclusion of the research. Recommendations will be made based on the research findings.

Chapter two: Research Methodology

2.1 Introduction

This chapter explains the methods that were used to collect and analyze data. It also explains the sources of data that were used for data collection. Sources of data will comprise of both primary and secondary. Tools which were used to collect data such as questionnaires and interviews are also discussed in this chapter. Sampling methods and data analysis techniques such as non-probability sampling methods and thematic data analysis are also examined in this chapter. As understood by Kothari (2004), research methodology is the systematic relentless search for knowledge on a specific topic. It can also be defined as a movement to acquire information from an unknown point to a known point. Research is orientated from a point of inquisitiveness in order to find the hidden and occult. New research can lead to an addition of information to existing literature. Therefore, appropriate research approach, discussed in detail in this chapter was followed to generate data for this study.

2.2 Research methodology used in the study

The culture and cosmology of the informal settlement needs to be understood in order to correctly sample knowledgeable and reliable informants (Tongco, 2007). Criteria needs to be formulated in order to determine and set the requirements needed for a good and bad informant. Purposive sampling will be aided by these criteria as reliable informants will be easily identified. The issue of credibility relies on three of concepts of enhancing quality and credibility namely; rigorous techniques and methods for gathering data, the credibility of researcher and the philosophical belief in the value of qualitative inquiry (Patton, 1999).

According to Hox & Boeiji (2005), qualitative data involves understanding research complexity, detail and context of the research subject, often consisting of texts, such as interview transcripts and field notes, or audio visual material. The study used qualitative research methods to collect data. Research in the social sciences focuses primarily on qualitative and quantitative research. Qualitative principles contain a set of assumptions and methodological principles (May, 2002). Qualitative research entails the acquiring

of first-hand experiences. This includes the acquiring of lived experiences and interactions of a selected group of people. Qualitative research compiles the interpretation, experience and the everyday living of the selected inhabitants (May, 2002).

This research relied on interviews with relevant stakeholders in order to formulate conclusions with regards to the current status quo of the study area. The researcher interviewed relevant stakeholders from both the community and government departments which ensured that a holistic synopsis was gathered when analyzing data. The study was aimed at interviewing relevant stakeholders within various government sectors. The issue of credibility and trustworthiness is a testing factor within the qualitative approach (Golafshan, 2003). People will always interpret information based on how they perceive their surroundings. It is important that subjective information be used to formulate an analysis that speaks on the perceptions on the ground versus the realities of the surroundings. The general concept of a qualitative approach is to generate and understand through the research (Golafshan, 2003).

2.3 Primary sources of data

According to Hox & Boeiji (2005), primary data is original data collected for a specific research goal. Primary data seeks to source the observer's direct awareness and lived experience. This form of qualitative information gathering has a goal of obtaining the stakeholder's views, perspectives and feelings. Retrieving primary data may have its shortcoming because a lived experience may be subjective in content rather than objective. It is in the researcher's interest that primary data acquired is reliable, trustworthy and devoid of excessive emotion that may compromise the credibility of the research. Primary sources of data can include surveys, interviews, focus groups and general observations. Primary data is also collected using these various techniques, but these techniques are selected to ensure that most precise and informative aspects of data are gathered (Hox & Boeije, 2005). Primary data was obtained through the interview process of various stakeholders who have a direct and indirect influence on the study area.

2.3.1 Sampling method

A sample is generally defined as a subset from a larger population (Rossi et al., 1983). Sampling involved the selection of a group within a population in order to acquire data. It can also be defined as a subgroup that is representative of a particular characteristic within a population (Lathan, 2007). Sampling assists the research into characterizing the different social groups according to the relevance of the topic. Sampling may be administered in accordance to age, gender, race, class and monetary income (May, 2011). Non-probability samples require a sampling frame with a set number of responders. It is usually considered when a set of results is needed for a certain conclusion.

The population can be characterized as the entire set of individuals which findings of a research can be characterized by (Levy, 1991). The individuals within a population are known as elements within the study. Sample surveys can be broken down into probability samples and non-probability samples. A probability sample has the characteristic of having every element within the study known and has a non-zero probability of not being included into the study. The reliability of the study being anticipated can be easily evaluated. This is in contrast of non-probability samples as they offer estimates that cannot be evaluated, as they cannot find confidence in the findings. Non-probability samples are less expensive and less tedious as compared to probability samples. Probability samples are also not feasible in some areas.

Non-probability sampling is sometimes used to execute purposive and judgmental samplings. Purposive sampling has individuals who are considered representative of the population that the study is based upon. The disadvantage of judgmental sampling is that no insight can be obtained in calculating the reliability of the resulting estimates. Non-probability sampling uses subjective methods in deciding which elements are to be included in the sample (Etikan et al., 2016). It does not give the population an equal chance to be included into the sample, which makes non-probability sampling an easier approach to identify suitable informants for this research. Primary data was collected from 30 residents of Cato Crest informal settlement, an Eskom Environmental officer, the ward Councilor of Cato Crest ward and three municipal officials.

2.3.2 Sampling for Cato Crest residents

In 2001, Patel estimated that the number of households in uMkhumbane was around 1500 (Patel, 2011). This number has increased with the migration of people over the years. It will be very hard to keep track of an estimated amount as the migration of people from various places increases the population daily. A decent sample size of thirty household heads of either gender within the Cato Crest informal settlement was considered for the study. Non-probability sampling method is the best way of sampling as this offers a more flexible way of sampling candidates for interview. It is more convenient and may be implemented at a quicker rate as it is the type of sampling that acquires information from willing participants (Lathan, 2007). The non-probability sampling method is chosen on the basis that all adults living in the study area be in some way or form affected by the living conditions of the informal settlement within the study area.

The interview process was strictly conducted on residents who have stayed for a considerably long time within the area. Local resident who are at least 18 years of age should be able to provide informative details on the general cosmology of Cato Crest informal settlement, amongst other issues. The information gathered from these interviews was utilized to formulate conclusions regarding the study topic. The interviews aimed to acquire the feeling, understanding and the lived experiences with regards to the inhabitant residing in the study area (Hox & Boeijs, 2005). The interview questions were sensitive to the situation and lived experiences of the participants. The interview was used to gather information from a lived perspective of the people residing in the study area. It gave a more concise feedback on the cosmology patterns of Cato Crest informal settlement.

2.3.3 Sampling for Municipal Officials

Purposive sampling method was used to sample officials from sectoral departments in the eThekweni Municipality. According to Tongco (2007), the purposive sampling technique is a type of non-probability sampling that is most effective when one needs to study a certain cultural domain with knowledgeable experts within. The interviews with Municipal Officials provided information of how issues that affect both the residents of the informal settlement and environment are mitigated and resolved. These sectors

included the Department of Human Settlements, Engineering Unit, Project Management and Customer Service Centre Department. These departments have a direct and indirect affiliation with service delivery in the area of Cato Crest. According to eThekweni Municipality (2018), the purpose of the Engineering Unit is to provide infrastructure to residents and business within the boundaries of the municipality and the department of Human Settlements facilitates the development of sustainable and integrated human settlements. The municipal officials are employees who are employed in the divisions above and work in environments that facilitate service delivery, project management and delivery of housing units in the eThekweni Municipality. The interview process revealed the level of awareness that the municipality employees have concerning the issues affecting the ecology of the study area. The researcher interviewed three municipal officials.

Purposive sampling was then used in the selection process of accessing participants; it is dependent on the qualities the participant possessed, thus the name judgement sampling. The researcher searched for participants who possess the knowledge required to make the study a success. It was important from the participant's side to not only be knowledgeable but also have an interest in the topic being discussed. Hence, the researcher chose participants who were able to assist in an articulate and reflective manner.

The municipal officers were able to contribute from their records the status over the years of the study area. There was a chance that the municipal officers may not be local residents of the research site, thus the researcher expects from the municipal officers a more scientific review of the status of Cato Crest. The researcher anticipated that municipal officials with experience would be preferable as they can provide substantial information on the deterioration of the environment at Cato Crest area of the past years.

2.4 Research tools used

Data collection tools were in the form of questionnaires, interviews and the use of secondary data. Primary data was objectively scrutinized and interpreted. Interviews provided a first-hand experience into people's lives, experiences, values, attitudes and aspirations (May, 2011).

2.4.1 Interviews

According to the Oxford dictionary, an interview is a face to face or an over the phone conversation, especially for consultation (Oxford Dictionary, 2017). Interviews done in the qualitative approach usually involve an approach of having a conversation with a purpose to find an emotion and lived perspective of the people interviewed (May, 2002). Interviews must be engaging on relevant issues, topics and experiences of people. Interviews assume that it is possible to gain insight by merely asking people about their opinions, perspectives and lived experiences. It is important that the interviewer asks informatively and have an ability to accurately interpret an articulated experience. The interviewer is a miner of information who assumes that the study area has a wealth of information that is relevant to the research. It is important that the structure of the interview allow for the excavation and construction of meaningful knowledge (May, 2002). Interviews were conducted on municipal officials from the department of Customer Services and Human Settlements, the Cato Crest ward councilor and Cato Crest residents. The officers interviewed included Project Liaison Officer from the Customer Services, Project Research Officer from the department of Human Settlements, a registered Professional Town Planner from the department of Human Settlements and an Environmental Officer from the department of Land Development (Eskom). The participants from both the eThekweni Municipality and Eskom Distribution have a wealth of experience regarding the facilitation of projects in the informal settlement sector and the management of various stakeholders.

2.4.2 Ward Councilor

The researcher had interviewed at least one ward councilor during the research. It was expected by the researcher that the ward councilor and residents of the study area will contribute from a more personal context on the cosmology and status of Cato Crest. This will provide contrasting contexts to that of the municipal officers thus giving the researcher more ground to work on when the researcher is analyzing data and formulating recommendations and conclusions.

2.4.3 Questionnaires

Questionnaires are a set of printed questions, usually with a choice of answers that are devised for the purpose of survey and statistical study (Oxford Dictionary, 2017).

Questionnaires can be developed once preliminary work has been done to establish theories that are held regarding the topic of interest. There are various questionnaires that could be used based on the type of study being done, the population of people to be interviewed and the type of sampling to be used (May, 2011). Questionnaires were a useful tool in the gathering of information. The questionnaires gave an idea of the lived experiences of the people in the study area. Questions were standardized and answers were allocated in standardized categories (Hox & Boeije, 2005). Accordingly, questionnaires were given to the residents of Cato Crest informal settlement to gather the demographics of the participants and information relating to the relationship of Cato Crest and the surrounding sensitive environment.

2.5 Observations

Observations made when the researcher walked through Cato Crest were as follows:

- The general deterioration of the environment versus the density of informal settlements in Cato Crest.
- The level of service connections within the Cato Crest informal settlement.
- Visible governmental and private interventions made to combat environmental degradation and encroachment.

2.6 Secondary sources of data

Secondary data is data that has been collected, interpreted and recorded by scholars (Hox & Boeije, 2005). The secondary sources of data can be in the form of government reports, journals, books, internet and periodicals. These sources produce an interpreted account of the administrative attempts made by relevant stakeholders. The full context of the information gathered may not speak in depth to the demands of the current research.

For the purpose of this study, secondary sources of data like books, journals and government reports relating to the topic, online documents and reports were used. Furthermore, South African policies and legislation relating to the study were analyzed. These provided a useful perspective on the improvements or decline thereof of the living conditions of both people and the environment within the study area.

2.7 Data Analysis

Data collected for the study was analysed using thematic data analysis. Thematic data analysis is the most common way of analysing data in a qualitative research approach. According to Braun & Clark (2006: 79), thematic analysis is a method used for 'identifying, analysing, and reporting patterns (themes) within the data'. A theme within a research endeavour is data that is captured in relation to the research question and provides meaning to the dataset in a form of a pattern. A theme will vary in size and pattern, but the main objective is to have a concise report of the content and meaning of the pattern themes.

Thematic data analysis approach to the qualitative approach methods in research seeks to identify patterns of meaning and usually classifies data in accordance to themes. This results in the interpretation of the thematic structures by seeking theoretical and explanatory systems. Thematic approaches and analysis is also used to reduce and manage large volumes of data while ensuring that the context of the information gathered is not lost. The most common forms of thematic tools used to analyse data are interview transcripts, dairies and journals. The use and analysis of maps and drawings is also permitted.

Thematic analysis can also provide a diverse interpretation of the data found and provides a systematic element to data analysis. Thematic analysis ensures that the researcher acquires adequate information, thus ensuring that context is not lost during analysis. Namey et al. (2008: 138) said, "*thematic moves beyond counting explicit words or phrases and focuses on identifying and describing both implicit and explicit ideas. Codes developed for ideas or themes are then applied or linked to raw data as summary markers for later analysis, which may include comparing the relative frequencies of themes or topics within a data set, looking for code co-occurrence, or graphically displaying code relationships.*" Thematic data analysis also allows for the comparison of themes and finds possible linked concepts and relationships.

2.8 Conclusion

This chapter presents an overview of the process of research, the research methodology and data collection tools adopted. A qualitative method of research was adopted with primary and second dary data sources used to gather data on the relationship between informal settlements and the encroached environmentally sensitive areas in Cato Crest. A thematic data analysis was conducted to further draw recommendations and conclusions of the study.

Chapter three: Historical background of the study area

3.1 Introduction

This chapter provides a historical and geographical background of Cato Manor in general and the area of uMkhumbane in particular. It also provides information of how the area of Cato Manor came about, the socio economic status and the demographics of Cato Manor. A judgement in terms of integration and sustainability will be made using housing and planning perspectives. It must be highlighted that the study area of Cato Crest forms part of the greater area of Cato Manor.

3.2 Historical Background

Cato Manor was a vast land, which was acquired by George Cato. Cato Manor has a vast history that is rich in heritage and political turmoil. Various tribes and ethnic groups, particularly Nguni speaking people occupied the area. Amongst the tribes present were the Nqondo and Ntuli tribes. The area was named after its first mayor, George Christopher Cato. The land was largely given to him out of appreciation for his contribution to the community and recognition as Durban's first mayor. Smaller parcels of land were sold to white shareholders in the later 18th century. Indians who had completed their indentured service and had no interest of returning to India then bought most of the land. The land was mostly Indian owned and was used for commercial gardening. The growing number of black Africans migrating from the rural areas resulted in the acute densification of Cato Manor. This caused a scare amongst white owners, mostly for the competition of resources (Makhathini, 1994:1).

According to Makhathini (2004), in 1952, the local council organized a local shelter base to house the homeless. The housing complexes were renamed uMkhumbane after the local river. The source of income for most impoverished locals was the brewing of African beer. The government had a tough time controlling the supply of locally brewed African beer. In March 1954, the Cato Manor Emergency Camp was officially established. Cato Manor in 1954 was proclaimed a white area. The black African settlers in the area were removed to KwaMashu, Chatsworth and uMlazi. These

removals were met with hostile resistance from the local residence and the Natal Indian Council.

The emergence of squatter settlements was a result of alienated crown land being taken by the government forcing any 'illegal settler' to buy into an agreement with the registered owner. Not all black Africans had the financial resources to maintain the escalating rental obligations. The rent escalated in proportion to the value of the owned land. The demarcation of rental settlements were limited to garden plots and the conditions forced the occupier to bind into contractual agreements aimed at keeping the occupier in submission. Rental settlements were limited in the ownership of the number of grazing animals allocated to each family. These challenges forced the black African settlers to reduce their plot sizes due to the plot sizes being proportional to the escalating rent. This then increased the lifespan of the *Natives Land Act of 1913* (Mngonyama, 2002).

3.2.1 Post-Apartheid Cato Manor

The fall of apartheid opened an opportunity to draft legislation that was both inclusive and constitutional. Though the approach was against market related pressures, the upgrading of these informal settlements was done without in-depth participation. The upgrades of informal settlements have done little to counter the policies of segregation during apartheid. The institution of the Reconstruction and Development Program (RDP) and policies such as the Growth, Employment and Redistribution (GEAR), Accelerated Shared Growth Initiative for South Africa (ASGISA), the New Development Path and the latest National Development Plan (NDP) were all implemented to eradicate the ills of apartheid. Some policies did not work well as expected and were later replaced by other policies that aimed at bringing socio-economic development. The expanding urbanization results in an escalating rise in informal settlements, which then hinders effective development (Muzondi, 2014). The existing informal settlements and lack of service delivery are the prime cause of encroachment and water pollution onto the uMkhumbane river.

The formation of the Cato Manor Development Association (CDMA) helped build 4051 houses within Cato Manor. The upgrading projects for informal settlements built 1272

houses and relocating 1110 shacks within the area. A total of 1191 units were transferred to families, 766 housing units were given to residents and a further 9836 housing units were built through various housing projects (CMDA, 2002). Once the CMDA was discontinued, the area then saw a host of informal settlements being destroyed, with 110 informal dwellings being destroyed in January 2013 (Gray & Maharaj, 2014). The Cato Manor Development Programme was able to introduce job opportunities with the construction of Schools, community halls and houses. These initiatives promoted local economic development through the formation of 25 000 jobs (Gray & Maharaj, 2014).

3.3 Location and Locality

Cato Manor is located 5 km west of the Durban Central Business District. The whole area of Cato Manor comprises of 2 000 hectares of land and as of 2015 had a population of 93 000. The municipality has estimated in 2015 that the population would rise to 170 000 due to migration and natural population increase (Gray & Maharaj, 2014). The characteristics of Cato Manor can include poverty, unemployment domestic abuse and violence and high risk of HIV/AIDS.

Figure 3.1 Aerial depiction of Wiggins, uMkhumbane and Cato Crest



Source: www.cmda.org.za (CMDA Location Map)

The sprouting of informal settlements within the study area shows that there has been spatial inequalities that need to be addressed. The area has seen improvements with the implementation of housing subsidies and service infrastructure, which have slowed down over the past decade. This is due to the handing over of responsibilities from the Cato Manor development Agencies to government in 2003 (Gray & Maharaj, 2014).

Figure 3.2 Demarcation of Cato Crest



Source: www.cmda.org.za

The study will comprise mostly of the Cato Crest Area. This is where the uMkhumbane river runs and where there is a dense influx of informal settlements. Focusing on a smaller area will help the researcher narrow down the research given the available resources and time constraints.

3.3.1 Social characteristics of Cato Crest

The urban population has increased over the years, while the rural population has dropped significantly from 48% to 38%. This is due to the opportunities being offered in the Durban city centre (Ziblim, 2013:p.3). According to Census of 2011, Cato Crest has an area of 0.62 square kilometres with a population of 17857 and 7610 households.

Like other informal settlements in Africa, the area of Cato Crest as a whole is now characterised by drug activity, prevalence of HIV infections, crime, single household units and dangerous living conditions, which is a great concern (Wagner, 2017). The area is populated with blacks Africans who make up the majority of the populous (Census, 2011). The top three languages spoken are isiZulu, isiXhosa and Sesotho. There are however other nationalities that reside within the area. Languages such as Tshivenda and Xitsonga are also spoken within the area. The housing in the area is made up of both formal and informal structures. There are shanty dwellings made of wood, tile and hard boards. There are also transit camps which houses people currently waiting to be accommodated in RDP houses built by government. People also reside in Cato Crest as a way of being closer to the central business district. There is a large trek of people from Cato Crest, who walk from Cato Crest to the Central Business District. The promise of housing from the government also compels people to stay in informal settlements within Cato Crest. According to StatsSA (2010), the unemployment rate is at a staggeringly low rate of 45%, with just 24% of the inhabitants being economically active.

3.3.2 Available of Facilities

As apartheid was dismantled officially in 1994, Cato Manor became a prime spot for development as it was only 7 kilometres away from Durban CBD (Gray & Maharaj, 2014). The CMDA was responsible for much of Cato Manor's development; it contributed to infrastructure such as roads, clinics, town and community halls and schools with a lot of funding from the European Union. The CDMA was successful in implementing 3 parks, 5 sports fields, 3 libraries, 9 pre-schools, 6 primary schools, 3 secondary schools, 3 community halls and 1 community health centre (CMDA, 2002). Cato crest now has a host of amenities such as cultural centres, schools, libraries and the infamous Cato Manor police station.

Figure 3.3 Wiggins Primary/High School



Source: Wagner (2017)

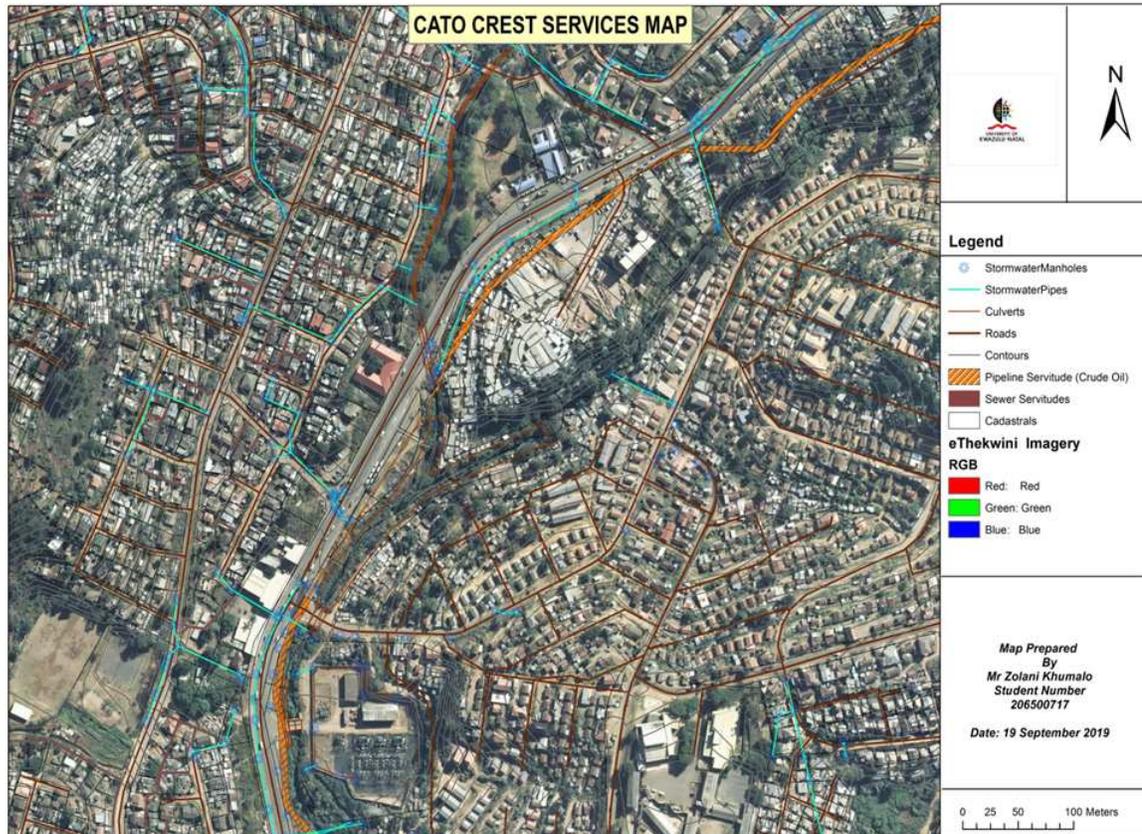
3.3.3 Basic services and infrastructure of Cato Crest

The area of Cato Crest is situated in an opportunistic area where municipal service infrastructure can be installed. The eThekweni Municipality supplies the area of Cato Crest with water, sanitation and electricity supply services. There are a lot of illegal electrical connections in the area. Adequate street lighting is also connected where permissible. Stand pipes and ablution facilities have been provided near the vicinity of the informal settlements. Chemical toilets and sanitation services are cleaned every week; this work is mostly administered by the local inhabitants of the area. Durban solid waste ensures that solid waste is collected every week, and local residents are provided with refuse bags for waste collection.

