A MANAGEMENT MODEL FOR HUMAN SETTLEMENTS

A case study of Nigeria and South Africa

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A MANAGEMENT MODEL FOR HUMAN SETTLEMENTS
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By

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Declaration

I, Adeleye Ayoade ADENIRAN 217788173, hereby declare that the treatise/ dissertation/ thesis for Students qualification to be awarded is my own work and that it has not previously been submitted for assessment or completion of any postgraduate qualification to another University or for another qualification.

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Abstract

Persistent depreciating human settlements is a global challenge, particularly in developing countries and this challenge contributes to the continuously increasing housing gap, despite several novel policies and programmes. Although there is a dearth of research-based literature on human settlements management, studies show that property management, Facility Management, housing management and urban management impact the sustainability of all these built environment milieus which form part of the human settlements' sub-components.

This research aimed at altering the afore-said challenge by exploring the management of human settlements in Nigeria and in South Africa. Philosophically, the research is pragmatic, and it rests on positivist deductive reasoning. The methods used for data collection include a review of literature, collection of archival records, and empirical studies of purposively selected professionals and stakeholders involved in human settlements' management in Nigeria and in South Africa. The findings indicate that existing human settlements in the case studies are "good" and "acceptable" with the majority adopting an outsourced method of management. Furthermore, the lack of maintenance records, the deficiency in policy monitoring and the training of management and maintenance personnel were the three highest ranking factors indicated to be affecting human settlements management. Moreover, an inhabitant's income, the time available for management, professional expertise and technology employed for management are recognised as the critical sustainability sub-factors affecting human settlement management. The factor analysis established ownership, human resource and capital, social, legal, technology, economic, physical and environmental factors as vital and very significant in achieving sustainable management of human settlements. The study recommends the professionalisation of the field of human settlements as well as a formulation of management policy among others.

The study developed a management model for human settlements, and it advocates that human settlements managers, owners and organisations should apply the model in this study, to improve their human settlement management practices, so as to achieve sustainability, and in essence, Sustainable Development Goal 11. It is hoped that the suggested management model will influence human settlement policy development and review, the designing of human settlement management programmes including the framework for their ongoing monitoring and evaluation. The study furthermore contributes to the development of housing and human

settlement curricula and evolving human settlement research in both developed and developing countries.

Key Words: ??????

Dedication

This research is dedicated to:

- My father, the late Adebayo Akinku ADENIRAN (I wish you were alive to witness this); and to my mother. Mrs Titilolawa A. ADENIRAN.
- All the people who must live in unfavourable conditions in human settlements, due to management challenges.

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Academic papers emanating from the study

Adeniran, A., Ibrahim, K., Mngomezulu, S., Mbanga, S. & Botha, B., 2019. 'An overview of SDG 11 as a ray of hope for the Nigerian informal settlers'. *Journal of African Sustainable Development* Vol. 15(2) pp 59 – 78.

Adeniran, A., Mbanga, S. & Botha, B., 2019. 'Towards a model for the management of sustainable human settlements in Eastern Cape, South Africa.' *Journal of Humanities and Social Sciences* Vol. 9(6).

Adeniran A., Ntombonina S. and Mbanga S. 2019. 'Low-income rental housing: A need for review of the South African Housing policy.' Proceedings of the South African Sweden Universities Forum (SASUF) Symposium pp 254 - 269.

Adeniran, A., Mbanga, S. & Botha, B., 2019. 'A management model for human settlements: A case study of Nigeria and South Africa' submitted to the *Town and Regional Planning Journal, UFS*

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List of Acronyms

ADB:	African Development Bank
BNG:	Break New Grounds
CBN:	Central Bank of Nigeria
CBO:	Community Based Organisation
CBOS:	Community Based Organizations
DHS:	Department of Human Settlements
FCT:	Federal Capital Territory
FGN:	Federal Government of Nigeria
FHA:	Federal Housing Authority
FLISP:	Finance Linked Individual Subsidy Programme
FM:	Facility Management
FMBN:	Federal Mortgage Bank of Nigeria
FMLHUD:	Federal Ministry of Land, Housing and Urban Development
FMWH:	Federal Ministry of Works and Housing
GEAR:	Growth, Employment and Redistribution Strategy
GRA:	Government Reserved Area
IFMA:	International Facility Management Association
LFN:	Laws of the Federation of Nigeria
LGAs:	Local Government Authorities
NBRRI:	Nigerian Building and Road Research Institute
NEEDS:	National Economic Empowerment Development Strategy
NGOS:	Non-Governmental Organizations
NHBRC:	National Home Builders Registration Council
NHC:	National Housing Corporation
NHFC:	National Housing Finance Corporation
NHP:	National Housing Policy
NURCHA:	National Urban Reconstruction and Housing Agency
O & M:	Operation and Maintenance

P & D:	Planning and Development
PCMM:	Planned Corrective Maintenance Management
PHP:	People's Housing Process
PMM:	Planned Maintenance Management
PPMM:	Planned Preventive Maintenance Management
PRMM:	Planned Reactive Maintenance Management
PRRMM:	Planned Routine / Refurbishment Maintenance Management
RDP:	Reconstruction and Development Programme
RICS:	Royal Institution of Chartered Surveyors
RSA:	Republic of South Africa
SHI:	Social Housing Institution
SPSS:	Statistical Package for Social Science
UN:	United Nations
UNCDF:	United Nations Capital Development Funds
UNCHS:	United Nations Centre for Human Settlements
UNDP:	United Nations Development Programme
UNEP:	United Nations Environment Programme
UN-HABITAT:	United Nations Human Settlements Programmes
UNICEF:	United Nations Children Fund
UNSD:	United Nations Sustainable Development
UPMM:	Unplanned Maintenance Management
WCED:	World Commission on Environment and Development summit
WSSD:	World Summit on Sustainable Development

Thoughts

"The prosperity of housing and human settlements will only materialise if technological innovations and initiatives are complemented by a fundamental change of attitude in management."

Ayo Adeniran

"I have walked that long road to freedom. I have tried not to falter; I have made missteps along the way. But I have discovered the secret that after climbing a great hill, one only finds that there are many more hills to climb. I have taken a moment here to rest, to steal a view of the glorious vista that surrounds me, to look back on the distance I have come. But I can rest only for a moment, for with freedom comes responsibilities, and I dare not linger, for my long walk is not yet ended."

Nelson Rolihlahla Mandela in Long Walk to Freedom

CHAPTER 1: THE RESEARCH PROBLEM AND ITS SETTINGS

1.1 Background of the Study and its Settings

This chapter outlines the research focus and it gives a summary of the methodology that the study will follow.

Rapid urbanisation, which is one of the defining phenomena of the twenty-first century, is not without its challenges, as evidenced in the developing countries (Abalaka, 2018:400). UN-Habitat (2003) predicted that in developing countries, future urban growth would be absorbed by urban centres stimulating a high annual average urban population growth rate of 2.3% compared to 0.4% in developed countries. United Nations (2014) also noted that over two billion people lived in urban areas in developing countries. It further stated that in Africa, the Caribbean and in the Pacific countries, seventy percent (70%) of the urban population live in slums or informal settlements. The rising trend of urbanisation poses significant challenges of how to deal with slums regarding the provision of housing, adequate essential services, infrastructure, and economic empowerment through job creation and general environmental quality, to both local and national governments of developing countries (Mitlin, 2003:404). UN-Habitat (2013) stated that at the centre of so many socio-economic activities, housing stands as an element of urban development, social acceptance and a growth mark of prosperity.

Traditionally, the focus on housing was on the "condition of housing", and the measure for this was household size, resilient dwelling units, overcrowding, tenure type, vacancy rate and multi-unit dwelling (World Bank, 2006). However, after the first World Summit on Sustainable Development (WSSD) which took place in Rio de Janeiro in 1992, the concept shifted to sustainable development with a focus on various environments viz natural and built environment. The built environment includes the human living environment of which housing is a part. Numerous international publications such as Agenda 21 and the Habitat Agenda reflects this (Moldan, Janoušková & Hák 2012:5).