3.4 Case study analysis

3.4.1 Services in Cato Crest

Figure 3.4.1 Geographical representation of services in Cato Crest

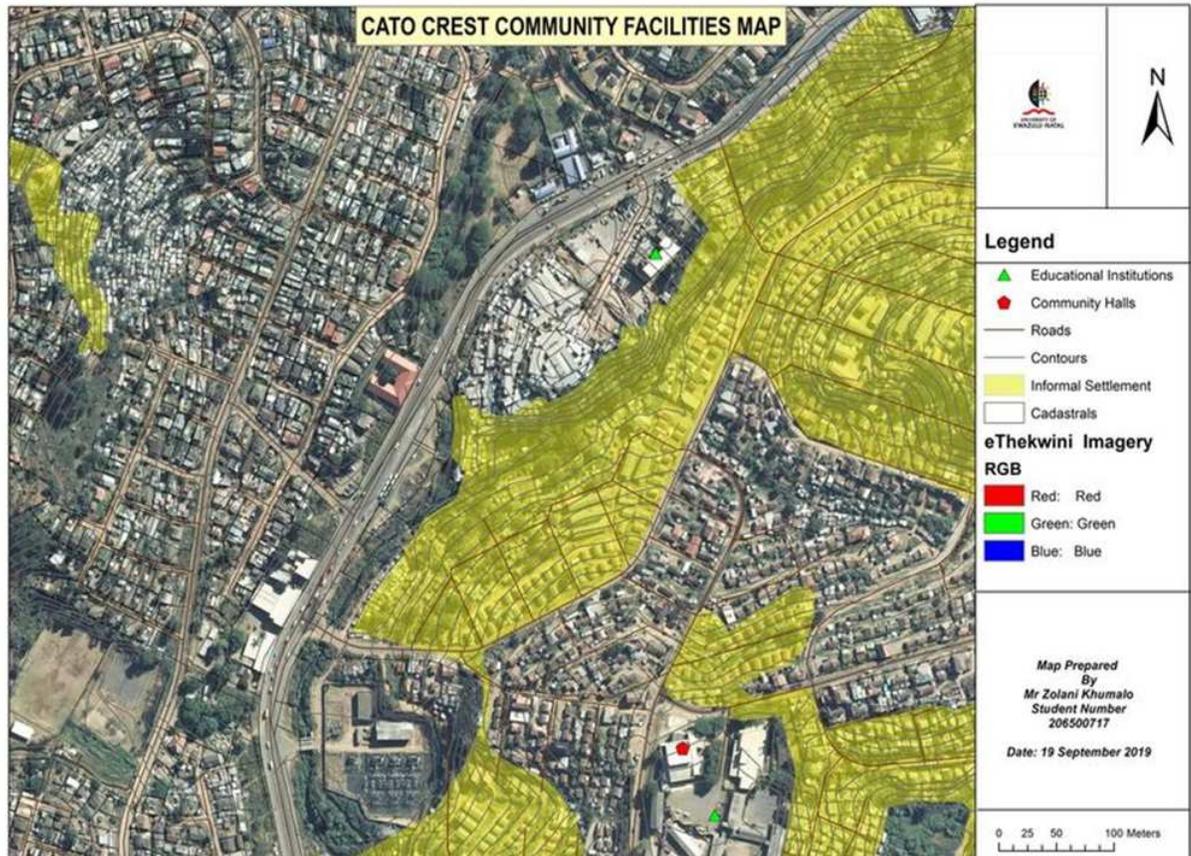


Source: Researcher (2019)

Essential service infrastructure is available in the area of Cato Crest, though some of the major services, such as the existing substation might not have initially been designed to service the existing layout of informal housing infrastructure. Sewer and water pipelines are also installed in the area and these infrastructure services facilitate the existing housing and informal settlements. Road infrastructure networks exist in the area, with a main road acting as both a ward boundary and an activity corridor. There also exists a petrol pipeline infrastructure that services a British Petroleum (BP) garage just up the road. The existing design of informal settlements is devoid of spaces that facilitate planned refurbishments and conformity within the standards of municipality. This makes it difficult for municipality to install road networks, foot paths and green spaces within the informal fabric.

3.4.2 Social Services in Cato Crest

Figure 3.4.2 Geographical representation of social services in Cato Crest



Source: Researcher (2019)

Cato Crest has a sufficient amount of facilities that provides social services in the community. Social accommodation is also available though far and in between within the area of Cato Manor. Cato Crest and the surrounding areas has primary and high schools which service the surrounding areas of Cato Manor. Multipurpose facilities and town halls are also available in the area. The area also boasts economic facilities in the form of shops, hardware stores and informal motor garages, a vast majority of them being found on the activity corridor. Buildings with a historical and cultural ambience have been erected in and around Cato Crest as a sign of remembrance to the historical past of the greater Cato Manor. The difficulty that the municipality has with regards to service delivery is the poor road network within the informal settlements. The poor road networks make it difficult for police vans and ambulances to gain access within the informal settlement.

3.4.3 The environmental status in Cato Crest

Figure 3.4.3 Geographical representation of the environmental status in Cato Crest



Source: Researcher (2019)

The informal settlements in Cato Crest are built in close proximity to an existing natural river. The informal settlements are also built in the vicinity of a 100-year-old flood plain. The river is in existence and it is flowing, though heavily polluted. Fauna and flora that may grow in the vicinity of river banks may be interrupted because of the severe pollution and encroachment of informal settlements. The residents of Cato Crest do not have any symbiotic relationship with the polluted river, the river is seen as a burden and root cause of the pollution that surrounds the informal settlement. All respondents feel that the river should be redirected from its natural path so that it can nourish and replenish away from the bustling city fabric. Polluting the river comes as a consequence of having no land and easily accessible sanitation services, a resulting occurrence the residents have no control over.

3.4.4 Heritage Sites

Cato Manor also boasts the existence of the newly erected building called the uMkhumbane Cultural and Heritage Museum/Centre. The history of uMkhumbane needs to be preserved and shared to all. In addition to the museum, the area also boasts dedicated spaces for community exhibitions, public parks and recreational activities. UMkhumbane is also the final resting place of Queen Thomozile Jezangani Ka Ndwandwe Zulu, mother to King Goodwill Zwelithini (www.durban.gov.za). The queen was a resident of uMkhumbane and after suffering from a short illness, was buried in mass grave site in Chesterville in the year 1959. Her remains were exhumed and reburied at the uMkhumbane Freedom Park, which forms part of the uMkhumbane Heritage Centre.

3.4.5 Unemployment and Health Status

According to StatsSA (2010), unemployment is at 45%, and only 24% of the inhabitants are formally employed and post matric qualifications are at 0.07%. The figures might have changed over the years with an influx of people coming in from different communities. KwaZulu-Natal has the highest proportion of people affected by HIV/AIDS, with the 16.9% of the population being infected (www.durban.gov.za). EThekweni has an HIV prevalence rate of 14.5%. Women between the ages of 15 and 24 years and people with the lowest socio economic status are more vulnerable to the risk of being infected.

3.5 Conclusion

The South African government must conform to the UN Millennium Development Goals of eradicating the poor conditions that 100 million people around the world are living under (Ziblim, 2013: 21). There remains a backlog of more than 2 million outstanding housing schemes that needs to be delivered to the people. Approximately 50 per cent of these households live in what is classified as shanty dwellings (Ziblim, 2013: 1). Government has failed to meet its deadline in the eradication of slum dwellings. The introduction of policies and legislation aims to explore the reasons of these prevalent shortcomings. The eradication of slum dwellings is an intricate challenge that needs

community involvement, adequate decision making at municipal level and access to material resources and financial resources (Ziblim, 2013;p.1).

Chapter four: Conceptual and Theoretical Framework

4.1 Introduction

This chapter intends to unpack the key concepts and theories which inform the study. The researcher aims to explore the Brogenbrenner's theory of human ecology and development in the context of how the principle of bi-directional relationships can influence the relationships of the residents of Cato Crest and the surrounding natural environment. The development theory in this chapter critiques the influence the theory has had on the livelihood and degradation of the environment within the global community of Cato Crest. Clarence Perry's concepts of the neighbourhood unit in terms of the theory of New Urbanism will also be analysed in the chapter, as the concepts of New Urbanism have changed the outlook of how street furniture can be utilised to accommodate innovative technological advancement. These theories speak to the level of liveability and relationship of both the residents of Cato Crest informal settlement and the existing natural sensitive environment.

This chapter also elaborates and delineates the key approaches that inform the major pillars of this study, which are namely urbanisation, informal settlements, the natural environment, sustainable development and a sense of place the residents have to the research area. These concepts will unravel the social policies which were implemented in the post-apartheid era, give definition to what an informal settlement is and how sustainable development assists in protecting the natural environment and sustaining the socio economic status quo for present and future generations

4.2 Conceptual Framework

4.2.1 Urbanization

Urbanization is an expansion of urban areas which is a consequence of global change and the globalization of the world. Urbanization also emanates through the migration and movement of people from the rural areas into the urban fabric (Bashir et al., 2014). The globalization and technological change over the centuries has constituted to a migration of people from rural areas to urban areas. The migration of people from the

rural to the urban setting can be classified as one of the reasons for the expansion of urban regions. The escalation of urbanism has caused considerable harm to the existing environment, with the expansion of urban region and swelling tides of the migrating populous.

Urbanism can be approached into three interrelated perspectives namely, the physical structure, the characteristics of the social structure and the collective attitudes and behaviours of individuals and groups of interest. The concepts of urbanism seek to accommodate the migration of people into the urban setting by placing development in the forefront. This approach seems to work in opposition to the sustainability of the natural environment. The Chicago School of Urban Sociology gained tremendous traction in theorizing the existence of community and urbanism in the mid twentieth century. The scholars within the school recognised certain paradigm shifts in ecological patterns due to migration and population growth. The relationship between individuals and the community, the relationships between progress and nature and relationships between patterns and urban life were analysed in cognise with these changing paradigms (AlSayyad & Roy, 2004). The Los Angeles School of Urban Geography emphasized the role played by capitalism rather than focusing on ecology and human behaviour that encompassed urbanism (AlSayyad & Roy, 2004). The rapid escalation of urbanism has shaped the foundations of the urban fabric layout and has changed the way residents and migrants view the urban setting. The urban setting is viewed as a place of opportunity and innovation. This is push factor behind the migration of people to be near places of opportunity in the urban setting (Yimer, 2015).

According to Yimer (2015), the natural growth rate in the urban environment, economic growth, technological change and the rural-urban migrate rates are the leading factors in the causes of urbanisation. Factors that push the rural population away from rural areas is the serious lack of arable fertile land, climate change which results in flash floods and droughts, and the lack of clean drinkable water. The industrial wage and the availability of economic opportunities are the main contributing factors to the migration of people into the urban fabric, while the yearning for a progressive and non-oppressive live with access to health care and liveable condition is also an attraction.

The introduction of urbanisation has brought about some of the most significant changes to both social and economic institutions. The mode of city life was not only confined in city centres, but it also related to the people's interaction in that particular space. People who reside in densely populated regions often experience a sense of accentuated social frictions and instability (AlSayyad & Roy, 2004). It is thus important to look at urban regions in relation to the social relation responses of the people on the ground. Communities in general have an inbred culture of living and seeking to understand such social implications is imperative.

According to Smith (2005), apartheid was pivotal in mapping and influencing the obscure forms of urbanism in South Africa. This innuendo arose from the need to sustain and uplift white political power in the country. The escalating opportunities in the diamond mining industry during the 1870s introduced a large influx of foreign investment which in turn brought change in the pattern of the urban fabric. The transport routes between ports, agricultural and commercial centres influenced the size and character of the newly formed urban economy. This influenced the rural to urban exodus in the 1880, with urban destination ranging from short term to lifetime terms. The South African war of 1899- 1902, which resulted in the defeat of Boer republics, opened up an opportunity for annexation to Britain and the subsequent construction to an exclusive white vote, coupled with the seizure of land in 1910. This intention was to develop a 'native policy' whose consequence were to be seen and entrenched on a long term basis. The colonial government policies played a crucial role in the structural and regulation of urbanization in South Africa which included several restrictions towards the black populous. These policies relegated the black population to the peripheries of the urban fabric while allowing restricted access into towns and city centres. In conjunction to these policies of Apartheid, a grand apartheid strategy of dividing the black population into homelands based on their ethnic entities was also imposed.

Social policies were implemented during the democratic dispensation in 1994 in South Africa. These included the Reconstructions and Development Programme (RDP), GEAR policy and ASGISA policies. They were implemented to provide service delivery aimed at alleviating the disparities brought about by the apartheid planning policies. The high rates of urbanization and rise of informal settlements proved to be a

challenge for these policies to be implemented effectively. These challenges were coupled by the increased inequality patterns within the black African society. These included the high-rise in crime, poverty and unemployment (Muzondi, 2014). The development of informal settlements in the city is also a worldwide problem.

A lack of affordable housing gives rise to the urbanisation of poverty (Hofmann, 2015). The small to large land occupation results in the morphology of informal settlements having either a grid pattern, organic or irregular layouts. The rural to urban migration often leads to the occurrence of informal settlements on marginal land of the urban fabric which is a direct result of urbanization. A slum according to the UN-Definition has to satisfy five conditions for it to be considered a slum. These conditions include lack of tenure, lack of access to safe water, lack of access to improved sanitation non-durable housing and overcrowding (Hofmann, 2015: 1). It is important to forecast future informal developments before they happen.

Lious With wrote that the concept of urbanism in the late nineteenth century to the early twentieth century was the one of the “*most impressive facts of modern times*”, and these innovations had brought about significant change to the social and economic outlooks and perspectives (AlSayyad & Roy, 2004). This statement is a far cry to the atrocities that were brought on by the apartheid regime, which was influenced by the concept of modernisation trends within the theory of urbanism. For the purposes of this study, urbanisation refers to the movement of people from various rural communities around the country into the Greater area of Cato Manor and particularly the study area of Cato Crest informal settlement. The rise in urbanism in the past century within the Durban had not looked into properly accommodating the rural to urban migrating populous which gave birth to the informal settlements found in Cato Crest. The formation of informal settlements is a direct consequence to the lack of integration the concept of urbanism has on catering for other existing systems of African cosmology.

4.2.2 Informal settlements

According to the formal definition of the Informal Settlement Upgrading Programme (ISUP) in South Africa, the orientation used to define informal settlements is based on the following characteristics “(a) *illegality and informality*, (b) *inappropriate locations*,

(c) restricted public and private sector investment, (d) poverty and vulnerability and (e) social stress” (The Housing Development Agency Research Report, 2012: 12; The Housing Code, 2009; Ziblim, 2013: 7). This also includes the lack of basic services such as electricity, water and sanitation and the use of inferior building material.

The formation of informal settlements is a result of unauthorized occupation of land. It can also be attributed to the formation of industries and employment opportunities within the city centre. There is a deep connection that cannot be ignored between the formation and escalation of informal settlements, unemployment and the principles and concepts of urbanization. The emergence of new industries can have a positive and negative impact on the existing urban fabric. Critics on one end have concluded that the escalating urbanization scenarios can be a resemblance to the rise in economic and social advancement, while on the other hand; the escalating urbanization triggers an epidemic of informal settlements. The advancement of informal settlements can be attributed to the lack of planning strategies that can influence positive development (Muzondi, 2014).

Informal settlements have also been termed many phrases depending on the geographic location. Common phrases such as favela in Brazil, Mkhukhu and Hokke in South Africa are phrases used to describe informal settlements (Huchzermeyer, 2008). According to the Bureau of the Census and the U.S. Department of Housing and Urban Development, in the mid-1970s concluded that a building that lacked hot or cold water and flushing toilet, a building that was void of any electrical connections, a building that has exposed wires and no working wall outlet, a building that could not sustain any electrical appliances thus making it uncomfortable to reside in for more than 24 hours, a building that is not deemed structurally safe with no basic amenities for residents, is deemed a substandard household (Paul & Leonard, 1989: 31).

These are generic classifications for slum settlements. South Africa further developed a strategy that uniquely caters for experiences of its citizens. Poverty, vulnerability and social stress were also factors to be incorporated by the Department of Human Settlements when attempting to classify or define what a slum is (The Housing Development Agency Research Report 2012, 12; The Housing Code, 2009; Ziblim,

2013: 7). South Africa has chosen to use the term ‘informal settlement’ rather than slum dwelling when clarifying what an informal settlement is in terms of legislation on slum upgrading.

According to the World Bank Institute, the South African government has spent 44.8 billion rands on the national housing schemes. This money has been committed to building housing schemes for 2.3 million citizens since 1994 (WBI, 2011). This effort was partially meant to eradicate slums in the South Africa. However, the government is failing to meet the escalating numbers of shanty dwellings in South Africa. The formation of informal settlements comes with the demands to provide for service infrastructure delivery.

Densely populated informal settlements are most difficult to develop as lack of space compromises the erection of engineering infrastructure. The landscape in which some of the informal settlements are located makes it impossible to provide for in-situ housing units and engineering infrastructure. This prompts the relocation of some residents to spaces suitable for approved development. Therefore, it is important to reiterate that the improvement of informal settlements must be performed in cognisance to the existing urban fabric. Relocating residents of informal settlements can be seen as unfair as the relocation can sever established community ties. One of main causes for the rise in informal settlements is the backlog of allocation of housing and the rise in population. Areas with high economic opportunities contribute to the escalating numbers of informal settlements (Muzondi, 2014).

Socio economic factors and informal settlements have a deep connection in South Africa. One aspect cannot be studied without looking at the other. Socio economic factors also play a part in the delivery of service infrastructure and status of basic living conditions (Ziblim, 2013: 8). Apartheid can be attributed as being one of the many causes of the emergence of informal settlements, due to the unfair distribution of land based on race and class. Post-apartheid policies have performed unsatisfactorily towards amending this disparity. People are still being moved on the premise of redevelopment on land that they have occupied for years. Countries such as Brazil give security of tenure to people that have occupied land without any disturbance for more

than 5 years (Huchzmeyer, 2010). The South African government has implemented similar programmes of upgrading security of tenure, through initiatives such as the upgrading of informal settlements programme.

The affordability of houses has become a cost burden, particularly in South Africa. South Africa has a unique history due to apartheid, which has a direct effect on the affordability of housing, access to service delivery and ability of citizens to actively participate in the economy of the country. The characteristics of a poor household are mostly common. Poor households are small in size. These households are usually managed by women as single mothers with children in some areas; whereas in other areas, one may find that the household is managed by elderly women (Paul & Leonard, 1989: 18). Black tenants are more likely to be found in poor households as the apartheid regime hindered the social and economic progress of the black people. Black people live in crowded abodes that are not exclusively on par with government housing standards. In this economy, it is difficult to own property and people residing in poor households do not have the financial capacity to purchase and own property. People that live in poor households and in informal settlements do not enjoy the fruits of having security of tenure.

The development policies aim at creating liveable cities for all. However, strategies that incorporate and address the economic and social needs of the residents are needed. The rate of neo-urbanization has been escalating in the past 20 years, which resulted in urban fragmentation, segregation and class, which then impedes on positive development. The escalating urbanism causes environmental degradation, overcrowding and housing shortages. Informal settlements are built with material, which is not aligned with housing standards. Services such as water and electricity are connected illegally, which causes a security threat to life. These living conditions are not only a threat to the existing environment but they also threaten the health of people living in these settlements (Muzondi, 2014). The construction of housing facilities creates employment opportunities in developing countries and this can be viewed as an opportunity for good investment (Collier, 2014: 6). The rare of affordability within the city limits has encouraged people to build informal settlements to escape the expensive demand of the city.

One of the unfortunate paradigm of informal settlement dwellers is their relationship with poverty. A general poverty definition by the World Bank suggests that “poverty is pronounced deprivation in well-being, and comprises many dimensions. It includes low-incomes and the inability to acquire the basic goods and services necessary for survival with dignity. Poverty also encompasses low levels of health and education, poor access to clean water and sanitation, inadequate physical security, lack of voice, and insufficient capacity and opportunity to better one’s life” (World Bank 2011).

These poverty restrictions make it hard for investment opportunities to be targeted into these communities. There are weak social support networks and low financial capital, which is most prevalent in most informal settlements around the world. Globalization and urbanism can directly be linked to the escalating rise in informal settlements. The growing migration from rural to urban city life accentuates the common mentality of ‘the right to the city’ (Ehebrecht, 2014: 27-28). The word slum can be viewed as derogatory as it negatively classifies people who live these settlements. The word *mkhukhu* or *hokke* is used to describe a chicken pen in isiZulu and Afrikaans. To classify the settlements as *imikhukhu* relegates the residences of informal settlements to animals. Informal settlements are also not aesthetically appealing to some people. Some people go as far as seeing them fit for bulldozing. Informal settlements are also synonymous with poverty, ill health and disease.

A person’s attachment to a place can also have economic consequences. An attachment to a place can make the people residing in that place to economically lift the place to enable a competitive edge (Easthope, 2004: 9). On a positive context, informal settlements provide economic opportunities for those residing in them. They are strategically closer to places of work, schools and clinics. Some people who reside in informal settlements seldom use public transport to travel to places of work. They also provide rental opportunities for those looking for a cheap place to reside. Informal settlements provide a start-up shelter for the incoming migrating population who seek opportunities in city centres. City centres and medium to high-income population rely on people that reside in informal settlements for their service in the low-income job markets. Occupations such as informal labourers, barbers, domestic workers and day

labourers are some of the professions done by people who reside in the informal settlements. The informal settlement provides for a hub of labourers.

The resultant occurrence of informal settlements is a sobering resultant to the failures of the system brought about by colonial and imperial forces. Informal settlements in Cato Crest are a continuous reminder of the struggles of people who have migrated from the rural areas into what society deemed as places of opportunity. Residents of Cato Crest are made up of a myriad of people from all walks of life, from vast depths of the continent. Residing in informal settlements is the only choice they have in a society that categorises people by their economic and social standing. The concept of informal settlements within the study refers to understanding and defining the state of living abodes in the study area of Cato Crest. This will help conceptualize the origins, formation and continued existence of informal settlements, particularly with Cato Crest.

4.2.3 Sense of place

A sense of place is very important to any community. It gives the residents a sense of pride and identity. This concept is the catalyst that enables and provokes residents to protect and defend their place of residence. Shack dwellers had a sense of place and connection to Cato Crest. This was seen in their pivotal influence over advocacy issues affecting Cato Manor in the past. The collective strength of Shack dwellers shows the collective strength of informal settlement dwellers. People needed to be sensitized to the stigmas that surround the informal settlements. Shack dwellers association was a hope for the hopeless and an advocate for the voiceless. The group seeks to encourage the government to adopt a bottom-up approach. The threat of fires, bad weather, disease and lack of sanitation forces the people to stand up and fight for their human rights.

The concept of place has particularly to do with the interaction of people and the surrounding environment. This concept gain prominence in the 1970s as a way to address the interaction and relationship of people with their surrounding environment. The concept of place is very important as everything that surrounds has a benchmark that is place. The connotations, which are linked with place, can be paired with social constructs, economic situations, collective memory and identity. People in general will relate a host of memories with their identities to their place of residence and existence.

The realities can be directly related to the concept of place. There is also a distinct difference between space and place. People can also describe their place of residency as a home. This is due to the memories and the attachments that are linked to that particular place (Easthope, 2004: 1-2).

The people give a space meaning and thus defining it into a place. There is a created relationship with the place that can only be fully comprehended by the people that interact with the particular place on an everyday basis. The place is also personified as a person that can be spoken to, felt and interpreted. The constructs of places are largely disputed due to the forever-changing factors of the uncertain world and globalization. All things are possible through place and how society operating within the place perceives the place (Easthope, 2004: 3).

The idea of place is a useful concept as it allows the study of the relationship between people and the surrounding world. The study can go as far as analysing the perceptions created by people concerning the relationships they have with the surrounding environment. A bond is created with place by the sheer awareness the person has with the place of interest. This varies from individual to individual but collectively as a community, the bond and relationship to the place can be strong. The bond and relationship grows stronger with time because memories are formed with time (Easthope, 2004).

People can create a sense of place by the territorial instinct people innately have. It can also be created by a sense of awareness and a sense of identity. A sense of awareness and identity enables the people residing at that place to feel a sense of connection and belonging. With the escalation of globalization and class differences, there can be a trend of communities differentiating themselves based on the perceptions derived in the place of interest. Once memories are formed, people innately get territorial towards the identified place. This notion of territory escalates with the formation of threat to the place (Easthope, 2004: 5).

People can also exhibit a sense of commitment and pride towards their place of residence. This can go as far as people being prepared to die for their places. Their level

of comfort and commitment is directly related to their place (Easthope, 2004: 6). The existence of familiarity whether conscious or subconscious encourages a sense of place for the inhabitant (Easthope, 2004: 7). A home can be characterized as entity of socio spatial status that harbours both the physical and psychological matter of the people that exist within that space. The household can also be seen as the birthplace of most of the nostalgic memories of a place. Homeless people can view the complete spatial establishment that is place as their home. A home can offer a place of solitude and security much like how animals feel territorial about their space (Easthope, 2004: 8).

Abahlali Basemjondolo had a sense of place and connection to uMkhumbane. This was seen in their pivotal influence over advocacy issues affecting uMkhumbane. The collective strength of Abahlali Basemjondolo shows the collective strength of informal settlement dwellers. People needed to be sensitized to the stigmas that surround the informal settlements. Abahlali Basemjondolo was a hope for the hopeless and an advocate of the people without a voice. The group seeks to encourage the government to adopt a bottom up approach. The threat of fires, bad weather, disease and lack of sanitation forces the people to stand up and fight for their humanity. The existence of social activism groups can come in large or small groups, both on a formal and informal legislative nature. The layout of informal settlements makes it easier for activism and ideas to spread within Cato Crest. Cato Crest is part of the greater Cato Manor area, with many people being born and raised in the area. The research will test the residents' sense of passion and yearning for the improvement and installation of proper services in the area of Cato Crest. A sense of place generates a sense of entitlement, love and belonging, a feeling which emanates from a common township phrase spoken throughout all South African townships, "iKas' Lam" ,which loosely means my community.

4.2.4 The environment

The environment is term that may be defined as surroundings in which living organisms exist (NEMA, 2008). The environment consists of the land, water and the atmosphere of the earth. The microorganisms, plant life and animal species that resides with human beings forms part of the greater environment. The most important aspect of defining what the environment is the intrinsic relationship that human beings have with the

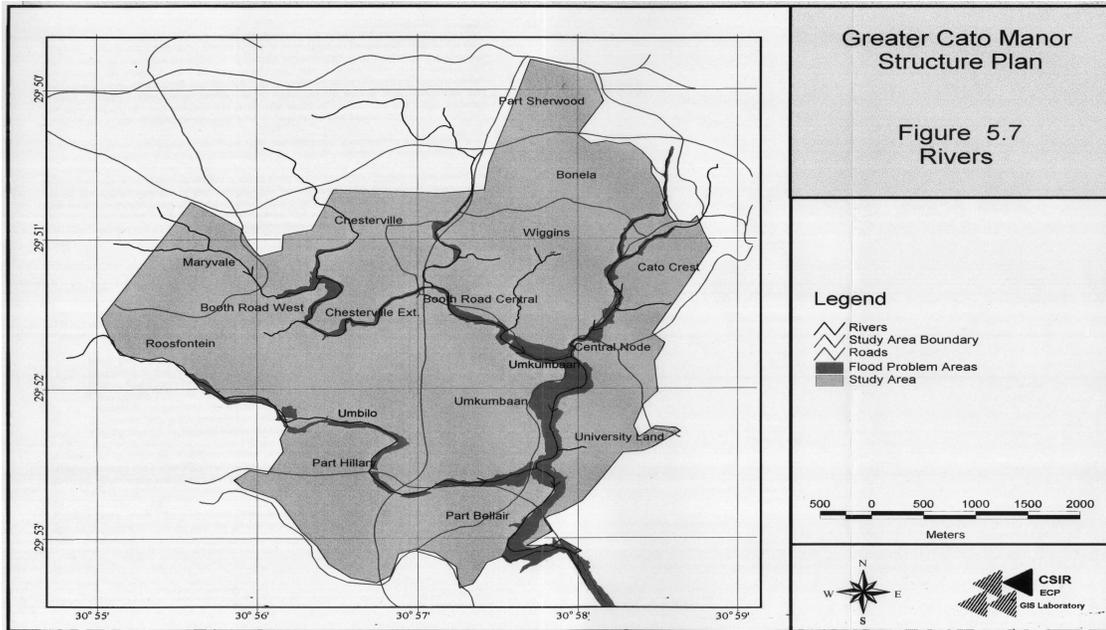
surrounding environment, which influences the wellbeing of all that exists in this world (NEMA, 2008).

According to Asmawi & Paiman (2016) “*Environmentally Sensitive Areas (ESAs) are defined as landscape elements or places which are vital to the long-term maintenance of biological diversity, soil, water, or other natural processes, both on site and in a regional context.*” It is imperative that society as a whole protects and preserves these fragile landscapes against any form of degradation as they provide heritage value and preservation of life.

According to the *Constitution of the Republic of South Africa, 1996* and the *Environmental Management Act 107 of 1998*, inhabitants residing in South Africa have a right to an environment which is not harmful to their health and wellbeing. The state is responsible in promoting, protecting and preserving the social, economic and environmental rights and strive to meet the basic needs of all those previously disenfranchised by institutional systems of the past (NEMA, 1998). Pollution may be defined as substances that change the natural order of the surrounding environment. These substances may come in the form of radioactive waste, noise, odours and or any other entity which may emanate from any storage which may negatively affect the natural order of wellbeing of both the human species and the environment (NEMA, 1998).

According to Hansson (2001), the watercourses in Cato Manor have an elevated level of microbial pathogens, which constitute to the risk of infectious diseases such as cholera and diahorrea. In 2001, people residing in Cato Manor suffered from a cholera outburst. There was a high content of faecal coliform bacteria in the uMkhumbane river network. These high levels of bacteria do not only affect the residents, but the various contaminations also affect the existing fauna. The notion and façade that the natural environment heals and self-rehabilitates is false and harmful.

Figure 4.1 River systems in the area of Cato Manor. The two streams within the study areas merge into the uMkumbane River: The Mayville stream follows on the border of Cato Crest and the Chesterville stream drains the area of Wiggins.



Source: Hounsome (1998)

The figure above depicts the Mayville stream and the Bellair stream which both drain the Northern part of Cato Manor. The Chesterville stream drains the western part and merges with the uMkhumbane river before it reaches the Bellair stream. These four waters make up the uMkumbane River sub catchment, which feeds into the Umbilo River from the North (Todd & Claasen, 2000).

Controlling the population in the defence of the environment can lead to conflict. This is due to the underlying factor that determines who is most important within the conflict. Previously colonisation did not only colonise the people, but the natural environment as well. The removal of people at the expense of the ecological entities makes it difficult not to associate the act of removal to be synonymous to the act of imperialism. Different people have different outlook on life. For instance, a farmer, a villager or a labourer might see the surrounding environment in different lights. It is important not to transgress different people into economic and financial commodities, as their day-to-day experiences will be misunderstood. It is important to understand that financial value is not restricted to monetary value. The value of land, property values and the ability to

cultivate the land also provides dignity to the people who are destitute. Controlling the environment means that their very livelihoods are being controlled. If the dignity of the people or community comes into question, the rights of people will be questionable and taken for granted. It is thus important that people's dignity and rights be implemented alongside the understanding of environmental human rights. The third world communities rely heavily on the availability of natural resources to flourish and survive (Sachs & Wolfgang, 2003: 9).

The extraction of raw materials is often the central contributing factor to conflict. The extraction of oil, the alteration of ecosystems such as dams, the reprogramming of nature in the form of genetic seeds and the destabilizing change of climate can all contribute to the displacement of people from their living space. The monetising of natural resources and pollution of rivers and living space contributes to the uncomfortable conditions particularly found in underdeveloped areas (Sachs & Wolfgang, 2003: 10).

It is important that the environmental conditions of an area be observed and understood. This includes the water quality, hydrology, landform and the terrestrial environment of Cato Crest. The terrestrial environment encompasses all amenities that ensure the survival of natural resources. These can include the air, soil type, fauna and various animals that influence the ecosystem within Cato Crest. Taking into consideration such amenities will ensure that all man made ventures exist in harmony with the existing natural environment. This will ensure that the natural environment is sustainable. The existing vegetation symbolises the food that natures the existing ecosystem. The condition of the vegetation gives an indication of the state of the environment within the area. The failure to monitor the environment will negatively influence the living conditions of both humans and natural organisms. The existing natural stream and biodiversity in Cato Crest also suffers as a result of the existing informal settlements. Therefore, the study seeks to unravel whether or not a symbiotic relationship can exist between the natural environment and the residents of Cato Crest.

4.2.5 Sustainable Development

There are numerous definitions of sustainable development. Sustainable development is commonly defined as “a process of change in which the exploitation of resources, direction of investments, orientation of technological development, and institutional change are made consistent with future as well as present needs” (WCED 1987: 9; Banerjee, 2003). The word sustainability and sustainable development in society are used interchangeably, and one of the debates about sustainable development is its subtle insinuation that the certain social orders need to be sustained thus taking precedence over the existing environment (Banerjee, 2003).

Sustainable development can be classified into many concepts. One of the main concepts of sustainable development is the goal to combine environmental issues with socio economic issues. Sustainable development aims to challenge and change issues that negatively affect both the current and future generations. Sustainable development must provide for sustainable livelihoods while catering for environmental stability and sustainability (Hopwood et al., 2005: 1).

Sustainable development has three pillars, mainly an environmental, economic and a social component. It is important that these systems are understood and exploited to their fullest to achieve development that will sustain the generations to come. The movement of environmentalism came about in the 1960s as people were waking up to the negative effects of industrialisation and urbanisation (Elliot, 2006). People started to view themselves as more connected to nature and the surrounding natural environment. There were environmental awareness campaigns that analysed noise pollution, air pollution and land pollution. With the support of the media, these movements were supported by the masses contrary to before when environmental activists were seen as radical tree hugging fanatics. The awareness particularly came to effect because society became aware that human survival depended on the environment. In America during the 1960s, the environment and Vietnam were the biggest issues concerning the young generation of that time (Elliot, 2006: 25). Urgent environment conservation parameters needed to be implemented in order to protect the endangered environment. Developing nations at that time saw little need to follow suit as most of these nations had just received their supposed independence. Developing nations were also a bit sceptical to

these western developments as little could be done to control the impoverished people looking for resources (Elliot, 2006: 31). Development and the conservation of the environment were seen as contrasting entities. The environment was seen as a finite resource and the industrials and urbanism were seen as part of an inevitable trail of life.

The term sustainable development is contradictory as it seeks to find equilibrium between sustaining and damaging the existing environment. The term is loosely coined to help the ecological stability of society. The term however seems to protect more the economic stability of developed nations while having control of environmental resources. The change of the term 'nature' to environment has helped the first world politicise and colonize natural space. Controlling the environmental or natural space has also allowed the control of development to proceed in a way the developed nations see it fit (Banerjee, 2003: 143).

A robust discussion on how sustainable economic growth can be achieved without environmental degradation is needed. It is also critical to have a concise understanding as to what is being sustained, if the world is sustaining development, the economy or the environment? It remains controversial as to how these three entities can be sustained and satisfied simultaneously (Banerjee, 2003: 144). Sustainable development can be viewed as a tool to protect first world economic advancement. This is usually at the expense of the third world. Development has also been implemented in a totalling paradigm, which marginalises those that are impoverished and disempowered (Banerjee, 2003: 144).

The perception change of the word nature, which is deemed as wild and untamed, to the word environment, which is manageable, must be scrutinized. There needs to be a line of accountability for the countries that continue to enforce the notion of development at the expense of natural resources. Developed countries seem to want to blend economic and environmental benefits simultaneously.

It is imperative that the lives of the people residing in informal settlements are integrated into the greater urban fabric. This will ensure that previously disadvantaged communities that were excluded socially, economically and spatially are incorporated

into the existing urban fabric. The in-situ upgrading policies are aimed at ensuring that the best practices are implemented to incorporate a spectrum of tenure and housing policies. The reaction to informal settlements should be proactive and responsive. There needs to be cooperation and dialogue between involved stakeholders. This will lead to stabilized integration of various forms of residential settlements into the broader urban fabric. The upgrading of informal settlements should be flexible to accommodate local circumstances. The upgrading strategies should be broad and area wide. These processes will include community liaison, security of tenure and partnerships with various private and government entities (Breaking New Ground Policy, 2004).

Sustainable development has been critiqued as a tool used by capitalist imperialist forces to advance themselves through the demise of others. This can be seen through the policies of apartheid and their lack of inclusivity while sustaining a bright future for those of European descent. This shows that sustainable development can also be used as a subtle tool of oppression. Sustainable development principles will only work holistically if all echelons of the society are included and accommodated. The formation of informal settlements in Cato Crest and across Africa was a consequence of sustainable development principles which basically allowed developers to leap frog across communities and have control of the environmental degradation caused by development. The study seeks to unravel whether the principles of sustainable development have been successfully implemented in the area of Cato Crest informal settlement. Has the municipality successfully implemented the inclusion of existing informal settlements into the greater urban fabric, reversing the ills brought on by the apartheid system? Have the concepts of sustainable development of providing sustenance to both the natural environment and the residents of Cato Crest been successfully implemented?

4.3 Theoretical Framework

4.3.1 Bronfenbrenner's theory of human ecology and development

Urie Bronfenbrenner argues that in order to understand human development in a particular setting, it is important to have an understanding of the environment and the entire ecological system a particular person or community lives in (Härkönen, 2007).

These systems help to grow and guide the human growth. These systems are embodied in the everyday living of the person, such as the immediate environment, schools, families and the economy. Ecological models mould and develop human beings. Bronfenbrenner's models of work are based on research conducted by various institutions, beginning with a study in Berlin on the effects a neighbourhood has on the development of children's concepts. The ecological paradigm was introduced in the 1970s, which was criticized by saying that the science of development psychologists was aimed at reading reactions of children and adults when placed in strange situations for a brief period.

It is important to note that the model deals with two specific phenomena, which is development of the human biophysical characteristics over time and the scientific tools used to evaluate, assess and monitor the change and continuity (Härkönen, 2007). These two statuses are important and must be implored simultaneously to achieve the desired results as the human develops in a path of discovery.

An early critical element of theory is notion of human experience which usually has subjective connotations. The environment is changed and perceived differently as the human develops. These experiences are unique and subjective to the changing environment and development of the human being. The human development takes place over a period of time. The effects of the surrounding environment must happen over reciprocal active intervals (Härkönen, 2007).

Bronfenbrenner was a leading figure and author in the field of development psychology. He defined four concentric systems that exist within the ecological systems theory. These were microsystems, meso-systems, exosystems and the macrosystems. These systems stress the importance of a child's development due to the quality of the surroundings. The child's interaction to the surrounding environment is both unique and complex; it grows and matures with time. Bronfenbrenner argues that the existing environment influences the behaviour of its existing inhabitants. The word ecology stems from the words oikos (house), environment and logos (knowledge). There is a dependency between man and the environment (Härkönen, 2007).

Socialization is an intricate part of the relationship between environment and man. Socialization is seen as part of development. It describes the ecology of human development that turns man into a constructive member of society. Development and socialization are factors that are influenced by the surrounding environment. This notion is also encompassed by three assumptions which are:” 1) person is an active player, exerting influence on his/her environment, 2) environment is compelling person to adapt to its conditions and restrictions and 3) environment is understood to consist of different size entities that are placed one inside another, of their reciprocal relationships and of micro-, meso-, exo- and macrosystems” (Bronfenbrenner, 1979; Saarinen et al., 1994: 88). The person is influenced by the pattern of activities, roles and interpersonal experiences within that particular environment. Microsystems include the structures that the child connects with on a daily basis. The theory also stipulates that there exists a bi-directional interaction within the environment. A bi-directional relationship is where an entity that has the potential to influence can have its presence influence the surrounding environment. These influences can be simultaneous and co-existent (Härkönen, 2007).

A microsystem is made up of the closest surrounding systems within that particular person’s life. This could include a courtyard, classroom or a neighbourhood. A child’s microsystem can be made up of immediate close family members. The idea of a microsystem is not about geographic but rather that person’s interaction and participation within that system. A family can be referenced as an ecological reference framework; it however does not mean all family members participate within a person’s microsystems (Härkönen, 2007).

A mesosystem comprises of linkages and processes that occur to the developing within two or more settings. This could include developing person’s workplace and place of residence. Mesosystems are the connections that link the developing person’s microsystems. It also important to distinguish the relationship and level of support that exists between microsystems. The study of microsystem must not be limited to microsystems in isolation, but their joint influence must be explored as well (Härkönen, 2007).

The exosystem comprises of the linkages and processes of two or more instances that do not necessarily involve the developing person. A typical example would be the relationship between a parent's work place and a child's day care centre. This means that certain environments that a person is not present in may be indirectly influential to a developing person (Härkönen, 2007).

The macrosystem was influenced by Vygotski's theory about the relationship between aspects of history and social evolution. It forms the blue print of a broader social context. It is a conglomerate of all systems but also comprises of social aspect that includes life, culture, lifestyles and opportunity structures to name a few. It holds the developing person's cultural values, traditional systems and social values. Macrosystems can be viewed practically by the comparison of two developing people of different society. The Chronosystem affects the dimension that is time; time influences the past, present and future. Time can affect the environment's progress and changes (Härkönen, 2007).

The ecological theory underpins a child's development in reference to its environment with a strong emphasis on the quality context of the child's surroundings. The complex nature of the environment of Cato Crest informal settlement has an effect on the growth of the children that interact with the environment on a daily basis. The pollution and structure of the informal design of the shacks has a complex relationship with the child on physical and cognitive level. Lack of land to build on produces an urge to defend and expand the informal settlements within Cato Crest, which unfortunately cause the residents to lose focus on maintaining a positive social structure. The researcher also examined how the residents of Cato Crest have acquired over the years a more extended conception of the surrounding environment and become motivated to engage in initiatives that will improve, sustain or change the surrounding environment into a more complex form. Bronfenbrenner's theory links education as a primary link in which people can be influenced to engage with their surroundings on a deeper level. The research will try to find if there are any initiatives, particularly by the municipality aimed at changing the psyche of the residents of Cato Crest to engage with their environment on a more positive orientation. In order to further understand this phenomena, a thorough exploration of the environment, the residents of Cato Crest and

the relationships between the latter and former need to be explored. Bronfenbreener's theory also theorizes that the humans are not only the product of their environment but are also the developers and moulders of the environment that influences them (Bronfenbreener, 2005). The process of development and the recognition of culture and subculture was a later modification made on the theory on the parts of the macrosystem and the chronosystem. The final phase of maturation of the theory was the consideration of the proximal process as a driving force to the development of human ecology (Bronfenbreener, 2005).

This theory speaks to the ecological evolution and experience of people residing within this informal settlement of Cato Crest. The surrounding environment at to Cato Crest will in many forms influence the behaviour of the community, both direct and indirectly. The influences of the surrounding environment will affect the old and young. Correspondingly, this research analyse how extensive is the influence of the surrounding environment to the people living with the Cato Crest and vice versa.

4.3.2 Development theory

Development took a significant rise after the Second World War. This was due to the new challenges which necessitated rebuilding countries which were shattered by the Second World War. The World Bank previously known as the International Bank for Reconstruction and Development was created to manage and facilitate the process of rebuilding countries destroyed by the war. This process then formed theories of development based on the challenges faced by various regions in these countries. Another driver of development was the prominent movements of industrialization. African regions at the time were unhinging from the grip European colonialization; these underdeveloped African regions, according to western normative concerns, were eager to speed the acceleration of development (Rapley, 2007).

The characteristics of development theory are that it is problem driven rather than it being theory driven. This makes the theory reactive rather than proactive. This is one of the reasons why theory of development does not hold high regard in the world of social science academia. Development theory also caters for a certain class, political and cultural interests. Various communities have different perspectives depending on whether the development speaks to their interests or not (Pieterse, 2010). Development

was used to manage colonial interest, as is the case in the present day. Imperialistic colonial powers exported raw materials to industries in metropolitan countries; this trend is still common today though existing in subtle yet influential tones. The introduction of British colonialism in India destroyed its native textile industries. One of the main interests of development in the past was the exploitation of a meek people for imperialist interests. Development is reactive as corrective measures are now instilled to counter these past atrocities.