This paradigm shift also reflected in the United Nations Millennium Development Goals (MDGs) 2005 which addressed housing as one of the targets of Goal number 7, with a focus on environmental sustainability (United Nations Department of Economic and Social Affairs 2008). This paradigm was further grounded in the United Nations Sustainable Development Goals (SDGs) where one of the goals, SDG 11 focused principally on "making cities and human settlements inclusive, safe, resilient and sustainable" (United Nations 2015).

In the 1976 declaration, the United Nations Agency for human settlements, UN-Habitat defines human settlement as: "the totality of the human community – whether it is a city, a town or a village – with all the social, material, organisational, spiritual and cultural elements that sustain it" (UN-Habitat 1976).

The term human settlements hence denotes all physical facilities and service institutions, including energy, housing, transport, employment, sanitation, communication, water, law and facilities of leisure, recreation, education, government, health and the arts (Devi, Lowry & Weber, 2017:59).

As early as five decades ago, the United Nations underscored the vital role of human settlement management in creating a living environment that is sustainable and it stated that the building of houses alone does not bring the desired change as it does not significantly improve the living conditions of both low and middle-income households (United Nations, 1969:vi). It further stated that human settlements management principles and practice: "community development, social improvement, proper maintenance and the upkeep of estates and sound financial arrangements for repaying loans and collection and carrying of charges," are necessary to achieve this. It indicates that human settlement management has a critical role in addressing the prevalent global housing crisis, specifically in developing countries and particularly in sub-Saharan Africa.

In developing countries, the growing urban centres and the population encounter inadequate provision of social housing and its management, and the situation is degenerating annually (Ebie, 2012:57).

As of 2015, the housing backlog of Nigeria and South Africa stood at 17 million and 2.1 million respectively while the two countries had an urbanisation rate of 4.78 and 2.04 between 2005 and 2015. With these figures, there is evidence that the gap between the housing demand and housing supply is on the increase while the capacity of the housing / human settlement agencies and stakeholders is inadequate to meet with adequate delivery. Furthermore, there is no evident improvement in the low-income group's housing conditions regarding tenure, affordability and access to essential services, despite several policies and programmes (Ibimilua & Ibitoye, 2015:53; Brueckner, Rabe & Selod, 2018:5).

United Nations (1969) indicated that concepts and practices should encourage community development, social improvement, proper upkeep and maintenance of estates and sound

financial arrangements for repaying loans and the collecting and carrying of charges. This arrangement is a clear admission of the essential role of housing management in tackling all the global housing crisis and housing development needs.

MacKay (2000:451) and Aziabah (2018: 100) asserted that there was very little comparative literature on housing management methods, as well as their relationship to the structure of housing organisations; and in general, housing management professionalisation has been outside the conventional academic research and debate.

Other researchers' findings corroborated the need for a housing management model, wherein management includes housing development management and Estate Management. For example, Kleinhans and Ham (2013) confirmed the view above, saying that there has never really been any apparent harmony on what housing management is and what it should achieve.

Clapham, (2017:95) reiterated that housing management is vague as a category of occupation; hence, the need for research so that housing management can be clearly defined, especially in the manner of practice in developing countries.

Van Wyk and Crofton, (2005:2); Clapham, Franklin and Saugères, (2010:80); Misnan, (2015:30); Silva, (2017:88); Crook and Kemp, (2018:2) and d´Alençon, (2018:94) also identified the lack of consistent procedure within housing management; the absence of precise definition, the roles and the boundaries for housing management; and the decisive timing for housing management towards achieving a more rigorous definition, to resolve the conflict around providing a welfare service and performance-based managerialism and commercial activities.

Kabir and Bustani, (2009) observed that several 'provider-oriented' government-driven strategies such as federal and state government housing schemes, slum clearances and resettlement adopted in Nigeria are suspected of having failed, as they have had no significant influence on social housing production in the country. In the same vein, Greyling and Verster, (2012:11) remarked that although the South African national policies are of a high standard and are well contextualised, they do however, lack implementation guidelines, and that can be seen in housing projects across the country.

This situation, as observed in the two countries, is due to the lack of consideration of a process that is strategic to the management of human settlement. Further, broader institutional issues, good housing maintenance practices and stakeholders' involvement are lacking. However,

Eaton and Ihuah, (2016:106) suggested that sustainability in housing estates (social) for provision and management is vital, but as yet, there has been no development of a conceptual framework or model to arrest this situation. Van Wyk and Wessels, (2014:104) identified that there are many policies, but they failed because of the absence of a tactical procedure for the management of human settlement for sustainability, which is vital.

Arising from this, this study seeks to proffer solution(s) while unpacking challenges of human settlements viz urban population and migration; informal settlements; political factors; public sector security; economic factors; urban and building obsolescence; power supply dynamics; climate change; property ownership; operational costs, sustainability and other burning issues facing human settlments management.

1.2 Problem Statement

Human settlements exist all over the world, and the challenges of successfully maintaining and managing them sustainably subsist. Moreover, continuous migration due to urbanisation continues to impact the various human settlements, thereby increasing the rate of their dilapidation. Some researchers such as Kaganova and Nayyar-Stone (2015:318-319) have alluded to decay in the elements of human settlements due to a shortage of best practice, political interference, insufficient legal and regulatory frameworks, the lack of commitment, the poor attitude of stakeholders and a lack of policy implementation, among others.

Other authors including Asabere (2007:1919); Becker, Dluhy & Topinka (2001:181); Farfán (2016:241); Tummers (2015:65); UN-Habitat (2013) and Van Wyk & Crofton (2005) have cited weak management, among other factors, as accounting for poor maintenance and for the poor quality of housing, which is the perceived significant component of human settlement. Hence, it can be stated that human settlement management practices contribute to the visible persistent deterioration in human settlements in Nigeria and in South Africa.

Although there is a bulk of literature addressing the quality problem in developing countries (Hendrik van Mossel & Straub 2007:487; Huang & Du 2015:218; Ibem & Aduwo 2013:163; Nieboer & Gruis 2016:282), there is inadequate knowledge about the establishment of human settlement management that has produced satisfactory outcomes. Belle (2017:971) presents a general plan of action for developing countries towards maintaining and modernising their housing stock. The plan comprises creating maintenance awareness, encouraging stakeholder participation, developing managerial methods for activities and getting feedback from

inhabitants. His study, however, did not consider how to fuse these requirements into an operational mechanism aimed at effective maintenance management. Likewise, Van Wyk & Crofton (2005) have proposed a model that in broad terms, outlines principles such as goals, enablers, and outcomes in housing management and Van Wyk (2014) further adapted this model for human settlements management and his model was more about role-playing and processes. Komu (2011) reports that the maintenance programme for the National Housing Corporation (NHC) of Tanzania could not be implemented due to insufficient funds, leading to the disrepair of most of the stock.

Whereas, in the Netherlands (Straub, 2004), England, (Newton & Tunstall, 2012) and Denmark (Kristensen, 2009), a wealth of knowledge of affordable housing management has produced proper maintenance and quality stock exists, none of them however, like studies of African countries, analysed the issues of human settlement management as contributing to the persistent deterioration and in the long-run, housing backlog. Hence this thesis aims to contribute to address the visible persistent deterioration in human settlements in developing countries by drawing lessons from these cases, as well as from housing, property, facility, city and urban management by extracting relatively effective policies from them.

1.3 Research Questions

   i. How are the state of integrated human settlements in Nigeria and in South Africa, and why?
   ii. What are the management and the maintenance principles currently used in the human settlement administration, why and by whom?
   iii. What are the various factors that influence human settlement management?
   iv. Are critical sustainability factors required for the sustainable management of human settlements, and how are these factors ranked?
   v. Would the integration of sustainability elements and an appropriate Estate Management method affect the management of integrated human settlements in Nigeria and in South Africa?

1.4 The Aim and the Objective of the Study

The Aim

This study seeks to develop and validate a management model for facilitating sustainable human settlements in Africa.

Specific Objectives

The specific objectives of the study were to:

i. Study existing human settlements in Nigeria and in South Africa;

ii. Ascertain the principles and the types of management (estate) and maintenance used in human settlements in Nigeria and in South Africa;

iii. Assess the various factors that affect human settlement management in Nigeria and in South Africa;

iv. Determine and evaluate factors that are beneficial to the sustainable management of human settlements in Nigeria and in South Africa; and to

v. Develop a feasible and workable sustainable human settlement management model that would enhance better living conditions and environmental quality in the study areas.