One of the critiques of the development theory was its simple minded determination to develop all nations at the expense of livelihoods of people. Development brought destruction and abuse at the expense of capitalist interests. Normative way of life was changed in order to enforce a new status quo, all in the name of development. Developing underdeveloped countries has proven to be a double edged sword for the local residents since the affordability of infrastructure built by foreign conglomerates has not been priced for within the affordability limits of local residents.

Development theory speaks to the critique and revision of past frameworks and theories relating to development. It aims to analyze and revise the summations of what development had been defined to be. Development has been argued as belonging to the school of social science, others have argued that development has deep roots in the school of politics. Politics has been seen as pivotal in influencing the direction of development as compared to the theoretical approaches formulated over the years. This plays down the notion that development theory can be an intellectual process. It can therefore not be feasible to isolate development theory from both the school of intellectual thinking and in the chambers of politics. Development theory cannot be analyzed in isolation. Development is sustained by social values and demands as demanded by different people of different realities. Development does also have an air of neo-colonialism as it favours the capitalist trail at the expense of the underdeveloped (Pieterse, 2010).

Development relates not only to developing countries, but it forms a pivotal pillar in the global cities of the developed world. It is a measure of how far the human race can go in achieving their aspirations and targets. In the 1908s, development was not only regarded

as an ingredient for economic growth, but it was also regarded as a concept that improved the social aspect and material wellbeing of society. Development was meant to encompass the economic, social and environmental interests of the population in a sustainable manner (Elliot, 1994). Globalization is becoming the standard method of classifying the level of advancement in development. Countries all over the world are trying to become developed and up to par with the standard of development enforced by global cities. Modernity does not cater for the surrounding natural ecology. Development has come with deep and negative consequences, particularly in the developing world. Development should be viewed as a double-edged sword. It has both put societies on high pedestals and the natural environment on the crumbling edge. Development has had commendable achievement, but it has come with negative consequences. It would not be wise to scrap the notion of development altogether, the idea to have an improved concept, which cater to post-development, will need be conceptualised and implemented. Development was a reaction to the ever-escalating rate of industrialization during the nineteenth century (Pieterse, 2010).

Development emanates from entities such as government groups, no profit organizations and people looking to benefit from the proposed developments. There exists a difference in the realities of presence of development in high-income societies as opposed to low-income societies. The word develop can be loosely translated to a change that happens gradually. A progress happens gradually with some sort of improvement in the end.

The term development during the 1940s was a term less frequently used to describe any improvement made to the living conditions of society. People in the developed world saw underdeveloped countries in the third world as primitive and in need of civilization. Development in those days was aimed at the securing of natural resources. After the Second World War, developed nation saw the importance of developing for both the social and economic needs of society (Conyer & Hills, 1984).

The Basic Human Needs Approach is regarded as a concept within development that ensures that the needs of the people are met. Three basic needs were identified in the 1970s as needs of the population. The consumption of goods such as food, clothing and

shelter, the access to basic services such as water, education and health, and the opportunity to participate in the development opportunities are three categories that are regarded as basic needs of development. The shortcomings of this theory are that there are varying definitions of what basic needs are comprised of. The success rate of this theory will be the willingness of the minority to share resources with the poor (Conyer & Hills, 1984). The term development has a lot of myths and illusions attached to it. The definition of development is synonymously linked to growth. Development has also been loosely defined to be associated with anything that grows (Perroux, 1983).

This theory is relevant to the study as it aims to unpack the negative impacts of development. One of the main reasons behind the emergence of informal settlements was because of the imperialistic approach which development had and still has. The principle of the theory seeks to ensure that the needs of the population are met. This research seeks to answer whether or not there is at least an attempt by the municipality to meet the three basic needs of development, which are namely; the access to basic services, shelter and the opportunity to participate in opportunity driven initiatives. The use of the theory seeks to understand how development has impacted the community of Cato Crest. The theory helps to understand how the emergence and current existence of development has affected the social, economic, ecological behavior and the sustainability of the existing environment within the area of Cato Crest. The researcher also aims to explore the extent of damage development and post-development has caused at the expense of ordinary lives sacrificed on alter alters at the sake of national freedom.

4.2.3 New Urbanism

New Urbanism is a movement that helps address the suburban sprawl and inner city decline; this will in turn help to rebuild towns, cities and neighbourhoods (Bohl, 2000). The theory takes on from Clarence Perry's concept of the neighbourhood unit, but with a newer look that encompasses the needs of traffic volumes and changes in residential and industrial needs. These were adapted to fit the contemporary lifestyle of automobile and housing designs prevalent in the present day. In 1996, Secretary Henry Cisneros signed a CNU charter symbolising the shared principles of New Urbanism (Bohl, 2000). Both the Inner-City Task Force and a Community and Social Equity Task Force were

tasked in designing and implementing New Urbanist principles geared specifically for inner-city applications (Bohl, 2000).

New urbanism has been considered an important movement in American in the areas of urban design and architecture. It has been on par with the garden city movements which have been prevalent since the early twentieth century (Vanderbeek & Irazabal, 2007). The movement has continued to grow within the Congress of New Urbanism (CNU). The theory aims to be a direct opposition to modernist thought (Bohl, 2000).

It is important that sustainable ways of living are formulated which will in turn enhance and improve the quality of the existing environment. New Urbanism takes aim at approaches that have scattered humans into the present urban era. The theory aims to guide planners into achieving modes of design that speaks to both sustainable environmental and development practises. Due to the rise in the use of automobile in the cities, it is imperative that new outlooks are formed, which will zone spaces based on the usage and separation of house, work and free time (Rahnama, 2012). From the 1980s, Americans have presented theories, which speak to the wear and tear of the urban fabric of the city centre and the mounting increase in societies developing in the outer skirts of the city centres. This movement caused the development of new urbanism theories, which catered for this changing paradigm. The neighbourhood design has been part of the new design in the late twentieth century, which was based on humanistic urbanism. The theory seeks to cater for humanistic needs while providing for sustainable development. The theory makes use of walkability and connectivity. The street designs should be appropriate for pedestrian and motorists with adequate street furniture. Mixed use and diversity should be incorporated into the urban and architecture design. The designs aim at having liveable housing abodes that are connected to places of work and mixed use areas.

New urbanism recreates the modern village by implementing a compact design where there is a mixture of residential, recreational, civic, schools and other elements present. It also grants the inhabitants with access to amenities without the use of the automobile. It encourages a living space that is both liveable and comfortable to reside in the movement of new urbanism also go on par with the development of garden cities.

Urbanism can be summed up as a beacon of light toward progressive development. The theory promotes community participation, socio economic integration and environmental conservation (Vanderbeek, 2007).

New Urbanism theory was formed to enhance the quality of the urban environment. With the escalation of industrialisation, it was imperative to formulate a spatial planning approach that was going to accommodate the changing paradigms that came with modernity. New outlooks had to be formulated to accommodate the new usage zones and new separations based on places of work and residency. The utilisation growth of cars in society caused the decline of city centres with the formation of suburban and local societies in outskirts of cities. This new movement of a formulation of theories around New Urbanism was an attempt to solve the escalating problem of wear and tear in the city centres (Rahnama, 2012).

The theory enables modern principles to be implemented to improve the existing urban fabric. The theory also uses traditional methods, which were more mechanical, with a more humanistic perspective. The concept of new urbanism attempts to connect and blend the natural environment with the human man made environment in order to provide a sustainable environment for all residents. It attempts to make a system that promotes liveable conditions for all. The theory designs the environment based on the existing infrastructure and topography to promote a sustainable living environment. It also attempts to make an environment that is both comfortable and convenient for pedestrians without straining the automobile industry. It also provides for integration of different forms of residential settlements that supports people of different incomes (Rahnama, 2012).

New Urbanism is a theory that speaks to the liveability of human beings alongside an environment which is economically and socially conducive to progressive living. The study area of Cato Crest informal settlement is an area whose underlying blue print does not encompass the principles of new urbanism. The area of Cato Crest is a personification of struggle, density and oppression. Designing on top of an existing fabric such Cato Crest to produce an environment conducive to progressive living is a challenge on its own. The theory poses a challenge to the principles of New Urbanism

which speaks directly to ecological influences of human behaviour. The original design of Cato Manor and the subsequent emergence of Cato Crest clearly show a selfish drive for profit and control from the perspective of the apartheid government and that of survival, particularly for black people. The principle of an enhancement of the quality of living will further be analysed in the environment of Cato Crest, which will look at the level of improvement in the municipality achieving improved town planning designs that incorporate sustainable environmental and developmental practises. New Urbanism principles seek to unravel whether or not the designs and principles of incorporating automobiles and walkable spaces has been achieved within the community of Cato Crest. The neighbourhood concept also looks into the incorporation of focal points and nodes of learning, shopping and transit points (Bohl, 2000). The existence and the influence of such nodes will be explored during the research process.

4.4 Conclusion

This chapter has shown that theories and concepts greatly influence the paradigm of a community. The rate of urbanization has largely influenced the rise in population in Cato Crest informal settlement due to the opportunities offered by the urban fabric, particularly in the eThekweni CBD. The introduction of urbanism can be defined as a double edged sword which provided means for economic and social growth to the detriment of the natural environment. Poverty and social stress are contributing factors to the rise of informal settlements, which become almost impossible to development due to the topographical location. The densely populated informal settlements in Cato Crest make the erection and installation of engineering services close impossible. Sustainable development principles seek to find equilibrium in sustaining the environment in an economic, social and environmental perspective. The New Urbanism concept seeks to work alongside sustainable development policies by aiming to address urban sprawl and inner city decline which will upgrade the modern village into a more innovate and liveable environment.

Chapter five: Literature Review

5.1 Introduction

This chapter seeks to examine the relevant literature available in the study of informal settlements in relation to the natural environment. Literature on the environmental state of lands inhabited by informal settlements will be reviewed on a local, national and international perspective. This chapter also introduces housing policies such as Breaking New Ground policy that facilitated the delivery of human settlements in South Africa. The role and mandate of advocacy planning and communicative planning alongside the roles played by advocacy groups in the area of Cato Manor will be examined. Precedent studies of the favelas in Brazil and the informal settlements of Kenya are also reviewed in this chapter. These studies were selected due to their relevance and the information they bring into context with regards to the objectives and aims of this study. This chapter will provide a review on the challenges faced within the informal settlement environment which include waste disposal, access to essential services and environmental degradation in the context to the status quo of Cato Crest informal settlement and the state of informal settlements internationally.

5.2 Literature review in the international context

The progress of development has not alleviated poverty, particularly in countries defined as third world. This is because development protects economic interests more than changing the status quo of the societal issues (Banerjee, 2003: 1). The advancement of technology, the sciences, the education system and industrialization has come at a huge price, particularly to the degradation of the natural environment. The human population has suffered tremendously with the advancement of industrialization in the past 200 years and the advancement of development in the last 50 years (Banerjee, 2003: 143).

This section of the literature reviews the state of affairs of informal settlements and the challenges the inhabitants face with regards to this occurrence on a global perspective. The purpose of this literature is provide a comparative study to the challenges faced by the international community with regards to access to water sources, the symbiotic

relationship of human beings with the natural environment and the management of informal settlements.

5.2.1 Origins of International Environmental Conservation

The United Nations Millennium Development goals seek to provide significant improvements to the livelihoods of people residing in informal settlements. The goals can be followed through the following implementations; (1) Eradicate extreme poverty and hunger, (2) Achieve universal primary education, (3) Promote gender equality and empower women, (4) Reduce child mortality, Improve maternal health, (5) Combat HIV/AIDS and other diseases and (6) Ensure environmental sustainability.

Environmental challenges are firmly embedded into three core concerns for a solution based approach, namely the ecological effects of industrialization, the ecological effects of poverty, and the political tension between developed and developing countries (Ivanova, 2007). The effects of industrialisation had left North America and Europe in burning oiled rivers, deforestation and toxic chemical that were causing mutants amongst the animal species. The western and developed world saw the need of formulating social awareness of the implications development and capitalist's movements had on the existing environment. This movement transpired in the 1960s while developing countries were in the process of securing political power and the world's environmental agenda was not high in their plan of action (Ivanova, 2007). African countries saw the western world's clean environmental approach as a way to curb them from being a formidable force in the international industrial community. The African social community was plagued with poverty, lack of sanitation and access to clean water; this was one of the pivotal reasons behind the manifestation of the degradation of the natural environment. The African countries saw the stringent environmental standards imposed by the western world as a coup to overstep developing countries (Ivanova, 2007). Some African leaders argued that each country had the right to evolve at its own pace and exploit its own resources within the parameters of its own localised standards. The conference in Stockholm eventually convinced African leaders to assimilate to the global orientation of environmental thinking (Ivanova, 2007). The western world convinced African leaders that

development is not opposed to the preservation of the natural environment but should be viewed as part of the process of development.

5.2.2 The challenges of informal settlements in an international context

The World Urban Forum (WUF), which was established by the United Nations, described informal dwellings as “*a wide range of low income settlements and/or poor human living conditions*”. Informal settlements in countries like Egypt have two characteristics namely the physical condition and the legal status of the settlement (Nassar & Elsayed, 2017).

Low-income households in urban communities suffer the most when it comes to the scarcity of the delivery of water services. The lack of sanitation, uncollected waste, contaminated food and wide range of insect vectors contributes to the high levels declining health conditions found in informal settlements. The access to water within informal settlements needs to be regulated as resources are not readily available in limitless quantities. The escalating immigration of people has a negative impact on both the existing natural environment and the livelihood of those residing within the informal settlements (Hansson, 2001). This scenario leads to residents finding unconventional methods of accessing natural resources. This may include the cutting of protected indigenous trees and encroaching into sensitive habitat, disturbing the various existing species and fauna. Better management of low-income communities begs for the harmonization of social, economic and environmental aspects that affect these communities. Improved methods of resource delivery can help encourage a symbiotic relationship between the residents and the existing natural environment, which will in turn help sustain the existing natural environment for future generations. Having sound and workable water treatments can help curb the contamination of existing water resources. The management of water treatment can have a ripple effect in minimizing health hazards by contaminated water (Hansson, 2001).

5.2.3 Africa's development

Africa has experienced the highest growth in social, economic and property administrative development (Yimer, 2015). It has experienced the largest growth in the past two decades and this growth is expected to hold up steadily up until 2050. The rate of urbanization is lower in the Sub Saharan region as compared to Northern Africa. This change can be attributed to a surge in the development of technology, rural urban migration patterns and rapid population growth. The economic growth can accelerate the industrialization process of society, which in turn causes an uncontrollable growth in urbanization. This uncontrollable growth can cause a degradation of environmentally sensitive areas and natural habitats (Yimer, 2015).

Urbanization can influence the current globalization phenomenon in both economic and social perspective. Cities are known as places of significant change that offer multiple opportunities to migrating residents. The social and economic interdependence with urbanization can further cause pressure on the existing natural ecosystems and resources. The rapid urbanization growth in Africa has caused an incontrollable rise in informal settlements and urban poverty. The Gini coefficient in Africa remains the second highest in world. Inequality is a hindering factor in development as the policies in Africa have not been inclusive in the past. Access to basic infrastructure in Africa is still accessible to the more privileged (Yimer, 2015).

According to Yimer (2015), one of the main causes of the rapid rise in urbanization is attributed to rural urban migration. Circumstances in the rural areas force the residents to migrate to places of opportunities in the city centers. Other factors that prompt the migration are the lack of arable land for crops, lack of infrastructure and local economic decline. The wages earned at urban areas far exceed the wages earned in rural areas. The facade of better access to facilities such as clinics, hospital and education are an attractive dream to those migrating to the city. The problem that people face in the cities is the increased poverty and access to financial resources. The lack of tenure security and the expansion of informal settlements increase the insecurity of residents. The lack of infrastructures such as water and sanitation increases the rise in environmental diseases and illness. The pollution of natural streams causes a decline in health as disease such as cholera become rampant. The lack of proper sanitation and water

infrastructure contributes to the rise of these diseases in the developing world. Upgrading informal settlements has been incorporated into the reforms of policy in the developing world. This aims to integrate and facilitate the development of infrastructure to better the lives of the previously disadvantaged, the elderly and the poor. The reforms should encourage inclusivity amongst citizens regardless of race, sex and age.

According to Potts (2015), studies have confirmed that a decrease in urbanism is rare in sub-Saharan Africa. Most countries in Africa have recorded a steady increase in urbanism with the exception of Zambia, Côte d'Ivoire and Mali. Countries with a steady increase include Benin, Mozambique, Senegal, Zimbabwe, Mauritania, Burkina Faso and Niger. A steady decline in urbanity is credited to the rapid decline in opportunities. This also reflects a crisis in the escalation of poverty and lack of security of tenure. Most policies that are implemented do not cater for the rampant economic problems faced by people living in sub-Saharan Africa. The migration of people in most Asian countries has been coupled with opportunities. This has not been the case in African countries. The migrations of people within an African setting are not met with the same economic opportunities. The massive shortage of jobs means that people seeking opportunities can only find job opportunities in the informal job sectors. These informal jobs do not offer security or a reasonable income. This makes the economic geography of Africa very different to other regions of the developing world. The population growth rate also affects the migration patterns of people. Population can be influenced by mortality rates, births and infertility. Child and infant mortality rates influence significantly the population growth in most African countries.

Communities which are most affected by climate change are found within the informal settlements and low-income sector. The community of Uganda has to respond to the growing resilience to the changes that come with improving the urban fabric (Dodman, 2015). This includes improving subsidiary infrastructure and building materials for low-income structures. These changes do not only affect the individual, but they also affect the community and the city at large. These changing factors also respond to the changing climate. The Ugandan climate provides for vibrant sectors in Agriculture, water sources, fisheries and tourism (Dodman, 2015). These economic sectors are dependent on the tropical climate, which has Uganda experiencing floods and droughts

alike. These severe weather patterns have an effect on the social and economic sectors within the Ugandan society. These changing climate patterns influence access to food and human settlement in both the rural and urban settings.

The proportion of the population that lives in the urban areas has risen over the decades in Kamapala. The urban population is also growing faster than the national population. There are a high number of urban residents that live in informal settlements. These residents also form part of the population that earns low income. The residents in the informal sector are also the first people to be affected by floods and access to clean water. Studies of the capital city Kampala show that informal settlements form 21 per cent of the total city area. These areas compete on a higher level for basic amenities such as water and food as compared to medium to high income residents in the urban fabric of the city (Dodman, 2015). According to Rasmussen (2012), since 2007, 50 per cent of the world's population is urbanized, while a third of this urban population lives in areas that are classified as "slum" areas. The city of Dar As Salaam emulates the same constraints experienced by most cities in Africa. The city is made of 75 per cent of areas that are considered informal settlements. The growth of the city was predominately denominated by unplanned residential houses.

5.2.4 Resilience Movement

Resilience within the population of the shanty dweller is dependent on the active participation and involvement between the dwellers and the authorities. The government alone cannot achieve a satisfactory level of resilience. Hence, government should actively partner with community members and other relevant stakeholders. Resilience is aimed at lowering the shock effect of the consequences of climate change while previous methods looked at retaining the same function of things rather than accommodate, anticipate and absorb the crises. The city resilience model can be broken into four elements namely; health and wellbeing; economy and society; urban systems and services; and leadership and strategy. All four elements affect the informal settlement residents in one way or the other. These elements also add to the livability, security and health of the residences (Dodman, 2015).

The aim of resilience movement is to speak to the broader spectrum of people across cities and towns. The movement of awareness is very important as it will have a ripple effect on the mitigation parameters implemented to counter the challenges faced by residents of informal settlements. The shack dwellers international (SDI) boasts a span that crosses 33 countries with a local group being formed within Uganda. These initiatives seek to work closely with government departments to establish localized communication with the affected people on the ground (Dodman, 2015). These organizations mobilize the community in an attempt to cater for an inclusive city that will provide for better living conditions. The organization also aims to support a grassroots agenda by emphasizing community projects implemented to improve the living conditions through livelihood funds. These funds function as cushions during times of shock or slum upgrading. The method also transgressed to other towns with the form of communicative concepts. Echelons of leadership were established to ensure longevity of positive initiatives aimed at building the residence living in slums. Together with the government, leaders are able to formulate localized solutions, which are firmly rooted at eradicating poverty within the slum settlements. With such initiatives, residents can attract loans and investment funds to develop the informal settlements. Community mobilization is fundamental to establish the core problems within the community. This is achieved by gathering solid problems and solutions are generated (Dodman, 2015).

Cities abroad have changed significantly in the past 50 to 60 years (Hogstola, 2015). A city is changed by the change in the attitude of its people. The city also defines who the residents are and identifies the problems faced by that society. The manufacturing of the car industry propelled people to live more in the suburban areas rather than on the outskirts of the city. The city of London in its early inception was a city of unemployed and poverty-stricken residents and the countryside represented fresh air and health. The implementation of garden cities became a norm where the garden city was designed to be self-sufficient and manageable. The aim of the implementation of the garden city was to marry the countryside with the city life. Due to the environmental constraints brought forth by the garden city model, the neighbourhood model was implemented in Europe. This concept promoted integration of resources and the relationship between public and private space (Högskola, 2005).

5.2.5 Brazil: The history behind the emergence of the Favelas

The term favela is a pejorative and insulting term meaning ‘a settlement with jerry-built shacks lying on the outskirts of a Brazilian city’ (Webster’s Dictionary, 2017). The word jerry built shacks is inaccurate as most settlements within the favelas are built on brick and mortar (Perlman, 2010). Some of these informal settlements are built on the hillsides, marshes, near garbage dumps and other undesirable locations within the city centre. This is contrary to the belief that the favelas are on the outskirts of the city.

The urbanisation process in Brazil started in the 1950s with the expansion of the favelas and escalation of informal settlements on the outer skirts of the city (Fernanda & di Villarosa, 2012). The policies of the 1960s were implemented simultaneously for the growth and eradication of informal settlements, which was quite contradictory (Fernanda & di Villarosa, 2012). The thinking of the time labelled slum informal settlements as a problem which needed a physical removal as a solution. Due to this narrow solution, people that resided in the slum settlement were moved and settled into new housing units at the periphery of the city.

The term favelas have become a generic term of informal settlements in Brazil (Perlman, 2010). The government at the time saw that the informal settlements were causing danger to the millions of people residing in the city of Rio. The government then expressed its views against building temporary structures in the favelas as it hoped to have the informal settlement destroyed without offering any other alternative (Perlman, 2010). The favelas developed from the bottom hillside and the edges of the bay and as prime location filled up, these informal developments went further up onto the hilltop away from the water and the city core (Perlman, 2010). The growth of the favelas was also affecting the existing natural environment. A concrete wall was built to counter vertical and horizontal expansion of the favelas. People spoke negatively about the construction of the wall as there were speculations that the wall was built to hide the favelas out of view of the soccer world cup of 2014. The residents felt imprisoned and socially out of place in the greater urban fabric.