1.5 The Significance of the Study and the Contribution to Knowledge

With a sixty to eighty percent (60% to 80%) projection of emerging countries' populace living in shanties, slums and informal settlements (UN-Habitat, 2006:23), urban growth is faced daily with worsening housing conditions and management (Ha, 2008:351). Also, UN-Habitat (2010:x) suggest that there was no indication of the transformation of the housing condition regarding affordability, ownership, service standards and accessibility to the low-income groups. Concurrently, policies have been articulated to tackle these problems, yet the situation has not improved, (Ebie, 2012:57; Ihuah & Eaton, 2013) due to bureaucratic and political issues (Bolaji, Gray & Campbell-Evans, 2015:64).

With no remarkable impact on housing delivery process, Nigeria has adopted several policies towards housing among which are housing scheme programmes, resettlement and the clearance or the upgrading of slums (Aribigbola, 2008:125; Kabir & Bustani, 2009). In South Africa also, the rapid adoption of the Reconstruction and Development Programme (RDP) as a predominant background for the formulation and implementation of policy in a wide range of social and economic policy arenas, including housing has delivered many housing units but there is still much to be done in terms of housing delivery (Gbadegesin 2018:265).

The cause of policy failures is the absence of a tactical procedure for the management of human settlements for sustainability which is vital, yet no model to achieve this situation has been developed (Van Wyk & Wessels, 2014:104). Kamarazaly, Mbachu and Phipps, (2013:136)

identified the critical challenges currently facing management which included emergency management and business continuity planning, inadequate funding, operational efficiency, statutory compliance, sustainability and environmental stewardship, keeping up with rapid changes in technology, maintenance, human resources and identifying and meeting stakeholder needs.

The challenges faced by human settlement managers, as identified by the study are expected to unveil their functions as well as the overall operational performance and the public / stakeholders' dissatisfaction. The proper addressing of performance management for human settlements could minimise the challenges.

This study will explore, identify and fuse appropriate human settlement management practices that are considered adequate for the successful management of human settlements of Nigeria and South Africa particularly and third world countries in general. Besides this, the study offers a new approach for the effective management of integrated human settlements.

The application of factor analysis in the study will further benefit and contribute to the body of knowledge and to the human settlement management profession, as it will unveil multiple independent relationships that can positively impact the human settlement management role towards successful management of human settlements.

1.6 Delimitation of the Study

No research study can be all-inclusive, and this reiterates the need for clear study delimitation. This study will address, evaluate and compare the sustainability of human settlements and it will only explore the development of a model from a conceptualised angle of sustainability and Estate Management principles applicable in human settlements.

The empirical investigation was limited to the appropriate built environment professionals and stakeholders that are involved with human settlements management in Nigeria and in South Africa; to illustrate the different needs and approaches, with a view towards proposing an actionable management model. The decision to seek participation from these sets of people arises from the need to enhance the researches aim of developing a management model for sustainable human settlement for authorities and for practitioners alike. Furthermore, as a result of the lack of literature on human settlements management, this research will consider pieces of literature that speak to property management, social-housing management, Facility

Management and urban management, as all these elements make up the human settlement environment.

1.7 Assumptions of the Study

Assumptions denote the conditions that are taken for granted and are therefore accepted as true, without any proof (Leedy & Ormrod, 2015:66). Considering this, the under-listed suppositions provide a direction to the understanding of the research as conceptualised:

i. human settlement is an integrated concept that encompasses physical elements of shelter, infrastructure and services;

ii. conditions of settlements affect the living and the health conditions of the inhabitants and hence, they are sustainable, and they have a maintenance management unit or department;

iii. management systems for human settlements differ from nation to nation;

iv. management of human settlements will continue to operate within a tight budget and under resource constraints, to achieve sustainability in line with SDG 11;

v. the current indicators for sustainability will continue to be relevant now and in the future;

vi. the respondents are well-informed to give adequate and correct feedback on the information required;

vii. the findings of the study will benefit human settlements professionals in Nigeria and in South Africa, as it appears that the sector where they operate lacks strategic models for assisting management of properties; and

viii. the findings will empower any other property manager to deliver excellent service to their stakeholders.

1.8 Preliminary Literature Review

Worldwide, facing urban and rural regions is the critical issue of urbanisation, and the effect of this is that environmental, socio-cultural and economic challenges critically need a remedy.

UN-Habitat (2003a:24, 2006:16) estimated that in the developed regions of the world, forty-six (46) million people live in slums while in the developing regions, nine hundred and thirty-three (933) million people live in slums and seventy-four percent (74%) of the world's urban poor dwell in Asia and in sub-Saharan Africa.

These figures indicate that the developing climes face a poverty crisis, as indicated by the two percent (2%) per annum growth rate in the formation of slums in the world (UN-Habitat, 2006:188) and that this is rooted in poverty and inadequate housing, which is a result of insufficient and inadequate delivery. Van Wyk and Wessels (2014:6) ascribed the insufficiency and the inadequacy in housing delivery to inefficient human settlement management practices. They posited that the practices are occasioned by the fragmented body of knowledge, ambiguous definitions of human settlements management, the absence of a suitable model for human settlement management, inadequate education, the dearth of human settlements management professionals, a lack of capacity among practitioners and the absence of a professional body to regulate the profession; so as to ensure service excellence and the protection of consumers.

United Nations, (1969:vii) has stressed the critical role of human settlement management in creating sustainable living environments, by affirming that putting up the structures alone does not bring the desired change, except when sound management principles and practices are established and upheld. The organisation further reiterated that such principles and procedures should advance social improvement, community development, sound financial arrangements for settling bills and proper maintenance and upkeep of estates.

The reiteration is a distinct affirmation by an internationally renowned and respected organ of the vital role of human settlement management; in addressing the global housing crisis, and that housing delivery should not be regarded as an end-product, but rather as a critical fabric in the process of creating a sustainable human settlement.

Hence, the prevalent global housing crisis in sub-Saharan Africa validates the critical need for human settlements that allow an enhanced living environment and decent quality of life.

Furthermore, efficient and effective human settlements management is vital to address the global dilemma of insufficient and inadequate human settlement delivery practices, especially in Nigeria and in South Africa, as well as in other developing climes where limited resources are at the disposal of practitioners.

Nigeria has a housing backlog of 17 million with an annual shortage of 700,000 units, while South Africa has a deficit of 2.1 million and an estimated 1.5 million households living in slums (Rust, 2016:3). The backlog shows that the gap between the housing demand and the supply is widening, while the capacity of the government departments in charge of human settlements

as well as supporting stakeholders, is inadequate to keep up and to increase the rate of delivery. The gap reinforces the need for the improved and the successful management of human settlements for sustainability.

Each human settlement comprises a separate unit of control through fragmentation, but the whole group represents a single managerial entity (Roness, 2007:85). Despite this, some decentralisation of control is necessary for efficient management, and in such cases; a single authority directs and makes policies for the human settlements; and it is the function of supervision that it should be sub-divided for convenience. Besides, success depends upon the suitability of the estate (human settlement) organisation, the appropriateness of the units of management supervision, the smoothness of the delivery system of command from the higher to the lower levels of the ruling hierarchy, proper delegation of responsibility and other essentials of sound business management (Molloy 2016:27).

Although many authors have looked at management in its entirety, few studies have investigated the management of human settlement to develop models and or blueprints. The few that do include Obeng-Odoom (2011), Van Wyk (2014) and Umeora (2019) who also focused more on housing management, whereas housing is just one of the components of the human settlement space.

Van Dijk (2008:4) stated that urban management is a relatively new area of study, and it has received increasing prominence as a result of increased urbanisation, coupled with an upsurge of decentralisation agendas in modern times. He articulated city dynamics in the golden triangle of urban development, which is the result of migration and entrepreneurship, in a dynamic context, created by policies and urban managers.