The favelas throughout history have been rejected by the government with destruction. These informal settlements have been seen as a threat to the privileged. The mass

migration of former slaves to Rio also contributed to the mass influx of people to the capital. This is in contrast to the notion of Rio being portrayed in a dream as a tropical Paris. The urban fabric is littered with informal settlements termed as favelas both within and the outer skirts of the city. The emergence of favelas was a result of the marginalisation and constraint access to urbanised land within an uneven social and economic structure ((Fernanda & di Villarosa, 2012). Many improvements have been made over the recent decades within the in situ settlements and policies to ensure suitable living conditions are improved.

Informal settlements should be approached from a social and economic dimension, which will connect the low, medium and high-density spectrum of society. Due to the rising pressures enforced by the residents of the slum dwellers, policies and service infrastructure were introduced. This was in the form of paved streets, basic sanitation and electricity. These developments on the outer skirts of the city were able to accommodate the migrating influx population.

The process of urbanization has been viewed as a theory, which has socially excluded and spatially segregated people. There have been a large number of people living in areas which are environmentally and socially dangerous. Intensive urbanization has caused people to illegally occupy land and thus the irregular formation of the loteamentos and favelas (Fernando, 2001).

According to Freitas (2009), places of high income and privilege have played a growing role in the creating and maintaining of inequality. There are large disparities and unevenness in cities, such as Brasilia, in Brazil and the trend seems to have also formed disparities between the natural environment and the built environment. Selective planning concerning planning with environmental restrictions has formed a widening gap in inequality. The low-income sector has been received with environmental inequalities in the form of an uneven distribution of amenities such as parks and specialized urban service infrastructure. The preparedness for natural disasters such as floods poses a risk on the low-income residential areas.

Third world countries have environmental inequalities where some communities do not have mitigation infrastructure to counter environmental hazards like mudslides and floods (Freitas, 2009). Areas in Sao Paulo have a concentration of low-income groups residing in riverbanks at the eastern portion of the city. These communities ended up being vulnerable to natural hazards and socio economic threats. The growing escalation of low-income settlements can also be attributed to the illegal subdivisions of the land, which makes it difficult to gain access to the urban infrastructure. Planning policies and structures within the city of Brasilia can also be attributing factor to the problem since some environmental areas are restricted and reserved for high-end development. Informal settlements in Brazil have been occurring in sensitive areas, in the peripheries of satellite towns, since 1980s (Freitas, 2009).

The socio economic inequalities can also be found in the Favelas settlement. The image associated with the Favelas makes it hard for people living outside these settlements neither to sympathize nor to help promote social and economic inclusion for the residents. The criminalizing image of the settlement diminishes the welfare, which then produces tough reactions towards the Favelas. This adds to the fact that the populations will deem the residents residing within the Favelas as second-class citizens. This also creates the notion that the residents within the Favelas do not deserve service infrastructure and should be banished from the city. This is one of the main reasons why the Favelas have been met with violence and a lack of social improvements for its people (Fernandes, 2014).

5.2.6 Kenya: The challenges of living in informal settlements

Informal settlements within Nairobi have a long history that dates back into the colonial period of 17th century. Most Africans residing close to the city were barred entrance to the city centre while the city council failed to address the presence of informal settlements in the city's 1948 master plan (Mutisya & Yarime, 2011). The growth of Nairobi's population is plagued with uneven distribution of social and economic opportunities. These lack of opportunities have led to mass poverty, unemployment, contagious diseases and other social and ecological disadvantages. Informal settlements are a result of the injustices of the past and current failures by current government institutions to eradicate the existence of informal settlements (Mutisya & Yarime,

2011). The lack of significant recognition of informal settlements makes it difficult for the government to fully include and improve the service delivery of service infrastructure within these communities. Kibera is one of the largest slums in Africa with a population of 900 000 people (Mutisya & Yarime, 2011). This was a settlement for Nubian soldiers returning from service. The colonial government allowed the settlement to grow resulting in this massive informal settlement.

The informal settlements of Kenya, particularly Nairobi lack basic services such as drainage, water and electricity. The inability to access energy and clean water results in the degradation of the natural existing environment. The high levels of unemployment also results in the escalation of crime and rising conflicts within and around the informal settlements. There are approximately 1.5 million people residing in informal settlements in Nairobi (Mutisya & Yarime, 2011). This is due to the government's failure to successfully implement multi-dimensional solutions, which will provide for the total eradication of housing problems within the area. Previous solutions included forced removals that led to serious conflicts with government institutions (Mutisya & Yarime, 2011).

While there is an escalating growth in the population of Kenya, more than 71% of its inhabitants live in informal settlements while another 34% of the population resides in the city centre (Mutisya & Yarime, 2011). Kenya has an annual informal settlement increase of 5%, which is one of the highest in the world (Mutisya & Yarime, 2011). Informal settlements remain problematic within Kenya because communities residing within informal settlements are not included with the rest of society nor are they empowered to make a significant contribution to society. The city of Nairobi is falling into an abyss due to the forever-escalating rise in informal settlements in the city.

In many African countries, particularly in Kenya, people have migrated to the city as a means to seek better opportunities. The city is known as a focal point of cultural, social, economic and political growth. These perspectives are the dominant reasons why people migrate from the rural areas into the city centre. The city is also viewed as a place that offers advanced economic and social functions that are generally deemed as superior. The urban population continues to grow substantially with more people living in slum

like conditions. The inhabitants display similar patterns with other African in migration and establishing temporary urban residence. The migration patterns to urban places are usually temporary, with a permanent establishment in the rural areas. The rural areas offer security of tenure and a sense of tranquil living. The constant link between the urban and rural areas is an economical survival strategy due to the rising urban poverty rate in Africa (Mberu, 2013).

These migratory movements coupled with population growth within the urban fabric challenges urban planning and environmental stewardship. There exists poverty within the settlement and a lack of basic services such as water, sanitation and access to adequate drainage. These conditions further lead to poor social and environmental conditions coupled with a high unemployment rate. Infectious diseases and contaminants are due to the inadequate conditions found in informal settlements. Close to 90% of the drinking water found in informal settlements is faecal contaminated and 26% of women living in informal settlement report a case of diarrhoea in a month period (Corburn & Karanja, 2014). The pathways leading to informal toilets in informal settlements are laced with pathogens that also contribute to diarrhoea and infections. Children are also found playing in the streets where faeces drain from the nearby toilets. There is no place to sanitise or wash hands after utilising a toilet. The lack of adequate sanitation facilities put human life at risk, especially that of children. Sustained and long-term exposure to pathogens limits cognitive development. This issue also leads to vitamin deficiency and malnutrition among children while causes the spread of water borne illnesses and urinary tract infections (Corburn & Karanja, 2014). Lack of sanitation also affects harshly on people living with HIV/AIDS as they are more vulnerable to intestinal parasites, which can be lethal to people with the disease (Corburn & Karanja, 2014).

These slum settlements were first incepted because of Africans being prohibited of being part of the urban fabric during the early century. The escalation of informal settlements is a common problem in Africa. This also due to Africa's colonial past. The existence of informal settlements is detrimental to the existing environment and provides no progressive human development and ecology.

5.2.7 Outcomes of informal settlements in relation to the environment

The city of Mumbai, formerly known as Bombay, has within its boundaries a population of an excess of 16 million people (McFarlane, 2008). The municipal corporation in Mumbai had exponentially increased the budget of provision of sanitation services due to the growth rate of population (McFarlane, 2008). The growth of the budget was driven by the concerns made by both the state and donors in retaliation to the escalating health concerns. It was noted that health concerns did not come from the middle class, but rather from state and civil society. This was due to the ability of the middle class society in isolating themselves from the challenges faced by informal settlement residents (McFarlane, 2008). The middle class societies would rather see the eradication of informal settlements as a more viable solution rather than one of incremental upgrades of services and development within informal settlements. They see informal settlement dwellers as encroachers and would rather see the 'encroached' land be given back to its rightful citizens (McFarlane, 2008). Vacant land should be transformed into plots of social housing, not just as an economic opportunity of building shopping malls and corporate entertainment centres.

Poor living conditions have forced women in Mumbai to utilise open spaces rather than congested unclean toilets (McFarlane, 2008). This makes them more vulnerable to harassment, but their preference is due to the negative health and security reasons which are connotative to public ablution facilities. Public ablution facilities are too far, too expensive and generally unclean. Most informal settlements lack properly constructed systems of eradicating excreta, sewage, sullage and solid waste. As a result, these areas become breeding grounds for diseases and environmental hazards (McFarlane, 2008). Most existing ablution facilities were in a horrid state, poorly maintained and were more prone to causing the spread of diseases. In Mumbai, one in three toilets provided by the government were not in proper working conditions (McFarlane, 2008).

Urban poverty is more preferable to migrants than rural poverty (Marx et al., 2013). The façade of being close to places of opportunity makes informal settlements a more permanent feature in the urban fabric. Slums continue to be perceived as more of a permanent phenomenon rather than a temporary feature because of failure of implementation of policies; co-ordination problems and socio economic poverty status

quo continue to be a trap for the majority of informal settlement settlers (Marx et al., 2013). Lack of access to clean water is also prevalent in countries such as Bangladesh, Kenya and Sierra Leone. In Sierra Leone routinely experience cholera outbreaks and other poor health outcomes. Children informal dwellings in Freetown have a significantly lower weight to age and weight for height as compared to children in rural areas (Marx et al., 2013). This outcome speaks volumes to the consequences of living in areas which are lacking in health, security of tenure, socio economic and environmental sustainability. According to Marx et al. (2013), in Kibera, 10 per cent of households have experience evictions and 4 per cent of households have experienced death every 6 months. In Bangladesh, 56 per cent of residents in informal settlements do not have access to sanitation, water, healthcare and good shelter. Accordingly, 48 per cent of residents do not have feel safe in their own community. In Hyderabad informal settlement, 70 per cent of resident classify themselves as being poor, with only 12 per cent of residents receiving government grants.

Three main aspects to consider during the implementation of natural disaster mitigation parameters are land-use planning and policies; shelter design, building materials and construction methods; and institutional organization at local, provincial, national and international levels (El-Masri & Tipple, 2002). Urbanisation and poverty has pushed people, particularly those that live in underdeveloped countries, to live in dangerous and marginal conditions. People that reside in informal settlement do not only find themselves exposed to health hazards caused by the inadequate access of essential services, but also become the reason behind the deterioration of the surrounding natural environment. The pursuit of survival comes with the over exploitation of natural resources. The deterioration of natural resources also becomes the source of natural disasters which further has a negative effect on those residing in informal settlements (El-Masri & Tipple, 2002). People residing in informal settlements are caught in a vicious cycle of economic deprivation and poverty.

5.2.8 Collaborative Model

Edward & Jones (1976: 12) define community as “*a group of people who reside in a specific locality and who exercise some degree of local autonomy in organising their*

social life in such a way that they can form a locality base and satisfy the full range of their daily needs”.

The collaborative model has been made famous by Jürgen Habermas. The theory has been met by criticism in the past since it nullifies any role of power in its systems. Communicative planning came into prominence in the early 20th century (Habermas, 1984). The aim of the theory is to incorporate different people with different subjective ideas and mesh all these ideas together to construct an idea, which can accommodate all paradigms of thinking. The agenda of communicative planning helps in the process of people understanding each other where a range of ideas can be meshed into one. It will only work with the participation of all stakeholders involved as it plays a central role in this theory. The process seeks to provoke debate and negotiation within the communication phase of the project (Habermas, 1984).

The shift from the ideal communicative theory is when there is domination and a play of power. The power struggle may come from capitalists and other groups or institutions that want to propagate a certain one sided agenda. Collaborative planning is more technocratic and political, and it borders on the need to advocate peace-making. It challenges the oppressive normative planning policies, where a bottom up approach is facilitated and where the voices of the marginalized are heard (Habermas, 1984). Oppressive normative policies were policies that were implemented by the apartheid government to marginalize people of colour. It was considered normative at the time because it was regulated through legislation and considered by some to be normal and fair. Collaborative planning is very democratic in nature and it includes the interests of the marginalized through diverse discourse. Communication through talks and conversation will ensure that the diverse population is incorporated into the participation process encouraged by communicative planning, which is the goal of a diverse discourse. These voices should be able to influence the social, political and environmental courses of action that affect their influence in the project plans. Collaborative planning involves the insight of assembling strategies and defining quality plans of action that will facilitate the needs of a particular community (Habermas, 1984).

The main concepts of a communicative approach can be summarized into the following conditions; participants need to be encouraged to be engaging, list their desires in order to achieve what is being planned, there has to be an interactive approach where by strategies and tactics are discussed. Communicative rationality is more community based rather than individualistic. Post modernism also incorporates a society that is within itself different in many ways. Therefore, the purpose of communicative planning does not ensure that all issues put on the table are agreed upon (Yiftachel, 1998). It is therefore important that planning processes be communicated with people in order to formulate localized solution. Sound communication is also important as it makes the community aware of any changes that may be implemented during phases of the project. The response of local participants should feed to engage a localized solution pertaining to the planned project (White, 2015).

5.3 Literature review in the local context

5.3.1 Introduction: The challenge of informal settlements in South Africa

Apartheid planning and the formation of informal settlements cannot be conceptualised separately. The emergence of informal settlements was met harshly by the apartheid regime, which cultivated the force removals of people within these settlements. This also gave rise to policies that were a catalyst to an orderly increment of segregated urbanization. These policies aided in the demolishing of existing informal settlements and the erection of semi standard settlements. The control in the influx of Africans into the urban areas was further intensified by the developments of homelands. This mechanism controlled both the movement and influx of Africans in and out of the urban fabric. Another alternative was the formation of rental housing units; this development was seen in the black township of Manguang in Bloemfontein where 6000 units were built to improve the housing conditions of Africans living in close proximity to the white urban areas (South Africa, 2001).

Apartheid spatial planning was designed to geographically and economically exclude South Africa's poorest citizens, the resulting consequence of this phenomena is the present escalation of poorer people accessing land illegally or extra legally (Background Paper: Sustainable Human Settlements, 2014). The high cost of land situated in close

proximity to places of opportunity is inaccessible to the poor masses. This poses a challenge for the government as the implementation of interventions may only be possible at the peripheries of the city, away from opportunity. There is a disjuncture between existing policy legislation and the level of implementation due to existing unstable realities on the ground.

The use of apartheid urban policies also enforced the management and stewardship of land. This also controlled the influx of people of African descent invading land uncontrollably. This subjective control was again lost in the early 1990s as many people started invading vacant lands previously controlled by the apartheid government. The post-apartheid government came under scrutiny to try and control the massive influx of people coming into the urban areas (Marais, 2013). It became apparent that new and humane stewardship measures were needed to mitigate the rise in the migration of people into urban areas.

The South African government officials seldom understood the complex social networks that exist within the informal settlements. This made it difficult to develop in accordance to the needs of the people living within the settlements. Incorrect assumptions have been made concerning the needs, plots sizes and family sizes within the people that live in the informal settlements (Marais, 2013). Such approaches are criticized for not providing adequate space for future developments for people living in in-situ housing developments.

The principles of sustainable development requires the consideration of the following factors; the avoidance of disturbance or loss of all ecosystems and remedial action of all disturbed ecosystem, the destruction of all surrounding environments must be limited in order to sustain both the environment and development for the future (NEMA, 1998) The concept of sustainable development require the integration of the social, economic and environmental factors, which need preservation for the future generations (NEMA, 1998).

It was only in 1972 that environmental issues began to become an international issue with the participation of 113 countries in Stockholm (Elliot, 2006: 54). The development, industrialisation and environmental issues had to be discussed. A

relationship between the environment and development needed to be established so that there is sustainable way for both humankind and environment to survive. Two entities that are the environment and development must be compiled. It is also imperative to acknowledge that most conflicts are a result of confrontations due to environmental resources. This then brings poverty to those on the receiving end of these conflicts as natural resources are deprived from them (Elliot, 2006: 44).

Informal settlements in Cape Town are marred with health hazards, violence and numerous socio-economic challenges. Interventions such as imposed strategies to improve social, economic and health conditions have been proposed in the form of physical infrastructure for the informal settlement dwellers. The introduction of physical service infrastructure provides a significant and tangible improvement to the living conditions by reducing vulnerability and improving safety conditions (Reyes & Gubevu, 2015). The rapid rates of urbanisation coupled with malnutrition, impoverishment and social exclusion have resulted in the high crime rates and violence. Lack of service infrastructure propagates illegal installation and poor maintenance of the existing infrastructure. A poor living environment and lack of access to land results in increased land invasions and escalated poverty and inequality.

According to Statistics South Africa (2011), the housing backlogs of housing units are at approximately 1.9 million, with a delivery of more than 3.8 million houses since the inception of democracy in 1994. The challenge of housing delivery further propagates the escalation of informal settlements as most housing developments are developed at the periphery of city centre. These developments are further away from social and economic hubs, further prompting housing beneficiaries to leave their abodes to be closer to the city centre (Reyes & Gubevu, 2015). The current model of the one plot-one house is not financially and environmentally feasible, and is thus hugely inefficient (Reyes & Gubevu, 2015). These are all contributing factors that are a catalyst to the migration of people from the periphery to the informal settlements within the vicinity of the city centre. There needs to be a change in the perspective of informal settlements being viewed as dirty, infested and chaotic into an urban environment that contributes to the urban fabric.

5.3.2 Understanding the emergence of informal settlements

According to Harrison (1992), informal settlements have varying characteristics which can be classified into two categories. The urban foundation has recognized two categories of informal settlements namely, “spontaneous informal settlements” that fall outside the framework of conventional town planning and informal settlements that form within the context of official site sanctioned schemes. Spontaneous informal settlements include backyard informal dwellings and informal settlements that occur in areas that are not zone for housing. The escalating health epidemics caused authorities to view the escalating growth of informal settlements as a pressing issue. This rise in health hazards within informal settlements influenced the health acts that govern and coordinate development. Informal settlements over time have been influenced by the change in the pattern of politics. According to Harrison (1992), informal settlements have differed over time, dictated by political and health concerns.

Table 5.1 Legislation and policies that contributed to the emergence and growth of informal settlements in South Africa.

Stages of occurrence of informal settlements	
Pre-1923	Early urbanization and the Public Health Movement
1923-1939	The Native Urban Areas Act (influx control and racial segregation)
1939-1948	Rapid urbanization and the proliferation of informal settlements
1948-1967	Apartheid, mass housing and the destruction of informal settlements
1967 -1979	The housing freeze and the re-emergence of informal settlement
1979-1985	Self-help housing and the gradual acceptance of black urbanization
1986-1990	The policy of orderly urbanization
Post-1990	Democratization and urban reconstruction

Source: Harrison (1992)

Informal settlements are not a new phenomenon; they have been an occurrence in Cape Town after the emancipation of ex slaves in 1834. Johannesburg and Kimberley had shanty towns that were eventually formalized while the city of Johannesburg had an influx of congested backyard informal dwellings and varying pockets of informal settlements. The Native Urban Area Act which was prevalent in 1923 to 1939 was formulated with the goals of restricting the influx of black movement into the urban areas and to set aside land for formalized housing called the locations (Harrison, 1992).

The black race movement was restricted and only permitted into the urban fabric only if it benefitted the white race. After 1939, the rise in industrialization after the Second World War fuelled a mass migration of blacks from the rural areas to the urban areas (Harrison, 1992). The number of black people in Johannesburg increased by a 100 per cent during this period. Land invasions were also prevalent in this time as housing constructions were at a standstill after the war. Land invasions both in neighbouring farms in Cato Manor and vacant land in Johannesburg were rife in 1948 where authorities tried unsuccessfully to eradicate these informal settlements.

The Group Areas Act of 1950 and The Prevention of Illegal Squatting Act of 1951 were instrumental in ensuring that the control of influx of the migration is controlled and reduced (Harrison, 1992). This gave rise to the ethnic spatial engineering regulations and policies Squatter camps in Cato Manor, District six, Sophia town and others had dwellers forcefully removed. This gave birth to Major Township developments such as uMlazi, KwaMashu, Guglethu, Soweto and Nyanga in 1967, the government decided to freeze the construction of township developments. This decision came at a time where there was a rise in rural urban migration of black people into the urban fabric (Harrison, 1992). The consequence of the government freeze in township development was the rebirth of the informal settlement in the periphery of the urban fabric. Cape Town had a unique situation over and above the restriction of black migrants and that was the existence of coloured residents in informal settlements who were migrants deemed as illegal occupants from Ciskei. The period of 1979 to 1985 saw the beginning of societal acceptance to black urbanization (Harrison, 1992). The government saw the realization that the policies and regulations were dysfunctional which led to government abandoning its official policies and building standards that discouraged lower quality housing. State funds were not enough to secure adequate housing for all and it was with this mentality that it was inevitable that informal settlements were to be accepted.

5.3.3 A case study of Freedom Park

According to Reyes & Gubevu (2015), Freedom Park is located in Mitchell's Plain, the poorest and the second biggest township in Cape Town. The informal settlement experiences the highest levels of crime and rape. Freedom Park was established in 1998 when a group of backyard settlers occupied a vacant plot of land previously zoned for a

school. Like all informal settlements, Freedom Park lacked, until 2001, basic service infrastructure such as electricity, water and sanitation. The lack of food security and opportunity inducing economic activities within further fuelled the rate of gang shootings and drug wars. The lack of electrical infrastructure meant that the general safety of the community at night was significantly compromised. The lack of basic street lighting increases the rate of theft, muggings, molestation and rape within the area.

The upgrading process of the Freedom Park Settlement incorporated a bottom-up approach where the community approved the designs and layout of the proposed upgrade settlement (Luthango et al., 2015). The community was moved into the peripheral boundary of the informal settlement so that service infrastructure could be installed. Safety and security concerns were of paramount importance to the community and were listed as top priority of the aspects to be considered during the design and implementation stages.

The construction of the housing development implemented by the Cape Town government commenced in 2007 and reached its completion in 2009, with a total of 493 houses built in Freedom Park (Luthango et al., 2015). The community had a mixed reaction to the implemented upgrades, citing that the upgrades brought improvements to the liveability and their dignity. The community now has bricked walls, electricity, water and sanitation services. The only disadvantage brought forth by the upgrades is the costs that come with the service infrastructure. The community is mostly unemployed and has no means to maintain the costs accumulated by the existing infrastructure. Some community members felt that the developmental upgrades within the informal settlement have caused them to fall into more debt and poverty. The upgrades had also caused a collapse in the cohesion of the community. The layout design of the settlement system of the one plot-one house design promoted a sense of individualism which further intensified the social fragmentation of the community. The upgrades did not provide any improvement to the general safety within the community as the rate of crime and gangsterism had not decreased. The increased stress due to unemployment is a contributing factor to the increase in rape, domestic violence and crime which is prevalent in Freedom Park.