Franklin (2000:907) only examined the structural context of housing management, as practised in the United Kingdom (UK), and he explicitly focused on the implications of the current social and legislative climate, before moving on to an analysis based on the social construction of the professional role of housing management.

Drawing on a social constructionist framework, Saugeres's (2010:93) study challenged the concepts of objectivity and rationality which are applied when justifying and legitimizing an unequal process of allocating scarce resources and it argues that the allocation and the management of housing is inherently subjective, where those involved are perceived to generate their own opinions and beliefs in their contacts with other stakeholders.

Another view by Jacobs and Manzi (2000:100) opined that as experts plan to apply 'best value' models in housing management, the measurement and the evaluation of all the aspects of service provision will have significant organisational consequences. Applying a constructivist perspective to a contemporary area of housing practice, they argued that the use of performance indicators (PIs) reconfigures traditional power structures and mechanisms of control within organisations and these can undermine management performance.

In a study of the nature of housing management practice in the UK, Clapham, Franklin and Saugères (2010:68) examined the definition and the delineation of the roles of housing managers and they socially classified the class and the extent of housing management in interaction with tenants and other professional groups. Their study argued that housing management plays a significant role in mediating between the state and the most disadvantaged and vulnerable sections of the population and as such, it must be treated as crucial.

Gruis and Nieboer (2003:210-211) also observed that strategic housing management lacked a theoretical basis and that publications of "good" practice are scarce. Their study filled this gap by defining the characteristics of strategic housing management, based on business theory and they discussed how the addition of a strategy appraisal stage is necessary to make Kotler's model more suitable for application in the asset management of landlords.

Ke, Su and Chang, (2012:293) however, averred that property management is a multi-discipline dealing with the property as a physical object or land and that although it has different meanings within different countries, it has three distinct primary objectives. The objectives are all focused on increasing land value, improving the safety of the work and living environment, as well as minimising resource waste and building maintenance cost. Hence, no matter how diverse the objectives of property management may seem, competence and collaboration between built environment professionals is crucial.

Hopkins, Read and Goss, (2017:374) viewed property management as an integral part of resource management and they revealed that third-party property management firms are increasingly promoting sustainability, despite the existence of perceived barriers, impinging on future efforts to reduce the environmental impact of the rental housing stock. They further revealed that some firms appear to be better positioned than others, to take advantage of sustainability initiatives, as a result of the types of properties that they manage and the characteristics of the owners who they represent. Hence their study, demonstrates that sustainable property management can be adopted by a wide variety of firms to improve the

financial performance of the assets that they operate, while simultaneously encouraging resource conversation and the responsible use of land.

Mukhtar, Amirudin, Sofield and Mohamad (2017:2050) argued that buildings (human settlement) should not be categorised as an overhead asset but it should rather be listed as part of the assets that need proactive management.

Mukori (2013:21) further describes that the main reason for property management is for operational purposes to be carried out, and this description fits globally. Mostly, property ownership is for different purposes, but the property manager has a social care and market-related duty for property requirements.

The position of Mukori further validates the multi-tasked discipline of property management and Lee and Scott, (2009:26) concurred, by saying that the complexity and the relatively demanding nature of maintenance management necessitates a well-structured strategy to support the core business of an organisation. The state of the buildings and their ability to continue to be functional throughout their useful lives is a manifestation of strategic and operational effort of an organisation towards the maintenance of its built environment assets.

In support of this argument, Marquez and Gupta, (2006:313) defined maintenance management as: "all activities of management that determine the maintenance objectives or the priorities, the strategies and the responsibilities."

Hence, maintenance management is a significant support function in building performance, because it guarantees the sustenance of a buildings' functional, structural, economic, and aesthetic conditions throughout their life cycle (Waziri & Vanduhe, 2013:23).

Facility Management is another critical function in the management of resources, support services and the built and work environment, it acts as a significant support function for the success of the core business of an organisation, and it covers a wide range of services and management (Chotipanich, 2004:364). The range of services it covers includes real Estate Management, financial management, change management, human resources management, health and safety and contract management (Parn, Edwards & Sing, 2017:47).

Maliene, Alexander and Lepkova, (2008:173) emphasised that Facility Management should be a process whereby an organisation ensures that its houses / buildings, systems and services support core operations and processes, as well as contributing towards achieving its strategic

objective in changing conditions. Lee and Scott, (2009b:31) also described Facility Management as a critical function that incorporates all property-related functions and the supporting activities of maintenance, performance and strategic management. Therefore, it can be indicated as entailing a mix of technology, people, and support services directed towards the accomplishment of an organisation's assignment; and the direction, the organisation, the coordination and the supervision of the technology, people, systems and services must be performed by a manager. Hence, the relationship between property management and Facility Management emerges where they both use management principles such as planning, coordinating and directing, in achieving organisational objectives.

Tse (2014:2) opined that: "strategic management is a process that includes top management's analysis of the setting in which the organisation operates before formulating a strategy, as well as the plan for implementation and control of the strategy." Therefore, the place of strategy is vital in property management.

Lind and Muyingo, (2012:15-17) identified the use of different strategies in maintenance as corrective maintenance, planned maintenance, opportunistic maintenance and preventive maintenance. A formulated housing maintenance strategy, which makes up the maintenance policy is a tool to ensure proper planning for any maintenance strategy in the maintenance activity.

Rabii, Naoufal and Omar (2018:20) described the necessary aspects to take into account in order to consider the modelling of a scientific and exhaustive maintenance problem as follows:

1) The recognition of the problem and the aim of the study;
2) The agreement and the enumeration on the required data for the study;
3) The design of the system for the future withdrawal of data (if required);
4) The preparation of the data and the information to fit the models;
5) The benchmark of the data with other sources or alternatives;
6) The formulation of suitable maintenance policies using the models;
7) An explanation of the process followed by the maintenance manager; and
8) The discussion of model results and model utilisation payoff analysis.

Hence, one can find a variety of models generally devoted to several vital areas or problems within the maintenance management, but none of these authors has taken a look at the management of human settlement for sustainability, using Estate Management principles to meet Goal 11 of the SDG, and hence this research seeks to fill that gap.

1.9 Research Design and Methodology

To evaluate stated propositions and qualify research objectives, data collection was from diverse sources. The sources are crucial for the study to achieve its identified aims and objectives by seeking answers to the research questions.

Secondary Sources

The analysis of secondary data is the method of re-examining available evidence (Heaton, 2008:34), and it is usually done on quantitative and qualitative data (Almalki, 2016:290). The use of previously presented facts is a valid source of information and mitigates the necessity for accessing resources for new frontiers and further research (Babbie, 2008:375). Babbie (2008:375) and Walliman (2011:71) view it as a resource that can be utilised in its original form or re-processed to allow insight to further research. However, when utilising secondary analysis, there should be the consideration of several factors.

Walliman, (2011:71) stressed the importance of gaining an understanding of the purpose and the theoretical perception of previous researches, while establishing their appropriateness for the current research. Heaton (2008:34) and Davidov *et al*. (2014:56) reiterated the use of data that only meets appropriate benchmarks of validity and reliability. Factors germane to validity consists of the relativity of the original sample size, and the use of indices, terms, and definitions that are appropriate for the current study (Babbie, 2008:375). Reliability regarding the understanding the thoroughness of research methodology engaged in the collection as well as the analysis of the primary data is vital (Walliman, 2011:39,87).

With no identified model from preliminary literature to effectively manage human settlements and to identify various attributes that could impact on the successful management of human settlements, a wide range of literature was reviewed. Such literature was from various aspects of the built environment and other relevant disciplines, ranging from property management, Facility Management, construction management, spatial planning, sustainability, strategic management, quality management, journals, articles, policy documents, past dissertation and theses to other relevant documents that were the primary sources for retrieval of secondary data.

Primary Sources

To further examine the preliminary findings derived from existing literature and concluded research findings on sustainable human settlements management, primary data was sourced using structured questionnaires.

The questionnaire was developed based on the reviewed literature and then it was administered to the relevant respondents involved in the management of human settlements and / or its components from Nigeria and from South Africa. An analysis of the raw data from the survey was done through the use of statistical procedures, and the validity of findings arising from the questionnaire was tested using factor analysis as suggested by the work of DiStefano and Hess, (2005: 225).

Population and Sample Sizes

Idris, Richard and Waziri, (2016:251) identified that there is no clear population of objects as well as the sample size suggestion. However, the right sample size signifies a relevant part of the research authenticity. Hence, it becomes imperative to identify and to determine the subject of reality, in the research environment.

The word population denotes a whole set of objects with members who share similar and or specific characteristics. In the milieu of research methods, the population includes every entity that fits the criteria laid down by the research.

A small group may constitute a population if the research criteria set for belonging to the group are strictly defined (Saumure & Given, 2008:644). The choice to study a whole population or a fraction (sample) of it will depend on the best possible approach that will address the research questions appropriately (Saumure & Given, 2008:644-645). A sample constitutes a set of data drawn from a population of likely data sources. Selecting a sample begins with defining the population that is eligible for inclusion in the study (Morgan, 2008:797).

The research population of this study comprises professionals and stakeholders who are involved in human settlement management in Nigeria and in South Africa.

Blaikie (2010:178) declared that the purposive sampling technique is a non-probability method that is used to select cases for a study, based on the researcher's judgment of the appropriate cases; for instance, selecting a variety of types of cases for in-depth investigation. Heaton, (2008:34) confirms that a purposive sampling approach permits a careful selection of

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participants in studies that can best generate the theory and the understanding of the specific social process that one is studying.

The purposive sampling approach allows the selection of respondents due to their specific experience and knowledge of human settlements, either as professionals, policy formulators or relevant stakeholders from Nigeria and South Africa.

The population size of this study is approximated to be five thousand (5000) or more. Hence to reach a satisfactory response ratio, the questionnaire distribution was for the various human settlement management professionals, in both private and public enterprises, via a web survey. The primary goal is to be able to obtain a minimum of three hundred and fifty-seven (357) potential research participants from the case study. The rationale behind this sample is as observed from Krejcie and Morgan (1970).

The Analysis and the Treatment of the Data

Data analysis consists of investigating, classifying, charting and / or recombining the evidence to address the initial study propositions (Yin 2013:160).

A research questionnaire was developed decisively to address critical topics, as it relates to the human settlement management profession. Likert type scale was used to measure all the variables. An empirical factor analysis was performed to confirm the validity of the instrument and to identify the unique factors in the data gathered.

Research Methodology

In defining research methodology, Sapsford and Jupp, (2006:305) noted that it is a philosophical perspective that motivates and informs the research style. Leedy and Ormrod (2015:74) states that facts or data are needed to solve any research problem and that these facts contain desirable aspects of truth. Hence, it is the research methodology that informs a proper global perspective, approaches, designs, methods and analytical instruments for a research process (Schensul, 2008:516). As the data required for this study comprised both numerical and direct observations, both descriptive (qualitative) and analytical (quantitative) methods were used. However, in order to further aid the extraction of data that would most adequately address the research questions, a case study approach was adopted.

Oates (2006:143) offered four fundamentals described by the case study research to include:

(i)   Focus on in-depth rather than on breadth.

(ii)   **Natural setting:** the study is carried out in its natural environment and not in a laboratory.

(iii)   **Holistic study:** the researcher recognises the complication of social truths.

(iv)   **Multiple sources and methods:** the researcher employs several data sources.

A case study research (CSR) is a comprehensive examination of a single case – such as a policy, programme, an intervention site, an implementation process or a participant (Yin, 2014:206). Woodside (2010:2) simplified a CSR as an inquiry that focuses on describing, understanding, predicting, and controlling the individual (that is process, animal, person, household, organisation, group, industry, culture, or nationality).

Yin, (2014:285) further classed case studies into three categories viz:

(i)   **A descriptive study:** which seeks to describe and analyse a phenomenon.

(ii)   **An exploratory study:** which is used to define the questions, as well as to assist a researcher in understanding a research problem. Yin, (2014:285) clarified that this method occurs when the research topic is relatively new, or when the topic has suffered from a dearth of information and literature.

(iii)   **An explanatory study:** this provides more of an explanation than a descriptive study does. It is "trying to explain why events happen as they do, or why particular outcomes have occurred" (Oates, 2006:143).

Case studies respond better to the "how", the "why" and the "what" questions of this research towards realising its aim and its objectives (Yin, 2014:254). The method also entails numerous sources of data, comprising records, consultations, direct and physical observations.

The approach affords the prospect that the study is undertaken in such a manner that it amalgamates the views and the participation of the respondents in the field of study (Yin, 2014:254). Furthermore, a case study approach helps to deal adequately with all varieties of evidence such as interviews, documents, and questionnaires and it makes no provision for the researcher to manipulate the behaviour of the participants and / or the environment and yet it allows the researcher to investigate the participant's behavioural patterns (Yin, 2014:256).

A case study method using the exploratory and the explanatory strategy offers in-depth detail and a possible understanding of the various impacts of independent variables on dependent

variables. As a result, the case study design will offer a better opportunity to develop a model for the management of human settlements.

Zartman (2005:13) expressed that case studies are undertaken over time and that they lay emphasis on comparison within and across environments. He further posited that it involves the analysis and the synthesis of the similarities, the differences, and the patterns across two or more cases, that share a common focus or goal.

Goodrick (2014:2) postulated that case studies often incorporate both qualitative and quantitative data and based on its attention on generating a good understanding of the cases and the case context, procedures such as fieldwork visits, observation, interviews and document analysis often have dominance among the various data collection methods employed.

Case studies cover two or more cases in such a way that the results can be globalized for causal questions of how and why particular blueprints, programmes, guidelines, or policies work (Babbie, 2008:33; Campbell, 2012:174; Cresswell & Clark, 2011:116; Thomas, 2011:517; Goodrick, 2014:3–7; Gale, 2015:87; Bryman, 2016:6).

Yin (2011:3) further opines that this method is very appropriate when the researcher trusts the background to be extremely useful to the study. Hence, the justification for the choice of such a procedure that allows for 'cross-national' comparisons in the management of sustainable human settlements in Nigeria and in South Africa and to draw up a model based on the findings (Lor, 2011:2; Davidov *et al*., 2014:57-58). Equally important, is that case study approaches are recognised as allowing for the examination of a variety of perspectives, to demonstrate a social pattern and to assess ideas and processes (Yin, 2009:260; 2012:145; 2014:285). This research methodology will allow for an understanding of the operations of human settlement organisations and institutions, of their practices, as well as policy enactment and studies from Nigeria and from South Africa (Kennett, 2001:63).

The use of various information sources, ascertaining a series or a sequence of evidence, pattern harmonising, explanation building, highlighting and amplifying variations and applying replication logic have been identified as techniques for multiple case studies (Hantrais, 2008:57; Gerring, 2009:101). Regarding case study methods, consideration is given to the need for a transparent, vigorous and impartial process of data analysis, with an explicit demonstration of carefully selected and appropriate information (Kennett, 2001:65; Hakim, 2012:63; Yin, 2013:202).

A possible recognised flaw in the case study approach is its fairness and its susceptibility to being manipulated towards the researcher's perspectives (Byrne & Ragin, 2009:4; Becker, Bryman & Ferguson, 2012:117). To address this concern, DePoy and Gitlin (2016:19) stated that it is important to maintain as objective a perspective as possible throughout the study.

Research Ethics, Validity and Reliability

Sutrisna (2009:56) posited that the subject of ethics in research is dependent on the behaviour of the researcher towards the rights of the respondents. In research, this determines the level of credibility that a study will be accorded, based on the resulting outcomes. As a result of this, the ethical issues underscored by Leedy and Ormrod (2015:101) will guide the researcher during this research, by religiously following ethical issues such as informed consent and the right to privacy and honesty.

Furthermore, Sutrisna (2009:55-56) indicated that validity refers to whether the recognised responses within their traits, produced the expected result, and beyond this, to know the degree to which the findings can be generalised, outside the research environment. Validity has to do with whether the methods, the approaches, and the techniques of the researcher truly express or measure the issues that the researcher has been exploring. Similarly, David and Sutton (2004:173) indicated that validity is determined by how representative the sample is and how appropriate the size of the sample is, from which the findings are derived. This research was designed to reflect the above issues, as raised by these authors.