Informal settlements are situated in environmentally hazardous conditions, usually near river banks, flood plains and areas deemed as wetlands. The illegal status of informal settlement poses a challenge for sponsorship and government intervention to invest in improving the living conditions and health hazards associated with living in informal settlements (Mears, 2011). Residents who live in informal settlements have a higher risk and mortality rate due to the hazardous living environment. Access to amenities such as clinics, schools and other social facilities is limited due to government policies which preclude the construction of social facilities of un-proclaimed land (CS Consulting & Afesis-corporation, 2014)

5.3.4 Relationship between informal settlements and natural environment

It is anticipated that the current one sixth of the world's population that resides in informal settlement will double in the year 2030 (Beardsley & Werthmann, 2008). Informal settlement upgrades are mostly provisional and experimental. Society is yet to find a definitive solution to incremental growth of informal settlements. Significant improvements in low income communities can be achieved through a combination of localised solution based initiatives both on a small and large scale to aid in the upgrading of transport nodes, essential services and economic infrastructure (Beardsley & Werthmann, 2008). Informal settlements are viewed by public perception as unplanned and spontaneous, a perception which is deemed as misleading. Many informal settlements are planned but not in the perceived interpretation and understanding of conventional planning (Njira & Moronge, 2013).

The comparison of formal and informal settlements residents is starkly different in the dimensions of existence. Residents dwelling in formal settlements are less likely to complain about mental health issues than informal settlement residents as they have a stronger sense of the belonging and have a deeper level of satisfaction with their surrounding environment (Shortt & Hammett, 2013). Informal settlement dwellers suffer from ill-health due to overcrowding, lack of sanitation, densely populated infrastructure. These contribute to a continuing burden to an enhanced vulnerability of diseases and further disparities of socio economic inequalities. According to the World Health Organisation, the contributing factors to the tranquillities of the well-being and

health of a household are namely, the house, the home, the neighbourhood and the community (Shortt & Hammett, 2013).

These dimensions impact the well-being and health of the household. These factors are used to create a holistic structure to the improvement and upgrade of informal settlement. Densely populated informal structures create an environment which is limited to movability and high mortality rate of biohazardous particles. Residents of informal settlements are three times more likely to report an illness and injury than residents living in formal settlements (Shortt & Hammett, 2013).

Informal settlement dwellers report are three times more likely to view their home as a negative space where the home contributes significantly on family health systems. Social stigma that emanates from the perception of society regarding informal settlements also impacts of the psychological state of informal settlement dwellers. The pollution of water sources causes an outbreak of waterborne disease and disease carrying insects such as mosquitos. The rapid growth of informal settlements along river banks and flood plain increases the chances of soil erosions and landslides (Ali & Sulaiman, 2006).

The traditional hazards that threaten the existence of informal settlements stems from the location of the settlements. Threats have varying levels of significant physical socioeconomic and psychological damage to people living in poverty stricken circumstances. Global statistics show a significantly higher mortality rate of people residing in informal settlements than formal settlements during natural disasters. Associated environmental hazards which are connotative to the existence of informal settlements come in the form of contraventions such as health, safety and security. Informal housing is built with materials such as timber, corrugated steel and iron which carry health problems associated with thermal inefficiency and poor ventilation rates. Lack of essential services is also a major cause of diseases such as diarrhoea, respiratory infections, malaria and perinatal complications (Napier, 2000). The use of biomass fuels, bulk storage of building material and informal electrical services make informal settlements more prone to outbreaks of fire (Napier, 2000).

Higher levels of density within informal settlements lead to higher rate of assault and abuse. The residents are also more vulnerable to crime as a lack of access to insurance, finance and police services is more prominent. Vacant unmanicured fields pose an opportunity for violent crime. Vehicle access, lack of street lighting, lack of house addresses also attribute to a lot of crime not being reported or investigated within informal settlements (Napier, 2000). This results in the formations of more localised forms of crime prevention, which have a negative effect on low income households.

According to Pimentel (2007), the World Health Organisation reported that the increasing population growth influences the growing number of human diseases worldwide. It is estimated that 40 per cent of the world's diseases can be attributed to the degradation of the natural environment. The diverse infectious micro-organisms coupled with the increase degradation of the natural environment makes the control of increasing disease extremely complex. Infectious diseases such as acute respiratory infections, human immunodeficiency virus/autoimmune deficiency syndrome (HIV/AIDS), diarrhoea, tuberculosis, malaria, and measles contribute to 90 per cent of the world's deaths. Organic and chemical pollutants which are attributed to environmental degradation accounts to 62 million deaths per year and 2 million children die every year due to diarrhoea caused by the usage of contaminated water and food.

Furthermore, densely populated environments without adequate sanitation promote disease epidemics such as measles and influenza. Developing countries pump 95 per cent of their sewage waste into surface water. The deviation of natural water flow influences a change in biodiversity which then leads to an explosion of diseases. Water related diseases such as malaria are also prevalent in developing countries, with over 50 per cent of the world's population being exposed to malaria. Over 500 million people are infected by malaria, resulting in approximately 1.2 million deaths. Urbanisation seems to reduce the number of malaria infections due to the lack of breeding sites in urban areas. Young malnourished children are twice as likely to acquire malaria. Global warming, deforestation, water pollution and changes in land uses offer an opportunity for mosquitos to breed and manifest. Land and soil degradation also harbours pathogens and chemical pollutants which may become airborne, entering the eyes, noses and mouth. This phenomenon can cause respiratory diseases such as bronchitis and asthma.

Pathogen species have been recorded in the blowing wind, there has been 19 pathogens including anthrax found in blowing soil. Erosion of soil can transport toxic chemicals, heavy metal and pesticides which lead to contaminated food and water sources. Helminth species are also found in soil samples contaminated with human faeces. This specie also ends up in water and food sources. Overcrowded environments can act as a catalyst to the spread of helminth species.

5.4 Legislative framework on informal settlement and the environment

5.4.1 Constitution of the republic of South Africa

The Constitution of South Africa, Act 108 of 1996 defines the fundamental rights such as dignity and freedom of movement that every citizen should benefit from. Section 24 states that “*every citizen has the right to an environment that is not harmful to their health or well-being*”. Correspondingly, section 25 of the constitution states that government “*must take reasonable legislative and other measures within its available resources, to foster conditions which enable citizens to gain access to land on an equitable basis*”. In addition, section 26 of the constitution states that “*every citizen of South Africa has the right to adequate housing facilities*.” Similarly, section 27 of the constitution emphasizes that “*all citizens have a right to access to health care, food, water and social security*”. Section 39 of the constitution stipulates that when interpreting the Bill of Rights, a court, tribunal or forum must promote the values that underlie an open and democratic society based on human dignity, equality and freedom. These are constitutional rights that ensure that every citizen has a secure environment that is conducive to a healthy productive mind, spirit, body and health. These four entities are pivotal in the making of a productive society.

5.4.2 Breaking New Ground Policy of 2004

The “Breaking New Ground: A Comprehensive Plan for the Development of Sustainable Human Settlements” was launched in September of 2004 as a strategy of redressing the colonial and apartheid spatial planning strategies. The strategy was going to be implemented through social, economic and spatially integrated house delivery. The Department of Human Settlements developed a housing project process guide for the Integrated Residential Development Programme; The Upgrading of Informal Settlement Programme and The Rural Subsidy: Communal Land Rights Programme to

further encourage community participation and the sustainable delivery of service infrastructure particularly in informal settlements. These programmes are also aimed to empower the people from a social, economic and participatory perspective (April, 2011). It was also implemented to emphasize an already established system of eradicating institutionalised systems inherited from the apartheid era (Musvoto & Mooya, 2016).

The purpose of the *Breaking New Ground Policy of 2004* is to align and plan around the principles of sustainable development (Breaking New Ground Policy, 2004). The population growth is expanding and there is a huge demand for housing. Proper policies are needed to ensure that proper procedures and structures are put in place to ensure maximum housing and service infrastructure delivery within the populous. The demand for housing has been on the increase for a long time. The growth in the number of people migrating into the urban fabric will increase due to the opportunity prospects offered by the city. Considerable growth is also happening in South Africa's secondary cities (Breaking New Ground Policy, 2004). These migrations influxes had caught authorities by surprise and the housing sector could not keep up with the demand of housing. The rise in informal settlements also contributed to the rising crime epidemic due to high rates of unemployment. The Breaking New Ground policy was implemented to ensure that all administrative, financial and institutional frameworks that were inherited post 1994 are properly managed to ensure a quality living for all (Breaking New Ground Policy, 2004).

The breaking new grounds policy was supported and embraced by social movements such as the 'Abahlali BaseMjondolo'. The KwaZulu-Natal Elimination and Prevention of Re-emergence of Slums Act was also legally challenged by the social movement in order to provoke government to recognise informal dwellings as a feature of the urban fabric. This also opens a greater opportunity of in situ housing to be developed in place of existing informal settlements. The perception created by the etymology of the word 'slums' needed to be replaced with the word 'informal' as this establishes a relationship between the informality that is found in informal settlements and formal in situ housing developments.

5.4.3 The national housing programme: Upgrading of informal settlements 2009

The government of South Africa has aligned its developmental innovation structures to the United Nations Millennium goals, which aim at providing significant improvements in the lives of residents living in settlements, deemed as informal (The National Housing Programme, 2009). The aim of the incremental upgrading of informal settlements is to ensure that the special needs of informal settlement residents are met. This is to conform to international norms which may affect 100 million informal settlement residents (The National Housing Programme, 2009). It is the municipality's responsibility to ensure that grants are provided to residents in a structured and cohesive manner. These services may include security of tenure, essential services such as water and sanitation and any other appropriate measures aimed at providing successful upgrading measures in informal settlements. The structures are institutionalized legislative policies instituted in terms of section 3(4) (g) of the Housing Act, 1997 (Act No.107 of 1997), ("The Housing Act") and is referred to as the National Housing Programme: Upgrading of Informal Settlements.

The policy is intended to ensure that security of tenure is preserved by recognizing civilian tenure rights of those residing in informal settlements (The National Housing Programme, 2009). Principles of Neo-Urbanism are also promoted through the promotion of healthy and secured living. This can be achieved by securing accessible spaces to install essential engineering services such as water, electricity and sanitation. Socio economic upgrades are achieved by applying localized solutions to the problems faced by informal settlement residents. This can also be achieved by facilitating community empowerment programmes through participative processes.

Informal settlements can be, according to the framework, identified by their illegality status as interpreted by the general public, their inappropriate locations which may be convenient for the dwellers, social stresses experienced by both the encroacher and the encroached and the poverty and vulnerability experienced by informal settlement dweller. The objective of upgrading projects is to reach as many informal settlements as possible (The National Housing Programme, 2009). Settlements which are deemed a health hazard and a security risk are identified as high priority. Upgrade programmes are aimed at providing social cohesion and spatial integration between various echelons

of class within communities; this can only be achieved through the upholding of community communicative participation principles.

Informal settlements are mostly located on land that is not feasible for development. The soil type and the natural habitat are also compromised by the encroachment of these informal settlements. Other informal settlements are situated in the periphery of the urban environment. This may sometimes cause tension on the security of tenure as locations may have not been zoned for urban development. The policy takes into consideration the special economic needs of the informal settlement residents and aims to upgrade the community by providing for social amenities such as sports fields and community centres (The National Housing Programme, 2009). The needs of the community can be determined through a consultative process with the community in need. Community participation process is aimed at achieving structured communication parameters between the municipality and the community members.

5.4.4 Social Housing Policy of 2003

The Social Housing Policy of 2003 was implemented as a way to regenerate the inner cities. It was designed to strategically manage the implementation of housing units to previously disadvantaged residents. It was also developed to facilitate the implementation of housing policy in conjunction with legislative, financial and institutional sectors. The policy further broadens the assistance programmes aimed at improving the living conditions of people in urban areas. The policy aims to restore human dignity by integrating development planning and involving private stakeholders in mitigating the damages of apartheid. Social housing does not accommodate the unemployment rate in South Africa. Renting property still needs occupants to have a formal or informal way of acquiring capital. For the purposes of integration, social housing cannot be limited to a certain income group (Social Housing Policy, 2003).

The significant increase in the demand for housing has been attributed to the urban population growth and urbanisation. Areas such as Gauteng have had a significant population growth due the social and economic opportunities the city offers (The Social Housing Policy, 2003). This increased the amount of informal settlements in and around areas of opportunity. The number of backyard informal dwellings has risen because of

the rise in unemployment. One of the challenges faced by the housing programme is the allocation of suitable land closer to places of opportunity. This forced the housing authority to further extend onto existing informal settlements. This strategy exceeds the budget of line function departments that deliver service infrastructure. The challenge imposed to the housing authority is to adjust to varying social paradigms so that resources are allocated sufficiently to residents. Housing units supplied to unemployed residents do not become assets as the maintenance costs alone become costly for occupying residents. The inability of people to maintain these residential homes then becomes a liability to the municipalities (Breaking New Ground Policy, 2004).

The inequalities have been ongoing for more than 20 years post-apartheid. The discontinued *Development Facilitations Act 67 of 1995* and various other recent approved applications such as the discontinued *Planning and Development Act No.6 of 2008* and the approved *Spatial Planning and Land Use Management Act No.16 of 2013* to ensure that the provisions of development are both fair and constitutional have made attempts. Segregated developments such as leapfrog developments have prevailed since 1994 and residential component is shaped by the level of financial stability found within the specific city (Musvoto & Mooya, 2016).

5.4.5 Advocacy Planning and Collaborative/Communicative Planning

Advocacy planning defines the active role the community advocate plays alongside those of the community (Davidoff, 1965). Unitary planning prevails when advocacy planning is non-existent. The advocate should be a proponent of substantive solutions, a simulator of solutions and a provider of information. The advocate must speak on behalf of his client's views and take account of all arguments in other plans. The analysis of alternate plans is more apparent, and the social costs and benefits are more explicit. The subjective and bias nature of other plans can also be pointed out during discussions and public participation forums. The agenda of an advocacy planning theory is to educate and research. The responsibility of changing mindsets and frames of thought orientation can be achieved by actively engaging with opposing agencies. Advocacy and plural planning directly and indirectly influence community upliftment and development. This comes in the form of working alongside community action organizations and student

organizations aimed at developing a self-valuation formula aimed at curbing poverty (Davidoff, 1965).

The culture of protest has been used to protest for service delivery and the movement of Abahlali BaseMjondolo has been pivotal in achieving victories in areas where informal settlements exist, particularly within Cato Manor (Mottiar, 2013). Through the courts, the advocacy group was able to persuade the courts to strike down the KwaZulu-Natal Slums Act that allowed municipalities to evict occupants who have illegally occupied land. The post-apartheid government recognized the act of protesting as a civil right rather than an opportunity. This enables citizens to have engagements with regards to policymaking and decision making. The ABM has been an advocate for the people living in slums settlements, though their influential powers have diminished over the years. The organization has brought about positive change in the process of engagement between informal settlement residents and the government (Mottiar, 2013).

Public participation enhances the effectiveness of a project by improving the quality of communication with relevant stakeholders and the decisions implemented. Participation relies heavily on citizen groups and government organizations to enhance compliance and implementation. It is also reliant on the inclusion of key influence stakeholders for relevant input. The inputs generated from meetings with stakeholders should enhance the quality of projects.

5.4.6 Public Participation and Local Environmental Planning

This can be seen in the protection of the environment through the upholding NEMA affiliated legislation and regulation. The *National Environment Management Act of 1998* closely administers the preservation of the environment. The act aims to formulate a solution-based approach that seeks to find a solution that will be the most benefit to both the community and existing environment. The act promotes engagement and the promotion of development that is equally socially acceptable and economically sustainable. The conservation of the environment also speaks to the requirement of acceptable living conditions for all. The National Environment Management Act of 1998 promotes the preservation of natural resources and promote security of ecological sustainable development (NEMA, 1998). The act also promotes the facilitation of public

engagements that promotes public participation in environmental governance. People should also be educated on an environmental perspective to provide for a sustainable environmental stewardship approach.

Environmental participation is usually done at local or regional levels. It is important that the environmental standards be not lowered to accommodate privileged groups within the stakeholders involved. According NEMA, the environment is entrusted to the people as a resource that should provide for the people and provide people's heritage (NEMA, 1998: 16). The Public participation process can provide what is known as lay knowledge, information that is not readily available to aid the implementation of a project. This can create creative and innovative solutions that are aimed at addressing problems experienced during the project. This will also promote the integration of different and unique suggestions and ideas. These ideas can also complicate the decision making process as they may compromise of certain policies and regulations enforced (Drazkiewicz et al., 2015).

Locally based solutions ensure that local interests are incorporated into the implementation phases. This will again allow outputs to be implemented at local contexts. Involving a large number of participants can also halt progressive solutions but leaving out certain local individuals can cause a minimization of localized solutions. Too much openness can hinder the progress of solution implementation. If participants agree on a consensus, then the decisions made can be legitimate, more respected and appreciated. It will be easier to implement and sustain agreed upon policies (Drazkiewicz et al., 2015).

5.4.7 Abahlali BaseMjondolo/Shack Dwellers

The Abahlali BaseMjondolo was an organization, which mobilized tens of thousands of people residing in informal settlements to oppose the systematic oppression, which was initially propagated by the apartheid government. The organization was able to democratize the community within the informal settlement. It also created an innovative culture, which challenged the government to priorities and recognize the struggles of informal settlement residents as legitimate. The movement challenged the status quo to the paradox of having a settlement that worked for the same system that seeks to do

nothing for them. It took on the notion of the scenario of working for white officials while defying them at night. The urban fabric has a vibrant array of land uses, which caters to crèches, churches and shops. The informal settlement has no viable life and sustainable living. The lack of sanitation causes a serious health risk to the residents. Toilets are at a distance from their abodes making them unsafe to be utilized at night. The lack of electricity within the informal settlements contributes to dangerous shack fires. The lack of sanitation also contributes to sickness and children have been seen eating the worms that curl around faeces near toilets. Ambulances and regular service vehicles hesitate to provide services within the informal settlements out of fear of being victimized. The criminalization of people who live in residence makes it difficult for them to receive fair and just treatment, particularly by hospitals and service providers (Pithouse, 2005).

The autocratic nature of how Kennedy road was run was being challenged. The area had been previously been run by izinduna who profited by levied taxes. The attempt to democratize the struggle was achieved in 2001, which then formed into a formidable movement in the years to come. There were clashes with the law, where the people from the informal settlement attempted to close roads and have marches for awareness. The people were tired of walking past faeces infested areas and being stooges for profit hungry developers (Pithouse, 2005). The spread of diseases is prevalent within informal settlements. The scarcity of sanitary facilities is an opportunity for breeding of diseases. The rain season causes the rise in mosquitos and flies. The night sky also calls nocturnal animals to run rampant. The night is usually a time when people get a rest from the day's activities. This is not the case for shack dwellers, as large rat's scourer for food in the informal settlements at night.

The formation of Abahlali BaseMjondolo also showed that a community that is neglected can form a strong voice of togetherness. It is built for the people and by a people, with a lived experience. These advocate groups are made up of people who speak and understand the same language. The common rhetoric is that if shack dwellers do not belong to this country, they must be sent back to where they belong or else be incorporated into benefitting in the fruits bared by this society (Zikode, 2008). The stewardship of grievances propagated by the lack of service infrastructure remains a

challenge for both informal settlement residence and relevant stakeholders. Mechanisms such as the formation of advocacy groups within the informal settlement environment aim to improve communicative structures between government and stakeholders (Mdlalose, 2014).

Participation forms an intricate part of the planning process and it important that the opinions and grievances of the people are tabled so that planning becomes a bottom-up approach rather than a top-down approach (White, 2015: 1). It is important that community participation be encouraged rather than the implementation of community consultation.

There needs to be a platform to address the inequalities formed against the impoverished. There is a need to have intelligent planning where the social and political aspects are examined so that equal opportunities are shared amongst the people. There is an imbalance between the distributions of resources within the society we live in. Resources such as wealth distribution and social commodities cannot only be solved by technical solutions, but by also changing social attitudes. An advocate for the people is needed to address all economic and social inequalities experienced by the residents (Davidoff, 1965).

5.4.8 Roles of an advocate of the people

An advocate should serve the public's interest by understanding the needs of a diverse community and working hand in hand with democratic policies. The advocacy planning theory encourages engagement with the community and should act as an advisory on agendas of sustainable development. The community should be engaged through participation. A bottom up approach is required to ensure that relevant and localized solutions are implemented at the top that will speak to the people on the ground.

The advocacy theory seeks to encourage participation through hearings, notices and cross-examinations. The theory aims at seeking the relevant truth in a language that can be better understood by the client. Involving the community ensures that the citizens are included in the planning proposals and internal processes of the project. These planning processes encourage a democratic urban government (Davidoff, 1965).

A unitary plan does not encourage participation from various stakeholders within the community. A plural plan should be administered so that all parties voice their opinions and all alternatives are examined. A disadvantage of the theory is that the solution devised will not satisfy all parties involved. Isolated plans will however provide incomplete and shallow analysis of potential alternatives. Advocating alternate plans would benefit and stimulate city planning in a number of ways. In plural planning, the public agency should be presented by interest groups differing with public agency plans. The proposal of alternative plans will further improve the quality of work and the rate of production of plans (Davidoff, 1965).

The early projects aimed at eradicating informal settlements were met with a lack of a communicative planning approach. The approach of the developments was technocratic and market oriented in approach. This gave rise to a one-size fit all design aimed at alleviating the shanty dwelling conundrum. The apartheid government had a spatial structure that was aimed at achieving a psychologically, mental and physical disenfranchisement of African people. The implemented mechanisms of eradicating this fragmentation were delinquent and poor. There were many unconstitutional policies that crossed over with the transition of the new government (Huchzermeyer, 2006). The restrictive informal settlement policies were not reviewed and incorporated into the housing policy. The informal settlement-upgrading program, which was a restrictive policy, was incorporated into the housing policy. This shift in paradigm influenced the agenda of the policy that was aimed at providing social inclusion for the previously disadvantaged. The agenda also included the providing for interim services such as water and electricity and the social participatory inclusion into layout planning (Huchzermeyer, 2006).

Participatory planning is a way in which communities are organized to common view projects and procedures. This is hardly achieved as local control is seldom achieved. The community needs to be understood in order to achieve increased efficiency, better use of resources and a larger degree of affordability. A community-based development could be a better way of ensuring that the community is encouraged to participate rather than be consulted. The community-based settlement upgrading has become common practice in Brazil. The Freedom Square upgrading process comprised of a community

trust that had community-based constituencies. The aim of this approach was to facilitate the acquiring of various rights through the trust. These rights including parcel ownership, essential services and refurbishment of existing infrastructure. The approach will empower both the current and future residents of the area, which will in turn promote the wellbeing of all community members.