Yin (2013:45) states that the spirit of reliability endeavours to guarantee the same findings and the same conclusions if an independent researcher conducts the same research using the same procedure. However, he suggests that case-study research can enhance universality by using multiple-case studies and hence, this study will adopt it.

1.10 Outline of the Chapters in the Final Thesis

The structure of the research is in seven chapters.

Chapter 1 introduced the research by identifying the critical problem under investigation. It stated the general and the specific objectives and postulate the relevant research questions. It further defined its scope, given a justification for the topic and it will outline the limitations of the research. This chapter is vital to the study, as it put the study into perspective and helped to check deviations.

Chapter 2 gave a review of the relevant literature on the objectives and the types of human settlement maintenance management, the philosophies and the procedures of human settlement management, as well as ownership systems in Nigeria and in South Africa. The chapter concluded with a summary which will dovetail into the next chapter.

Chapter 3 gave an overview of the theoretical framework of perceived successful human settlement management by considering various variables.

Chapter 4 focussed on the research design, the data requirement and the source of the data, the research instruments employed, their validity and their reliability, the target population, the sample and the sampling procedures, the data collection procedures and the data analysis procedures.

Chapter 5 provided the presentation, the analysis, and the interpretation of the data collected in the field.

Chapter 6 linked the theoretical and empirical research and it introduced the management model for human settlements.

Chapter 7 drew conclusions, based on the research questions and aims and it made further recommendations towards enabling sustainability in human settlements.

1.11 Definition of the Key Terms

Sustainable Development: The Brundtland Commission defined sustainable development as the: ability to make development sustainable—to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED. 1987).

SDG 11: SDG 11 refers to one of the new goals which has universal applicability and it is expected to mobilise efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind. SDG 11 is one of the goals, and its primary objective is to make cities inclusive, safe, resilient and sustainable (United Nations, 2015).

Human Settlement: Throughout this thesis, this term refers to the totality of the human community – be it in the city, a town or a village – social, material, organisational, spiritual and cultural elements that sustain it (UN-Habitat, 2013).

Urban Management: According to Van Dijk (2008:5), urban management denotes the effort to coordinate and to integrate public and private actions, to resolve the challenges confronting

the inhabitants of cities in an integrated way, to attain a better and a more competitive, equitable and sustainable city and this research will use this definition.

Maintenance: Maintenance is the combination of technical and associated managerial actions, aimed at retaining a building component in (or restoring to) a state in which it can perform its required function (Thaheem, De Marco & Mughal, 2013:183). This research study will align with this definition for the purpose of this study.

Urbanisation: In this thesis, urbanisation is identified as a global phenomenon that is transforming human settlements. It is a process that involves simultaneous transitions and transformations across multiple dimensions, including demographic, economic, and physical changes in the landscape as stated by Seto *et al*., (2014:929).

Estate Management: In this thesis, the term Estate Management refers to the direction and the supervision of an interest in land and landed property with the aim of securing optimum return which may not always be financial but it can be a social benefit, status, prestige, political power or some other goal or group of goals (Olajide, (2017:104).

Property Management: While there are a variety of definitions that has been given to property management; having identified it as a very demanding and a challenging profession, this thesis identifies it as involving organising an efficient system as well as directing, coordinating and controlling all the skills available towards maximising income from a property and at the same time, ensuring maximum protection of its fabric from deterioration and wastage, through proper upkeep and maintenance (Baharum, Nawawi & Saat, 2009:162).

Facilities Management: The term Facilities Management will be referred to as a profession that encompasses multidisciplinary teams to ensure the functionality of the built environment by integrating people, place, process and technology as defined by the International Facility Management Association (IFMA).

Human Settlement Management: Human settlement management for the pupose of this research is the art, the science, and the profession of coordinating role players, in protecting the interests of households and communities and managing human settlement processes; using appropriate policies, strategies, systems and resources; with due cognizance of all the contextual circumstances (natural, social, cultural, economic, political and technological) to contribute to household and community development and to optimum human settlements'

sector performance towards a new and improved sustainable human living environment (Van Wyk, 2014:224).

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In order to provide the theoretical underpinning for the research, an appraisal of related literature concerning the research area is essential for articulating current understanding. This chapter starts with a global analysis of and reviews of works of literature on property management and urban management. It also considers management and maintenance types, the methods, the ideologies, and the practices of human settlements as well as human settlement (housing) policies in Nigeria and in South Africa. A summary of the positions of the works of literature examined concludes the section.

2.2 Global Analysis of Property / Urban / Facility / Human Settlements Management

Property is a global phenomenon, and in uniformity with Ferreira (2012:146), the globalisation process cannot be disregarded by any country, as it compels competitiveness by governments and its agencies. Property investment is also rapidly becoming a global theme as well, and the focus of several countries is on attracting foreign investors to this sector (Razali & Juanil, 2011:320).

Li, (2010:86) perceived that property management is a post-construction localised service, which includes cleaning common areas, refurbishing and maintaining facilities, and gardening. He argued that property management has a more prominent role than that and that the roles are not restricted to waste and energy reduction. Moreover, Ke, Yeh and Chang, (2014:1413) highlight property management as comprising property service, dynamic line management, items of public equipment and community construction.

The literature validates that property management is viewed and it is interpreted in different ways, depending on the nature of the organisations and the countries as some refer to a property simply as real estate and others practise Facility Management, asset management / control, property development and resource management and more recently human settlement management to develop and to sustain a property.

However, regardless of the name, Oladokun and Olaleye, (2018:23) posited that its primary function is to guarantee that the real estate assets contribute towards achieving the overall objectives of an organisation. The position is a further reiteration of Ke and Su's (2011:319) position that property management objectives take account of enhancing the safety of the work

and living environment, increasing the value of land and decreasing the cost of building maintenance and resource waste.

It is crucial to review the global environment of property management in order to have a benchmark towards identifying gaps, which would in turn, influence the construction of the conceptual model for the management of human settlements.

The United States of America (USA) municipal system has numerous service districts responsible for service delivery (Bel & Fageda, 2010:130) and the system is adjudged to be the most dynamic, innovative and structurally diverse level of government (Cox, Gabris, & Levin, 2010:325). In the 1950s and 1960s, the government-sponsored urban renewal programmes were followed by landlord abandonment in the 1970s (DuPuis & Greenberg, 2019:4). The execution of gentrification and low-cost development produced large-scale luxury housing projects, and the community had to contend with civil rights, labour, and radical civic and political movements that developed in New York City during that period. In America, metropolitan areas are expected to adopt certifications of Leadership in Energy and Environmental Design (LEED) and Energy Star, especially new construction in such areas (Eichholtz, Kok & Quigley, 2016:332).

There is a new wave of urban renewal projects currently in Canada (Addie, Keil & Olds 2015:39) and this is good for economic conditions, due to its intrinsic merits and demerits, although it might be hazardous for property investment purposes. Linnerooth-Bayer & Mechler (2011:69) also reported that countries such as the USA, Canada and Australia often carry insurance cover for their public assets as against what is obtainable in other wealthy nations. They posited that this was because citizens take responsibility for the insurance of their assets to avoid or to reduce massive losses in the event of natural disasters.

Within the same region, Cohen (2006:68) observed that countries in Latin America, are experiencing expansive urban growth which exerts pressure on the existing infrastructure. This pressure affects public health, buildings, road networks, transportation, water quality and waste management (Grewal & Grewal, 2012:2-4). As recorded by Aguilar and Santos, (2011:262), Mexico City reveals that for the urban poor, housing, public works and service infrastructure is poor, and they discovered that the city is experiencing a high level of urban influx population despite the building of cyclone fences to establish urban zones and environmentally viable areas, but the need for services and infrastructure keeps putting significant social pressures on

the City. Although such strategies were valuable in the short-term, such urban and environmental standards have been overrun by political pressures.

In Europe, the Facility Management (replaced with the terms "maintenance" and "management" of facilities in operation) market appears to be developing daily (Milosavljević, Čongradac, Veličković & Prebiračević, 2012:271). In Serbia, however, it has been practised for a long time, and it is not an entirely a new concept there (Milosavljević *et al*., 2012:269).

In the Netherlands, property management companies' activity goes beyond the core business of managing the property, it focuses more on contributing to the quality of the neighbourhoods (van Overmeeren & Gruis, 2011:191).

The literature on urban population influx reveals that people in search of economic justice are migrating to cities in large numbers, and this brings a different challenge. However, Hendricks (2015:251) reported that Germany is an exceptional country when it comes to this, as the country is experiencing large migration movements from East to West Germany. Hendricks records that cities and municipalities had lost between twenty to twenty-five percent (20 to 25%) of their population since the German reunification. Coupled with a low birth rate which is standard in Germany, Hendricks concluded that the shrinkage in population does not leave much room for property management.

Blomé, (2010:321) revealed that Swedish Local Government owns over 885 000 rental apartments, which represents twenty-two percent (22%) of the total housing stock in that country. Blomé identified that economic and social aspects are crucial factors impacting on property management and it appeared that Sweden is invulnerable to such influences as the orientation of the housing sector market shows less regulation by the government than in other countries.

Local governments in Italy own a substantial amount of real estate, and the citizens perceive housing as an essential good. As a result, house owners leave their houses only when it is seriously necessary (Salvo, Ciuna & De Ruggiero, 2014:139; Vermiglio, 2011:426). Vermiglio, (2011:426) further noted some of the challenges faced by Italy's local government include increasing budget constraints, a lack of amalgamated commencement of real estate portfolios due to deprived funding, as well as bureaucratic procedures for property disposal, which significantly affects property management activity.

In the United Kingdom, the district councils offer funding schemes on a smaller scale to preserve historic buildings only (Cheung & Chan, 2012:177). The scheme intends to preserve and to ensure excellent and innovative use of buildings; thus, transforming these buildings into landmarks and promoting active public participation in the conservation of historic buildings; and creating employment opportunities, predominantly at the district level.

The techniques associated with Facilities Management in Asian countries are applied gradually, based on it being perceived as a vital area in business (bin Syed Mustapa, Adnan & Jusoff, 2008:79). In Asian countries, particularly Hong Kong, Malaysia and Singapore, the field of Facility Management (FM) has been extensively developed and practised by property developers compared with the West (bin Syed Mustapa, Adnan & Jusoff, 2008:80).

In Taiwan, property management has become a critical research interest in the building management and maintenance industry (Ke, Su & Chang, 2012:292). Furthermore, due to the small proportion of tax levied on overall residential development costs, properties are more affordable (Chan & Chen, 2014:156).

The property management concept in Hong Kong is comparable to that of other developed countries (Li, 2010:88). The practices include the consideration of a building's use, its age, its quality, its location, its size, its strategy and the proficiencies of the property management company. Possibly, the hope for Facility Management to develop in Hong Kong lies in the reality that this is the city where 'East meets West' (bin Syed Mustapa *et al*., 2008:80) which opens it up to multi-cultural ideas.

One of the most significant components, contributing around fifteen percent (15%) of Iranian GDP is housing, and real estate services and its management delivers a lower risk to reward ratio (Masron & Fereidouni, 2010:7).

Africa is unique, and every country has its own rare or unique experiences (Berrisford, 2011:248) and primarily, governments have been hesitant to transfer full property rights to the people.

With urbanisation, the Democratic Republic of Congo, (DRC) is grappling with a rise in informal settlements and this results in difficulty in building sustainable neighbourhoods (Eric *et al*., 2014:254). The sad reality is that the DRC cities are not geared to manage internal population growth and the authorities have lost control of urban development, architectural

design and the future of housing (Eric *et al*., 2014:255), and there is a need for development and execution of a new urban policy.

Tanzania's urban centres continue to grow but urban planning is unable to keep up with the growing demand for land services, for instance, in Dar es Salaam, informal settlements account for about seventy percent (70%) of its dwellings (Collin, Dercon, Lombardini, Sandefur & Zeitlin, 2012:2).

Nigeria, the most populous African nation, has one of the highest urban growth levels, globally, with a current phenomenal increase of the Nigerian population in urban centres (Olotuah & Bobadoye, 2009:51). The resultant effect of the increase is severe housing problems: overcrowding and many poor dwellings. Additionally, the rapid population growth has created numerous housing problems (Gbadegesin & Ojo, 2011:171), which results in severe insufficiency in housing units and a near-complete breakdown of urban infrastructure. Unfortunately, as a result of this challenge, households resolve to share accommodation, and the result is the multiplication of unmanageable tenants.

The advent of democracy in South Africa has previously provided marginal racial groups with economic improvement, and this has resulted in the rapid growth of black people classified as middle-class, seeking high-quality housing (Prinsloo & Cloete, 2002:264). Hence, most suburbs that were previously occupied by white people are now also occupied by members of the black middle-class.

However, land ownership and tenure, development and use continues to play significant roles in creating the spatial planning problems faced by South African towns and cities (Berrisford, 2011:249).

2.3 The Concept of Human Settlement and its Management

The sustainability of any human settlement primarily rests on the management philosophy, procedure, opinion and personal qualities of those involved (Banfield, 2014:34). Other factors such as physical, institutional, legal and economic characteristics (DeLisle & Grissom 2017:290; Emerole, 2018:5; Glumac & Des Rosiers, 2018:75) are essential to the failure or to the success of human settlement management and hence the success and the sustainability of human settlement benefits will be dependent on them. In understanding human settlement and its management, there is a need to strengthen the relationship between sustainability and human settlement management / maintenance philosophies and procedures.

2.3.1 Human settlements defined

Human settlement is a concept that has evolved over the years and it has become a strategy for socio-economic development in the framework of formulating global shelter strategies. There is an accord that human settlements are not only about spatial attributes but also about the physical indication of economic and social activity. Settlements are a critical basis for socio-economic development in the sense that: "places, where people can live, learn and work in conditions of safety, comfort and efficiency is a fundamental and a elementary need" (UN General Assembly, 1976; UN-Habitat I 1976:8).

The concept of 'human settlement' was coined at the Vancouver Conference of 1976 as the: "totality of the human community whether city, town or village with all the social, material, organisational, spiritual and cultural elements that sustain it" (UN-Habitat I 1976:8). The structure of human settlements consists of physical elements, social services, and infrastructure. The physical components consist of shelter which is human-made and varies in size, composition, and types and built for privacy, security and protection against adverse weather within a community. The community requires social services such as education, health, welfare, nutrition, and recreation. Lastly, infrastructure is: "the complex network designed to deliver or to remove from the shelter people, goods, energy or information" (Sarkar, 2010:2). The Vancouver declaration stated that: "adequate shelter and services are a basic human right, and that use of land should be subject to strict public control, with governments assisting local authorities to contribute to national development" (UN-Habitat 1976:28). Arising from the definition and for this study, human settlement will be likened to an estate as indicated by Nwanekezie, (1996) that includes a large parcel of land and its appurtenances owned by a nation, the community, a body corporate or by individuals.

2.3.2 Characteristics of human settlements

With human settlement defined, it is imperative to state that management problems, as well as its continuity, are essential to its character. Hence, the features of the human settlement defining its management challenge have several contextual issues as they relate to real estate by Olajide (2017:12) as shown below.

2.3.2.1 Physical identity

The physical elements of a human settlement have an impact on the difficulties of its management. Such elements as its size and its shape are indispensable to the terms of control

between a smallholding of a hundred square meters and a ranch that may cover several hundred square kilometres. The extent of improvement and development of land from its natural state also forms part of its physical identity.

2.3.2.2 Economic character

Human settlement management is an economic process, and its features largely govern the course of management. Among the most important are its use; the extent of its development and profitability in absorbing capital investment; its income and its returns; the debt loading of the estate and the availability of further credit; and the trend towards physical or functional obsolescence. Hence, economic factors influence human settlement management. There should be a constant alteration of plans to adapt to economic changes (Lind & Muyingo, 2012:24), as these changes determine what actions should be taken on a specific building. Inasmuch as human settlements may require upgrading to keep up with energy efficiency, if a nation's economy is on the decline for example, then the goal of eliminating greenhouse gas emissions will be put on hold. It is, therefore, appropriate to allow for cash flow for improvement, renovation, development or redevelopment from time to time, to maintain or to improve its income-generating capacity as well as its aesthetics.