5.5 Conclusion

This chapter reviewed the relationship between the environmental legislation, advocacy planning and communicative planning in relation to providing sustainable solutions for the community of Cato Crest. The role of the advocacy groups in the greater Cato Manor played a pivotal role in assisting the municipality through creating awareness for the needs of the residents through a bottom-up approach. The chapter also emphasized the importance of sustainable development in preserving the environmental status of the study area and improving the socio-economic status quo. Policies introduced structures which aligned and mitigated the population growth, demand of human settlements and the preservation of the natural environment. This chapter has highlighted that natural environmental problems and poor service delivery can be solved by having good communicative and advocative structures and policies that will be catalyst to producing positive results for the communities affected both on a local and international context.

The environment is seen as humankind's life support system. South Africa also adopted the three international pillars of sustainable development in the form of "*a collective responsibility to advance and strengthen the interdependent and mutually reinforcing. Pillars of sustainable development—economic development, social development and environmental protection—at local, national, regional and global levels*" (Kate et al., 2006). These principles are enforced to sustain both the socio-economic and natural environment for future generations to enjoy.

Development must therefore be managed on an equally short, medium and long-term approach. There have been various definitions of what sustainable development is. These various definitions cater to the various contexts that exist in different environments. These definitions form a basis of implementing sustainable development in its various contexts. Developments in the past did not see the need to link the environment with humankind. The environment was seen as a separate entity that could

replenish and rehabilitate itself. People viewed the environment as an entity that needed to be controlled and taken over. Over time, there needed to be a coherent relationship between the environment and human beings in order to provide for a sustainable living for future generations. The view that the advancement of science and technology will prevail over the need to preserve nature proved to be a fallacy. The environment is made up of intricate attachments and connections and thus can be viewed as an important factor to human survival.

Chapter six: Research findings, data analysis and interpretation

6.1 Introduction

The chapter systemizes the information acquired from the interviews conducted on the residents of Cato Crest, the councilor and municipal officials from the department of Human Settlements, Customer Service and Eskom's Land Development and Environment department. Respondents were interviewed to extract information that will help answer the research questions and fulfill the objectives of this research. Thematic analysis was conducted to analyze data collected in the field and recommendations were extrapolated from the findings made. This chapter seeks to find critical reasons as to why there is a continuous degradation of the existing sensitive natural environment in Cato Crest and to trace the current status quo of the service delivery in the Cato Crest informal settlement. The interview process also seeks to reveal whether or not the residents of Cato Crest have an established symbiotic relationship with the existing surrounding natural environment.

6.2 Data analysis and interpretation

Interview Analysis (Residents of Cato Crest Informal Settlement)

All respondents interviewed were adults above 18 years of age. All respondents are unemployed and were interviewed within the vicinity of Cato Crest informal settlement. The respondents were willing to engage with the researcher and share their day to day challenges faced in the study area. The residents point to a lack of opportunity in the rural areas as a paramount reason of their migration into the informal settlement. They believe being closer to places of opportunity and entertainment will change their lives for the better. All respondents feel that the government has not done enough to address the challenges they face as informal settlement dwellers. Residents of Cato Crest informal settlement come from rural areas and from the surrounding portions of Cato Manor. Lack of opportunities in the rural areas, lack of fertile land and essential service forced residents to migrate to the city fabric. They have no interest in the layout of the informal settlements as that does not contribute to their economic condition.

6.3 Research findings

The researcher was able to interview 12 (40%) females and 18 (60%) male respondents within the informal settlement. Males were easier to find as compared to females, females spend most of their time either washing clothes or indoors, while men preferred to sit outside their abodes. The table below is not an accurate depiction of male to female ratio in the informal settlement of Cato Crest. Based on the influence of past societal norms, men are more likely to leave their homes to look for better opportunities while women stay home and tend to the rearing of children. According to respondents, Cato Crest is seen as a gateway to a better opportunity, especially when compared to opportunities offered in the rural fabric. This may be the reason why the researcher found more men than women to interview in the study area.

Table 6.1 Gender distribution of respondents in Cato Crest

Gender of Residents	Cato Crest Residents	Percentage
Male	18	60%
Female	12	40%
Total	30	100%

The table below depicts the age group of the majority of residents interviewed at Cato Crest informal settlement. The majority of respondents (70%) are between the ages of 18 to 30. This shows that it is mostly young people who migrate into informal settlements as a way of being closer to places of economic opportunity. The older generation might not be able to catch up with the demanding pace of looking for opportunity in the urban fabric that is why the table depicts a low number of respondents between the ages of 51 to 65 years. The settlement is mostly inhabited by younger generation as compared to the middle-aged citizens, perhaps it may be the younger generation that is looking to establish themselves within the settlement, while the older generation might have migrated back to the rural fabric or they may have been inducted into permanent settlements.

Table 6.2 Age comparison of respondents in Cato Crest

Age Range	Intervals	Percentage
Between 18 -30	21 respondents	70%
Between 31- 40 years	2 respondents	6.67%
Between 41- 50 years	2 respondents	6.67%
Between 51- 65 years	5 respondents	16.66%
Total	30 respondents	100%

The inhabitants within the informal settlement of Cato Crest are predominantly African from all areas of both South Africa and Africa. The interviewed respondents were all black Africans. This shows that the study area is still very much fragmented as a result of the past.

Table 6.3 Race comparison of respondents in Cato Crest

Race	Intervals	Percentage
Black	30	100%
Coloured	0	0%
Indian	0	0%
Whites	0	0%
Others	0	0%
Total	30	100%

The education level of people within the settlement is very limited. The majority of respondents did not have a matric qualification. This makes it difficult for them to acquire good jobs as education is a fundamental pre-requisite to gaining good employment.

Table 6.4 Qualification Levels of Respondents in Cato Crest

Qualification	Intervals	Percentage
No Qualification	21	70%
Matric	9	30%
Certificate	0	0%

Diploma	0	0%
Degree	0	0%
Masters	0	0%
Doctoral	0	0%
Total	30	100%

A total number of 20 (66.7%) of the respondents interviewed were unemployed at the time of the interview. The remaining 10 (33.3%) respondents were employed on either informal or casual basis. Erecting and maintaining informal abodes, erecting and connecting illegal electricity supplies has become a source of business and income opportunity for those residents who possess the technical skills but short of acquiring decent employment. Another 10% of respondents work as cleaners and kitchen workers in nearby shops. Men usually wake up early in the morning and sit in various locations in and around Durban, waiting to be recruited by passing construction companies and people looking for handymen for that day. Remuneration for casual employment is between R110.00 to R150.00 for a full day's work. The remuneration is also dependant on the type of work done and the hours worked.

Table 6.5 Respondents Employment Status

Categories of employment	Intervals	Percentage
Construction Worker (Plumbing, Electrical, Building)	3	10.0%
Cleaner	1	3.3%
Mechanic	1	3.3%
Domestic/Kitchen work	2	6.7%
Factory Worker	3	10.0%
Unemployed	20	66.70%
Total	30	100%

The annual income of all respondents is below the R100 000.00 threshold. This make it very difficult to support themselves and their families financially as no steady income provides economic and financial security.

Table 6.6 Annual incomes of respondents in Cato Crest

Range	Intervals	Percentage
Less than 100 000	30	100%
100 000 – 300 000	0	0%
Above 300 000	0	0%
Total	30	100%

6.3.1 Refuse removal

According to the respondents, the continuous illegal dumping in Cato Crest is attributed to failure of the municipality in providing adequate refuse removal services. Residents who reside closer to the river find it easier to discard their waste into the river. The municipality has argued that it does not have the man power to collect refuse within the informal settlement and has in the past requested residents to leave their refuse bags along the pavement for collection. Lack of man power to collect refuse within the municipality speaks volumes to the disparities of unemployment and obscurities in government contract procurement processes. The municipality also sited safety and security concerns as a reason why it encourages residents to dump their refuse along the pavement for collection. According to residents, refuse bags at certain times of the month collect up in heaps along the side of the road, only to be ransacked by stray dogs and run over by passing motor vehicles. Most of the residents who live in the informal settlements during the day are females. Women who reside in the informal settlements find it difficult to climb the steep banks up to road to dispose of refuse. According to the residents, the municipality seldom comes to collect refuse, and it is for this reason that the residents do not care enough for the cleanliness of the area.

Figure 6.1 Refuse being disposed into river



Source: Researcher (2019)

6.3.2 Ablution Facilities

A number of self-made toilets exist within the Cato Crest informal settlement. The informal sewage facility spews human waste into the river. According to respondents, children also play in the polluted river, which contributes to the children's poor health in the informal settlement. Pathogens found in the river infected children with diarrhea and other waterborne diseases. The vicinity of the government provided ablution facilities are also very unsafe at night as they are found closer to the road. Women in the settlement would rather utilize the self-made toilets found closer to their informal abodes which further aids to the pollution of the river. Black people also have a deep superstition about the connotations attached to different households utilizing the same ablution facilities. Human waste, urine and other bodily excrements should not be encountered by another member of a different household. It is part of the African belief system that a stranger can utilize bodily excrements to spiritually harm certain households. Using the same ablution across different families' displays, according to the residents, a lack of understanding regarding matters deemed as private and sacred in the African cosmology systems. There is a belief by black people in general that urine and human waste can be used to bewitch and affect a particular family spiritually. This is one of the many reasons for the rise of homemade toilets within the informal settlement (The researcher, 2019).

Figure 6.2 Sewer waste washed into river



Source: Researcher (2019)

Figure 6.3 Informal settlements are built on the banks of the river



Source: Researcher (2019)

Ablutions facilities do not have proper drainage and water leaks in between the informal settlement. The residents have resorted to digging trenches and installing informal drainage pipes to redirect water from seeping into their informal abodes. The water seeping from the ablution facilities poses a serious health hazard to both residents and children who reside within the informal settlement. The ablution facilities do not have an adequate amount of toilet paper. Residents resort to the use of potato packets and newspaper as a substitute to toilet tissue paper. This results in the blockage of formal ablution pipes which then floods the facility and the surrounding vicinity.

Figure 6.4 Used water from ablution facilities overflowing into informal settlement



Source: Researcher (2019)

6.3.4 Electrical connections in Cato Crest

People connect electricity illegally to power stoves, lights and other electrical appliances. This creates a hazard to both adults and children as some conductors are strung on the ground without any standardized quality insulation and earthing. Residents turn to use illegally connected electricity, loosely coined as ‘izinyokanyoka’, as means to cook, keep warm during cold days and for basic illumination. The residents strictly refrain from using firewood as an alternative, as firewood poses a fire risk within the informal settlement. Their lack of use of firewood has minimal reasons to do with the preservation of the environment. The residents understand the dangers associated with the illegal connection of electricity but insist that it is their poverty connotative circumstances that force them to be perpetrators of illegal activity.

Figure 6.5 Illegal electricity connections in Cato Crest



Source: Researcher (2019)

6.3.5 Community garden

Gardening forms part of the efforts made by the residents of Cato Crest to uplift and create employment within the community. It goes without saying that these are the efforts made to bring forth positive change within the community. It keeps the residents busy while producing food for domestic consumption or for commercial wage which brings income into the community. Black women of previous generations were in the habit of getting together and plant crops that were eventually shared during the harvest. This garden is reminiscent to these dwindling habits practiced by previous generations.

Figure 6.6 Community vegetable garden found in Cato Manor



Source: Researcher (2019)

Figure 6.10 River water is used to water the crops



Source: Researcher (2019)

Lack of clean water is one of the main issues highlighted by respondents. The municipality should intervene in ensuring that this proactive and ongoing project continues to be sustainable and productive. The existence of the garden shows an innovative and proactive solution by community members in being game players in the economic playground. The growth of the vegetable garden is limited by the availability of land and by the continuous encroachment of informal settlements. The existence of the vegetable garden clearly shows that there are residents who are conscious to the preservation of the natural environment and aim to positively exploit it to bring positive economic contributions within the community. There must be a coherent mindset that is continuously built and maintained within Cato Crest residents that promotes the co-existence with the natural environment while proactively being active partners within the economic fabric. The garden is a perfect example of such dwindling, yet not so ancient, practices.

6.4 Research findings from municipal officials

The first municipal officer interviewed for this research is a Project Liaison Officer from the Department of Human Settlements. The primary role of this person is to facilitate community projects, manage stakeholder relations management and conduct

workshops on municipal initiatives to ward councilors, stakeholders, community members and developers. The officer also facilitates the construction of RDP houses and conducts the handing over of assets to the end user. The scope of work is communication based, and this scope is achieved through working with related divisions within human settlements such informal settlement management. According to this official, it is difficult to eradicate informal settlements in South Africa and the municipality has opted to use the option of managing the growth of informal settlement. The second official interviewed is a Professional Town Planner within the Department of Human Settlements. The primary role of the official is to manage the administration of the housing cycle which includes the feasibility studies specifically for land acquisition processes, pre-feasibility studies and conceptual housing typologies. The housing cycle is a continuous cycle that is monitored in line with other divisions to ensure that human settlements are adequately distributed into society.

The third official interviewed is a researcher within human settlements who has a primary role of ensuring that people acquire settlements that are dignified in areas where they can sustain themselves. The official has been directly involved in the restructuring and redesign of social housing units, hostels and the extension of social housing projects through the acquisition of land.

The fourth official interviewed is an environmental officer and advisor within Eskom's Land Development Department. This official ensures that all environmental regulation and legislations are administered during the erection, refurbishment and removal of electrical infrastructure. The officer works closely with contractors who specialize in botany, environmental law and environmental sciences to ensure that all flora and fauna are protected and sustained during various stages of development and infrastructure refurbishment.

As part of their job profiles, municipal officers seek to manage stakeholders, conduct workshops and communicate municipal initiatives and activities to the respective communities. The municipal officials also seek to provide for an urbanized environment that has all the amenities that constitute for a progressive and civilized living. They also seek to alleviate the residents of informal settlements from living in hazardous and hard

living conditions. The Department of Human Settlements seeks to provide housing with adequate normative concerns such as access, walkability, electricity, sanitation and water. Human settlement principles also cater for the planning and research into the studies dedicated to the improvement of service delivery. The municipality also administers pre-feasibility studies, land feasibility studies and conceptual housing typology constraints. Environmental studies are also done to mitigate and monitor disturbance of environments through the use of Environmental Impact Assessments and Basic assessments.

These officers have the necessary practical and theoretic experience to give informative answers which are most relevant to this study. These practitioners are well acquainted with the policies, expectations and challenges faced by both the municipality and residents of informal settlements that fall within the boundaries of the eThekweni Municipality.

The officials' interview basically sung the same tune when asked about the eradication of informal settlement and the rate of service delivery within Cato Crest informal settlement. According to the officials, the residents' mentality towards the development and redesign of informal settlements is the reason behind the stagnation of positive economic and developmental growth within Cato Crest and informal settlements all over South Africa. The officials stipulated that giving free housing and services to people contributed to the escalation of informal settlements. Residents who are given RDP house units end up moving back into informal settlements since maintaining RDP houses is beyond their financial bracket. The municipality does provide for the cleaning of ablution facilities, but all municipal officers fully maintained that there is still a lot of improvement in the service delivery of waste removal and maintenance of ablution facilities. According to both respondents and municipal officers, the municipality provides refuse bags to residents on a monthly basis. All officials agreed that a lot still needs to be done on illegal electrical connections. These connections pose a safety hazard to both adults and children residing in the settlement. Illegal connections are almost impossible to eradicate as there has been cases of violent confrontations between outage officials and residents of informal settlements.

The municipal officers believe that the municipality is on track with the delivery of important facilities and services but maintains that a lot can improve in accelerating the service delivery. The incremental service upgrades seek to provide for the provisions of water, electricity and sanitation. Service plans are implemented based on the findings on the ground. Proposed plans are overlapped onto existing maps depicting informal infrastructure on the ground. Wildfires and reblocking are some of the factors and provisions implemented during the design phase of the project.

The municipality is also aware of the scarcity of land. Land is a sort after commodity. Hence, vacant unused land that is in close proximity to centres of opportunity is very hard to acquire. According to the research official, the government has sorted the assistance of donations and lease agreements to find permanent and temporary accommodation for transit camps and RDP housing. People that are moved into temporal housing units and permanent RDP houses go through an induction to aid the facilitation of the movement of communities.

6.4.1 Environmental challenges in Cato Crest

According to residents, land invasions are still prevalent in Cato Crest; the researcher saw a land invasion of a vacant plot of land in Cato Crest while conducting interviews. Residents argued that land invasions were inevitable as spaces for building informal houses were diminishing. Residents also stated that vacant plots of land encouraged crime and drug use as these vacant plots are usually alienated. These land invasions have disturbed the natural existence of plants and animal species in the area. The residents feel that the municipal processes and policies are not prioritizing their needs, hence the community's urge to take decisions into their own hands. The community feels that invading vacant spaces is the only solution that will ease the congestion found in informal settlements and also curb mugging that is prevalent at night. Criminals are known for mugging residents and then hide in the bushes of vacant plots of land. The municipality has moved away from eradicating informal settlements as this is deemed as unconstitutional but has opted to manage and monitor the continuous growth of informal settlements. This has negatively impacted these vacant natural habitats within Cato Crest and surrounding areas and has made them vulnerable to dumping and encroachment.

According to municipal officers, the layout design of informal settlements has made it difficult to provide for adequate services such as water, sanitation, electricity and most importantly, refuse removal. Heavy rain also causes informal dwellings to be swept away as the foundations are not firmly entrenched on the ground. Heavy rain also causes rats which are a health hazards to both adults and in particular children. Informal settlements have been built on areas with unstable slopes and soils which are not conducive for a firm foundation of structures.

6.4.2 Disposal of waste in Cato Crest

According to all municipal officers interviewed, ablution facilities have been installed for both men and women with stand pipes, sinks and proper drainage facilities. The municipality has also employed the services of local residents to tend and clean these ablution facilities. The municipality ensures that supervision is administered to ensure that these facilities provide the service that they were intended for. The municipality is also mandated to collect waste every week and provide residents with refuse bags every month. According to municipal officers, the municipality has had budget constraints, which has a significant influence on the fluidity of service execution. The municipality relies on rates and rentals acquired from registered citizens; it then becomes a challenge to bill residents residing in informal settlements. According to the research municipal Official, the municipality only receives 10% of the financials requested from government. It becomes a challenge to properly render waste collection services in informal settlements.

6.4.3 Electrical connections in Cato Crest

The government has ceased to totally eradicate the constant growth and existence of illegal electrical connections. According to the municipal Officers, the municipality simply does not have the man power, security and resources to curb and eliminate the existence of illegal electrical connections. Illegal electrical connections are also a hazard and a challenge for the municipality. Disconnection is futile and dangerous as there have been cases of employees being injured during outages.

6.4.4 General challenges faced by the municipality

According to municipal officials, the municipality struggles with the general mentality of residents within informal settlements. Inductions are performed by the municipal official to ensure that residents are aware of the services rendered. It becomes a challenge when residents expect services such as electricity, refuse removal and water to be free of charge. The mentality that is prevalent amongst informal settlement residents, according to the municipality, is that electricity is supposed to be free. The disconnection of electricity is futile and dangerous, and in emergency situations, municipal personnel are escorted by armed security.

Refuse bags are given to residents, but waste is not disposed of in accordance to the standards imposed during the induction phase. All these setbacks are interpreted as a mindset problem by municipal Officers as the residents become immune and resilient to the problems faced within the informal settlement. The residents find innovative ways of conforming to the environment and living with the problem, rather than solving it. The municipality aims to create an enabling environment that through facilitation and co-ordination. This will provide an enhanced service delivery implementation plan which will improve the lives of the people.

According to the Eskom official, the problem is that policies and legislations are interpreted by the officers as policing documents rather than documents that should help preserve and inspire sustainability thought patterns within residents. The municipality cannot be blamed alone for the short comings of policy implementation. A stricter inclusion of multiple faculties of various echelons, such as the education sector, can greatly provide long term solutions to the issues of sustainable environmental preservation within informal settlements. The following generations should be educated with a revised curriculum that offers practical knowledge on how to preserve and exist in harmony with the natural environment.

6.5 Linking findings with literature

Through observation, black people operate on an 'inside out' approach in their indigenous planning, the peripheral is interpreted as a non-existent and far away entity (Researcher, 2019). This is further proven in the mannerism in the informal design of informal settlements; they are erected without any consideration of the status quo of surrounding land uses. The concept of urbanism can be seen practically with the emergence of informal settlements within the greater Cato Manor. The informal settlements found in Cato Crest were a result of a lack of opportunities found near the city centre. People who reside in Cato Crest come from all over the country to find better opportunities. The structures and cosmology of the area is reflective to the attitudes and challenges faced by the residents of Cato Crest. The municipality has tried to incorporate the effects of urbanism by in past trying to formulate ways to eradicate informal settlements. This method proved to be a failure, thus the implementation of management structures which aim to manage the challenges brought on by informal settlements.

From the interviewer's observations, informal settlements in Cato Crest are built within the parameters of an informal structure. Second hand corrugated steel and wooden poles are used as the main frame of an informal abode. These informal houses are small, damp, unlevelled and can occupy a family of 5 to 10 people. The informal settlement abode has all the amenities needed by the occupants to survive which include a make shift kitchen and sleeping quarters. The residents see their abodes as homes and place of solitude. An attachment to the place may be seen in the way the residents renovate and keep their place of residency clean in the inside. The municipality has in past given residents RDP houses, but these houses end up getting sold or rented with people going back to residing in informal settlements. Due to the lack of employment, they see this as an opportunity for economic advancement.

From the researcher's observations, Cato Crest and the greater Cato Manor is rich in historical connotation; residents who have grown and matured in the area have a sense of attachment and love for the area of Cato Crest. People within the informal settlement have shaped the character of the settlement and also gave meaning to their surroundings. The residents have created their own unique systems of advocacy approaches and crime

prevention through their attachment to the settlement. The continuous land invasion has been used as a means of expanding walking spaces and relieving wall to wall congestion.

According to all municipal Officers interviewed, the government and other state affiliated enterprises have been continuously attempting to improve the living conditions of informal settlement residents through enforcing the principles of sustainable development. According to the Research Official, the municipality, in particular, through incremental services upgrade programmes, has been able to implement positive change through reblocking, lease agreements and donations of land. Wild fires also gives the municipality an opportunity to redesign road networks within the settlement in order to make provisions for ambulance and police activity to penetrate the settlement should there be a need.

Brogenbrenner's theory of human ecology and development principles speak particularly to the effects the surrounding environment has in influence on the developing child, both in psychological and physical perspective (Härkönen, 2007). The recessive and entitlement mentality of informal settlement residents has been a stumbling block in the advancement of redesigning implementative measures within the settlement. According to the municipal Officers, initiatives such as induction workshops have not helped restructure and change the mentality of residents in how they perceive service delivery. Residents are caught in a continuous loop of having to survive to the unfortunate detriment of the surrounding natural environment.

6.6 Conclusions

There are contrasting stories which are being told by both the residents and employees of the municipality. The municipal and government affiliated officials blame a mentality of entitlement and an expectation from the residents that essential services should be provided free of charge. The counter argument given by the residents is that poverty is the driving factor of all illegal activities in the area. They cannot afford basic amenities such as water, sanitation and electricity because of their unemployment status. The government must be commended for eradicating unconstitutional policies that spoke to complete eradication of informal settlements. Informal settlements should be viewed as

a land use that is part of the urban fabric. The government should work with all spheres and echelons of society to ensure that the mentality of society changes into a society that can prosper developmentally while enforcing sustainable solutions for the future generations.

Chapter 7: Summary of findings, conclusion and recommendations

7.1 Introduction

This chapter summarizes the key findings in relation to the conceptual and theoretical frameworks of the study. It provides both a conclusion drawn from the study results and recommendations that can be implemented to reduce environmental degradation due to the encroachment of informal settlements. Recommendations on the prevention of informal settlement encroachment onto the natural environment on a short and long term basis have also been outlined.

7.2 Summary of the key findings

Cato Crest informal settlement is located in close proximity to the natural river and continues to encroach onto existing sensitive vegetation and forestry. The characteristics of Cato Crest informal settlement are not aesthetically appealing as continuous pollution of the nearby river and uncollected refuse causes a distinctive smell and grey water. This causes the living conditions of the settlement to be socially and economically regressive. The major causes of these phenomena are the illegality of the settlement, the lack of service delivery and the lack installation of adequate service infrastructure.

The research also found that the majority of respondents interviewed in Cato Crest are aged 18 to 30 years. This finding highlights the high number of young people who reside in informal settlements. The interpretation of this finding is that a large portion of the migrating populous is made up of predominately young people from various areas of the country whose primary focus is to search for economic opportunity. A large number of respondents are unemployed, which gives rise to illegal activities in and around the informal settlement. The lack of education among respondents may be a contributing factor to the rise in unemployment within the informal settlement. The unemployed residents often resort to innovative yet illegal opportunities for livelihoods. These opportunities manifest themselves in the form of illegal construction work, illegal electrical connections and illegal erection of informal latrine facilities.

The study population was predominately black Africans. This speaks to the disparities that are consequence of Apartheid planning. Black Africans who live in informal settlements are marginalized both socially and economically. The education level of the respondents is very limited, with a minority of respondents having only obtained a matric qualification.

The informal settlements of Cato Crest are built on the premise of illegibility and informality. The structure and layout of Cato Crest informal settlement does not conform to the design and layout standards of eThekweni Municipality. This makes it difficult for the municipality to provide adequate upgrades which may help in curbing the encroachment of informal settlements in environmentally sensitive areas in Cato Crest.

The research found that the continuous dumping is due to inadequate service of refuse removal by the municipality. There are also safety concerns within the municipality in penetrating the dense fabric of the informal settlement, which is one of the primary reasons for the reluctance of thoroughly cleaning refuse build up within the informal settlement. Residents also find it easier to dump refuse along the river banks; hence the banks are heavily polluted. The informal settlements are built on very steep slopes and it is for this reason that women find it difficult to carry plastic bags up the slopes to collection points along the road.

The inability of services, such as ambulance services and policing authorities, from being able to penetrate the nucleus of the informal settlement remains a challenge for both the municipality and residents. A poor waste management system also plays a critical role in the pollution of the natural environment in Cato Crest. The ablution facilities within the settlement are in a horrid state and are constantly spewing used soapy water down the slopes of the informal settlement. The polluted river and the informal makeshift drainage and latrine facility systems pose a serious health and safety hazard within the settlement. The pollution epidemic within the settlement is a catalyst to the transportation of pathogens and harmful molecules which cause sickness and diseases amongst adults and children. The residents have no compunction to co-exist with the existing environment. The urge to survive and actively participate within the

economical land scape far outweighs the environmental concerns propagated by the encroachment of informal settlements. The residents in Cato Crest do not have an adequate supply of toilet paper and resort to utilizing newspapers and potato sacks as substitutes. This results in the blockage and overflow of the drainage systems within the installed ablution facilities.

The study revealed that though there are houses with legal electrical connections; electrical connections in the Cato Crest informal settlements are predominantly illegal. The illegality of electrical infrastructure connections within the settlement is also prevalent. Illegal connections within the settlement pose a safety hazard to both adults and children. The municipality is reluctant to proactively respond to the illegal connections out of fear of having its Officers harassed by the residents. Illegal electrical connections are not earthed nor are they properly insulated or trenched, and this pose danger to all residents in Cato Crest. Officials mostly commented on the mentality of the residents within informal settlements as a primary reason for the stagnation of development of informal settlements. Residents who obtain RDP houses end up moving back into informal settlements as they see an economic opportunity in renting out RDP houses.

With regards to natural environmental impacts the encroachment of informal settlements in Cato Crest, the consequences are dire and seem far from being resolved. The informal abodes have encroached into the river banks and the existing flood plains in the area. The location of the informal settlement exists in very steep slopes which are financially unfeasible to upgrading development implementations. The existence of informal settlements in Cato Crest disrupts the natural expansion of biodiversity. The expansion of biodiversity is disrupted by the illegal dumping that occurs within the river and along the steep slopes of the river banks. Existing plant and animal species will not reproduce in abundance as the surrounding environment is not conducive to positive biodiversity growth.

7.3 Conclusions

The theme of this research was to highlight and evaluate the impacts of informal settlements to the natural sensitive environment. The research also aimed to highlight the root cause to the emergence of informal settlements and the ecological challenges and environmental effects experienced by Cato Crest residents due to the lack of essential service infrastructure development and delivery. The escalation of urbanization in the past decades has had its positive and negative effects within the informal settlement fabric. The research has also assessed the principles of urbanization and the effects thereof its concepts have on the relation between informal settlements and the existing sensitive natural environment.

The emergence and constant escalation of informal settlement is detrimental to the existing natural environment. The constant encroachment of informal abodes does not only fail at attempting to establish a symbiotic relationship with the existing natural environment, but also harms and disturbs the natural order of living biodiversity. The rise in populous within the settlement will cause a rise in the amount of refuse being dumped into the river. Human waste will also increase as informal latrines will be utilised on a more regular basis. The encroaching informal settlement also has become a catalyst to degradation of the existing vegetation in Cato Crest. The degradation of vegetation affects the lifecycle of living organisms which are the backbone of a thriving natural environment.

The ecological affects and consequences of the continued growth and encroachment of informal abodes within the Cato Crest informal settlement not only affect the natural environment but also the perspective of how residents view their surroundings within the settlement. The natural environment holds a minor or non-existent precedent over the instinct of human survival. The residents view the degradation of the natural environment as a necessary consequence in their attempt to survive on a social and economic perspective. The resident and the environment have no compunction to establish a symbiotic relationship, and the view of a concrete environment seems more of a practical establishment for the residents. The existence of the natural environment

is viewed as a disturbance by the residents as they attempt to alleviate themselves from economic and social poverty.

The emergence of informal settlement was an attempt by its residents to be closer to economic opportunities which were not necessarily found in the rural areas. The migration of the African populous, particularly in the post-Apartheid era caused a surge in the number of informal settlements in South Africa. The migration of people from the rural to urban fabric can also be attributed to the lack of investment of developments in the rural areas. Activity nodes should be connected and active to curb the desire for people to leave their homes and migrate to the city centre.

The lack of essential service contributes to the degradation of the natural environment. Not only does it degrade the natural environment, but it also undermines the health of the residents. The unsatisfactory service of waste removal contributes to uncollected waste being dumped along the road and within the river. Waste blocks the flow of water and causes water mixed with rubble to collect up in the river bed causing the infestation of insect and a build-up of viruses and bacteria epidemic.

The movement and migration of people from the rural to the urban fabric is the contributing factor to the expansion of informal settlements, which is also evident at Cato Crest informal settlement. Urbanisation is detrimental to the environment as it does not readily incorporate the inclusion of the migrating populous into the nucleus of the urban fabric. The swelling tide of the migrating populous contributes to the instability and social frictions which are prevalent in Cato Crest informal settlement.

The key actions to the eradication of informal settlements, emancipation of true environmental conservation and true socio economic freedom lie in the partnerships and collaborations to end poverty and marginalization, the empowerment of social change and justice and the fostering of mutual respect. This can also be achieved through the radical change of our educational institutions by bringing forth local and Asiatic scholars who will speak the history, the present and the future of African citizens. It is through the education of the residents that long term solutions can be formulated. The solutions to the preservation of the natural existing environment do not only lie in the delivery of services, nor in the delivery of human settlement establishments, but also in

changing the perceptive and mentality of society. This can be achieved in first addressing the existing subtle concepts that maintain concepts that encourage socio economic degradation, through the extension, amendment and maintenance of legislation that is aligned to the foundations of environmental conservation. The findings of the research conclude that the continuous existence and expansion of informal settlements contributes extensively to the degradation of the natural environment. The mentality of the residents does not create a symbiotic relationship with the existing environment hence the continuous degradation.

7.4 Recommendations

7.4.1 Recommendation for the municipality

The intensive delivery model of service infrastructure needs to be addressed so that maintenance and installation of the services can be monitored, preserved and improved. There must be a concise community involvement so that a bottom up approach is formulated in order for localised solutions to be implemented. The community must be informed and incorporated in all stages of development and implementation.

According to municipal Officers, the most innovative solution to curb the encroachment of informal settlement into environmentally sensitive areas is through incremental human settlement upgrade programmes. The recommendation made is that the municipality must focus on improving the existing management systems aimed at decreasing the incremental growth of informal settlements. Society must do away with the notion of numerating informal settlements and realize that there are human beings who reside in these abodes. Therefore, informal settlements must be viewed and accepted as part of the urban fabric.

Controlled encroachment onto environmentally sensitive areas is another recommendation made by the municipal Officers, controlled encroachment onto undevelopable and environmentally sensitive land will ensure that damage to the existing biodiversity is limited. As an aid of combating the escalation and constraints caused by the population within the informal settlement, the municipality has also

resorted to building in situ housing in 100 year flood plains. This creates a huge risk as communities will be in danger in an event of a flood.

According to the officer interviewed, the eThekweni Municipality has held various community participation engagements with the aim of bringing development and sensitizing people who reside in informal establishments into a global orientated way of thinking. Engagements, regarding the encroachment of land, inductions of new settlement occupants and service delivery initiatives have been made through the CMDA, the Abahlali BaseMjondolo and through protest action representatives. Ward committees also have a responsibility to ensure that there is a link between the community and the higher echelon of government to ensure a smoother transfer of queries and solution based initiatives. The recommendation made is that social stability will only be achieved through improved integration and cohesion between the community and the greater eThekweni Municipality. Social stability can be achieved through the intervention of programmes and initiatives that foster a more cohesive and self-reliant community. This can be achieved through the implementation of life skills and community outreach programmes aimed at capacitating the residents of Cato Crest informal settlement.

Recommendations made to change the dependency mentality of residents into a system of self-reliance will reconstruct social and economic norms within Cato Crest which will engineer a thinking pattern that is optimistic and positive amongst community members. This can be achieved through the administering of a social development structure for the area of Cato Crest and the greater Cato Manor. This may include included a defined line of strategic communication between social projects and the relevant departments within the municipality. This can be achieved through coherent and comprehensive non-profit organizations and government sectors will, which ensure a positive response from the local community. With limited resources, proper organizational skills amongst stakeholders will ensure that no duplication of work is done which may result in failure of upholding agreed upon mandates.

7.4.2 Recommendation on beneficiaries

Ward committee representatives are elected by the residents' advocates who are going to be the voice and fighting spirit of the community. Through public engagements and meetings, the community is given the opportunity to engage with the representatives about their respective positions. According to the respondents, the community did, however voice their dissatisfaction on the way they are being represented. The community feels that their voices are only heard when it is convenient or when municipal and governmental elections are close by. Community members also feel that they are not incorporated into the decision making meetings and as a consequence, the community starts taking decisions into their own hands. The recommendation made with regards to the point above is that a sincerer approach is needed to boost confidence relations between residents and the municipality. Stronger relations between the communities must be formulated in order for sound participative engagements to be achieved.

Recommendation for the improvements of the beneficiaries' socio economic status can be achieved through the structuring of small business enterprises by providing monetary funding, thus reducing unemployment. Job creation can be in the opportunity of small capital incentives in small clothes factories, food processing, crafts and carpentry. The improved structure of SMMEs will create job opportunities and investment in educational opportunities. The development of transport facilities will enable the smooth transition of employment and thus sustain expanding potential employment. The eradication of illiteracy will empower citizens to be productive members of society. The voluntary educational institutions which cater particularly for women will enable empowerment of residents within the community. The upgrading of educational institutions will enable the growth of social cohesion and promote an uplifted surrounding environment. The incorporation of the civilian society will enable the catering of market demands in the business sector. The incorporation of the government sector will reactivate positive upliftment in the community.

The research proposes short term possible solutions to mitigate the constant growth of informal settlements through the development of human settlements into vacant spaces by initiating service delivery, core housing schemes, the expansion of housing zone uses

and improved transport facilities. Securing land tenure rights for direct use of housing subsidy expansions should also be considered as a short term incentive. The encouragement for development of vacant land can be achieved by achieving sound agreements between the private and public sector. This can be achieved through policies and initiatives that facilitate land development, guided tax exemptions and land readjustment.

To curb the escalation of informal settlements, the housing allocation initiatives must be scrutinized and improved. Auditing procedures that scrutinize the allocations of housing schemes must be upgraded to curb the unfair allocation practices and nepotism within the housing allocation department. This will ensure that facilitation and transition inductions for the transfer of residents from informal settlements to in situ houses are satisfactorily administered. The socio economic conditions of applicants must be heavily scrutinized to seek eligibility of qualification. In depth studies with regards of the physical locations of informal settlements must be done in order to find opportunity of subdivision thus alleviating density and congestion. This will curb the migrating of people from their allocated RDP houses to further encroach into environmentally sensitive land.

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Appendix 1: Informed consent form

COLLEGE OF HUMANITIES
MASTERS/PHD RESEARCH PROPOSAL FORM
(HUMAN AND SOCIAL SCIENCES)

Date:

Dear Sir/Madam

My name is Zolani Khumalo, a student registered at the University of KwaZulu Natal, Howard College. I am Master of Town and Regional Planning student at the Built Environment Department under the Faculty of Humanities. You are humbly invited to participate in a short interview regarding the existing relationship of residents in informal settlements and the surrounding sensitive environment.

The following criteria will give you a brief synopsis on the objectives and aim of the study. This will help understand the context of what the study would like to achieve and answer the questions given from a more informed perspective.

The purpose of the study

You are being invited to participate in the study that involves the study of the informal settlements and their impacts on the natural environment within the area of uMkhumbane central. The research/study aims to examine the challenges posed by the escalation and encroachment of informal settlements within the area of uMkhumbane in relation to the existing sensitive environment. The research/study also aims to study the living conditions of the community residing in the uMkhumbane informal settlement and the challenges posed by their encroachment onto existing natural environment. The researcher hopes to interview a total of 35 participants, 5 of which are government employees/stakeholders and 30 being the residents of uMkhumbane central. The interview is scheduled to be 20 minutes long depending on the readiness and eagerness of the participant. The study is self-funded and hopes to shed light on the general atmosphere and opinions of both residents and stakeholders within the context of the aim of the research.

Procedures and Process of Interview

If you are a visitor/business representative/resident of the study area, you will be asked to fill out a questionnaire that will include your demographic information and other questions which are aimed at exploring your perception and lived experience of the area. You will also be asked to tick the box indicating whether or not you would like to be interviewed.

If you are Government representative/Government Employee or a Community representative, you will be asked to partake in an interview process aimed at understanding your perspective on the plights of the residents residing in the study area and how their existence affects both the ecological relationship amongst themselves and the existing surrounding environment. You will also be asked to tick the box indicating whether or not you would like to be interviewed.

The research is purely for research purposes and should you feel the interview or questions are invasive or uncomfortable, please feel free to stop the interview. Should you have any questions for the interviewer, please feel free to ask for clarity and context/perspective of the questions given. This will clear any forms of ambiguity and will ensure that the context/aim/objectives of the research are not lost. The research will provide no monetary benefits to the participants. By helping the researcher complete the study, the published work will be able to educate those that read it on the challenges faced by you the official or residents in rectifying and providing for an accelerated change to situation that require intervention within the study area. It will also help sensitize people who have little knowledge on challenges faced by people residing in the informal sector.

The participant will not be in any way held liable for the comments made in this research as the research is purely for academic purposes. This clause indemnifies the participant from any lawsuits and any legal action that may be taken from the comments made within this research.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee Approval Number:

In the event of any problems or concerns/questions you may contact the researcher at (provide contact details) or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

My details are as follows:

Name: Mr. Zolani Khumalo

Cell: 081 017 9205

Email: khumalzo@eskom.co.za

Supervisor's Details

Name: Mr. Vincent Myeni

Place of Work: University of KwaZulu Natal, Howard College

Email: myeniv@ukzn.ac.za

Tel: 031 260 2128

DECLARATION

I (Full names), have been informed about the study entitled 'The impact of informal settlements on environmentally sensitive areas. A case study of Cato Crest ,in Durban' by Zolani Khumalo.

I understand the purpose and procedures of the study

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at the following address;

Name: Zolani Khumalo
Cell: 081 017 9205
Email: khumalzo@eskom.co.za

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557 - Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview / focus group discussion YES / NO

Signature of Participant

Date

Signature of Witness

Date

Signature of Translator

Date

Appendix 2: Questionnaire and interview guide

Personal Details: Residents

Please specify your gender

Male	Female

Please specify your age

Between 18- 23 years	
Between 24- 30 years	
Between 31- 45 years	
Between 45- 65 years	
Above 65 years	

Please specify your race

Black	White	Indian	Coloured	Other

Highest Level of Education

Matric	Certificate	Diploma	Degree	Masters	Doctoral

Occupation

.....

Range of Income per annum (Please tick the relevant box)

Less than 100 000	
100 000 – 300 000	
Above 300 000	

Section B: Questions for Residents

1. How long have you been a resident in this area?
2. What makes the area of Cato Crest unique and special to you as a resident?
3. Are you aware that there are environmentally sensitive areas within Cato Crest?
4. Describe the environmental changes you have witnessed over the years you have spent residing in the area.
5. How is the social and economic liveability within the area of Cato Crest?
6. Are you able to easily manoeuvre to places of business in Cato Crest?
7. Is there water connection in this area?
8. Is there electricity connection in this area?
9. How does the shortage of electrical connections affect the natural environment in comparison to your emotional, physical and mental wellbeing?
10. How does the shortage of water connections affect the natural environment in comparison to your emotional, physical and mental wellbeing?
11. When were the water facilities installed and how have these facilities affected your way of life?
12. When were the electrical facilities connected and how have these facilities affected your way of life?
13. What other avenues do you use to facilitate the shortage of electricity?
14. What other avenues do you use to facilitate the shortage of water?
15. Do you have refuse removal services
16. How do you get rid of household waste?
17. What impacts does the polluted river have on your wellbeing and health?
18. How does the lack of services such as water, adequate sanitation and electricity impact on your physical health?
19. How concerned is the community about the cleanliness of the river?
20. Do you believe the existence of the uMkhumbane River has any significance to yourself and the community?
21. What measures would you recommend to the municipality as a way of accelerating service delivery?
22. As people, we are known to be guardians of the environment, how much do you know about the species of fauna, flora and animal footprint found in Cato Crest?

23. Are there any awareness campaigns aimed at educating the community about environmental conservation within the area of Cato Crest?
24. Do you have an active relationship with the municipality regarding the environmental wellbeing of the area of Cato Crest?
25. Do you get invited to any community gatherings regarding the environmental wellbeing of the area of Cato Crest?
26. How often do these gatherings happen within Cato Crest?

INTERVIEW: Municipal Official (Department of Human Settlements)

Occupation_____

Institution_____

1. Could you describe the nature of the work you do?
2. Do you think the municipality has achieved its mandate of providing adequate water for the people of Cato Crest?
3. Do you think the municipality has achieved its mandate of providing adequate sanitation for the people of Cato Crest?
4. Do you think the municipality has achieved its mandate of providing adequate electricity for the people of Cato Crest?
5. Do you think the municipality has achieved its mandate of providing adequate refuse removal for the people of Cato Crest?
6. What are the challenges that the municipality faces regarding the provision of electricity for the community?
7. What are the challenges that the municipality faces when providing water services for the community?
8. What are the challenges that the municipality faces when providing sewage/refuse removal services at Cato Crest?
9. Do you think the municipality has achieved its goal of transforming the area of Cato Crest into an urban setting that accommodates people of all walks of life and class within the area of Cato Crest?
10. Are there areas within Cato Crest that are classified as environmentally sensitive?

11. What is it the municipality doing to ensure that these environmentally sensitive areas are protected?
12. Are there any projects in past, present or future that aim to collaborate with the community and raise awareness with regards to the co-existence of the Cato Crest residents with the environmentally sensitive areas within Cato Crest?
13. What are the short term plans implemented to ensure that both the wellbeing of the people and environment are considered?
14. What are the long term plans implemented to ensure that both the wellbeing of the people and environment are considered?
15. What could, in your opinion, be ways of improving the wellbeing of the natural environment and people within the study area?

INTERVIEW: Ward Councillor

Occupation_____

Institution_____

1. Please briefly describe the role you play in the community of Cato Crest?
2. Are there any environmentally sensitive areas within the area of Cato Crest that you are aware of?
3. Is there an in depth awareness of the importance of protecting environmentally sensitive areas within the area of Cato Crest?
4. What is being done within the community of Cato Crest to eradicate the pollution of the uMkhumbane River?
5. How has the connection of water facilities in the area affected both the community and environment of Cato Crest?
6. How has the connection of electrical facilities in the area affected both the community and environment of Cato Crest?
7. What are the environmental implications of not having legal electrical connections have for the residents of Cato Crest?
8. What are the environmental implications of not having water connections have for the residents of Cato Crest?
9. Do you have refuse removal services? If no,
10. How does the community get rid of household waste?

11. Do you think the refuse removal services are efficient, how does their efficiency affect the natural environment of Cato Crest?
12. Are sanitation services provided within the area of Cato Crest?
13. How does the community of Cato Crest rid itself of sewage?
14. What processes are in place that help facilitate engagement process to the improvement of service delivery process between the public and government?
15. How in depth is the knowledge of environmental conservation enforced to the people residing in the study area?
16. Are there any stakeholders in the private sector who are involved in the improvement of the liveability of the residents of Cato Crest?
17. The developmental state of Cato Crest has over the years progressed significantly, in the context of the environmental state of uMkhumbane central; what would you like see changing for the better within uMkhumbane central?