2.3.2.3 Legal status

A human settlement presumes certain rights enforceable by law, and it is this legal character that determines the degree and the quality of control. Ownership may mean a lot or a little but, for practical purposes, an owner is the person, the group of persons or the body, who is able to exercise power over property and therefore it is concerned with its management. The basis of management will depend on the form of rights, privileges, and obligations that subsist in the estate, and these must be clearly understood if they are to be used to maximum advantage. However, rights of ownership cannot be isolated, but should be observed within the legal framework which they form a part of. Also, no legal system exists in a vacuum; it is the product of various social, ethnic, religious, economic and political metamorphoses, which govern the choices and the decisions of a society.

2.3.2.4 Managerial character

Each estate comprises a separate unit of control. Even though an estate may be fragmented, as in the case of a chain of multiple stores, where the overall direction is unified, the whole group represents a single managerial entity.

However, it happens where there is a substantial or a divided estate, where some decentralisation of control is necessary for efficient management. In such cases, the direction and the policymaking of the estate devolves in a single authority and for convenience it can be subdivided.

Success in these circumstances depends upon the suitability of the estate organisation, the appropriateness of the units of management supervision, the smoothness of commands from the higher to the lower levels of the ruling hierarchy, proper delegation of responsibility and other essentials of sound business management.

2.4 Definition of Management

Research into management has a long history, and several authors have viewed it from different angles, with different thinkers emphasising different beliefs. The Taylor school of thought laid emphasis on the aspect of engineering management, Mayos's emphasis was on the aspect of human relations, Brech and Terry focused on decision making, Davis cantered on the leadership aspect while others like Richman emphasised areas of integration and coordination (Riaz & Hameed ur Rehman, 2017:162).

More broadly, management is the process of designing and maintaining an environment in which individuals, working together in groups, efficiently accomplish selected aims (Koontz & Heinz, 2010:2-3). Firstly, this definition means that as managers, people carry out the managerial functions of planning, organising, staffing, leading, and controlling. Secondly, management applies to managers at all organisational levels. Third, management applies to any organisation. Fourth, the aim of all managers is the same - to create a surplus, and it aims at effectiveness and efficiency to achieve productivity.

Jonathan Falkingham had this definition of sustainable property management as: "the location, design and development of property which is economically viable, environmentally responsible and which has a positive, material effect on the quality of life" (Hopkins, Read & Goss 2017:363).

For this research, the skill of controlling; directing; planning; coordinating; motivating; forecasting; organizing; and communicating various activities, aimed at achieving a set objective denotes management (Oladokun & Ojo, 2011:305; Gbadegesin & Ojo, 2011:67; Razali & Juanil 2011:372) such as human settlement management activities or a project activity. Van Wyk and Wessels, (2014:166) also fortifies the opinions of the authors above in

their definition of management as the process of utilising resources to achieve specific objectives, through planning, organizing, leading and controlling. Management entails the use of the objective and the subjective intuition of the manager, enabling him or her to adjust to change as well as changing situations, in the discharge of his duties. The reason for this is because each human settlement is unique and the management option adopted, coupled with the managerial personality, and the available resources for any one project will differ from others (Banfield, 2014).

2.4.1 Human Settlement Management Principles

The methods used in the management of a human settlement will be the same as the general management ideologies (Palm 2017:55; Scarrett, 2011:38, 247). The controlling role comprises co-ordination, reporting and budgeting, which then expands to seven management functions which Luther Guelick coined POSDCoRB, which represents the first letters of the seven functions, i.e. P for Planning, O for Organizing, S for Staffing, D for Directing, Co for Co-ordination, R for Reporting and B for Budgeting (Chalekian 2016:319).

Figure 2. 1 Management principles adapted from Chalekian (2016: 319)

2.4.1.2 Planning

Planning is future-oriented, and it determines the direction of an organisation, and it is the way that the decisions are made rationally and systematically today to shape the future. It is an organised foresight which also gives corrective hindsight. It involves the predicting of the

future, as well as attempting to control the events. It involves the ability to foresee the effects of current actions on the future. Drucker (2007:3) has defined planning as follows: "Planning is the continuous process of making present entrepreneurial decisions systematically and with the best possible knowledge of their futurity, organising systematically the efforts needed to carry out these decisions and measuring the results of these decisions against the expectations through organised and systematic feedback". An effective planning program incorporates the effect of both external as well as internal factors. External factors include shortages of resources; both capital and material, the general economic trend regarding interest rates and inflation, dynamic technological advancements, increased governmental regulation regarding community interests and unstable international political environments.

2.4.1.3 Organising

Organising involves a formal line of authority with the direction and the flow of that authority, through which work sectors are well-defined, set and synchronised so that each part is in tandem to the other part, in an integrated and coherent manner, to enable them to attain the prescribed objectives. Mills *et al*. (2016:68) stated that to organise a business means providing it with raw material, tools, capital and personnel and everything useful for its functioning.

Thus, the purpose of organising encompasses the determination of activities to be executed, in order to reach company goals, correctly assigning and delegating these activities and authority to the appropriate personnel, to carry them out in a coordinated and cohesive manner.

2.4.1.4 Staffing

The role of hiring, retaining and firing an appropriate workforce for an organization at levels devolves on the staffing function. It includes recruiting, training, developing, compensating and evaluating employees, and maintaining the personnel with proper motivations and incentives. Since the human element is the most vital factor in the process of management, it is essential to recruit the right personnel.

Koontz and Heinz, (2010:211) argued that to handle the organization structure, the core function of the manager in staffing is proper and effective selection and appraisal and development of personnel to fill the roles designed in the structure.

This function is crucial since people differ in their intelligence, knowledge, skills, experience, physical condition, age and attitudes, and this complicates the function. Hence, management

must understand, in addition to the technical and operational competence, the sociological and psychological structure of the workforce.

2.4.1.5 Directing

The directing role relates to leadership, communication, motivation, and supervision, to enable employees to execute their set goals and their duties as efficiently and effectively as possible. The leadership component includes giving out instructions and mentoring the subordinates about procedures and methods. Communicating must be two-way traffic to ensure that information is passed on to subordinates and that necessary feedback is received from them on time. Another vital component is motivation, as it enhances excellent performance in subordinates, with them needing less direction from superiors. Continuous supervision of subordinates allows for rapid progress reports and assures proper implementation of job directives.

2.4.1.6 Controlling or Coordinating

Controlling is defined as: "the measurement and the correction of performance activities of subordinates, in order to make sure that the enterprise's objectives and plans work towards their accomplishment" (Koontz & Heinz, 2010:25). Coordinating or controlling consists of those activities that are carried out, ensuring that the events do not deviate from pre-arranged strategies. They establish standards, measure work performance, compare it to set standards and take actions to correct any deviations as and when needed.

2.4.1.7 Reporting

Reporting refers to the keeping open the channels of communication both ways, throughout an organisation and it helps in reporting the progress of work to superiors, thereby allowing them to make modifications to the plan if need be (Espy & Guy, 2017:199). Furthermore, all the vital exchanges of information on the challenges facing employees, new regulations and motivation, among others, can easily be shared with relevant parties within a limited time with fewer distortions (Abualoush *et al*., 2018:220).

2.4.1.8 Budgeting

A budget is defined as a financial, and / or a quantitative statement, prepared and approved prior to a defined period, of the policy to be pursued during a certain period, for the purpose of attaining a given objective and it may include income, expenditure and the employment of

capital (Chanter & Swallow, 2007b:221). Finance is critical to any organisation and to all resources; human, material and time; must be allocated judiciously and any responsible employee must be held accountable for its usage. A report of budget or budget variance enables management to analyse and report to the owner the success or the failure and the future of a building, in financial terms (Cloete, 2001:14). Management can also only be considered successful if the defined scope of work is achieved at the right time and within budget (Terlizzi, Meirelles & de Moraes, 2016: 472).

From the foregoing, it can be deduced that the roles of the human settlement manager include among others, maintaining a balance between organization goals and the efforts of his, team by monitoring, directing and motivating each of them to achieve organization goals. In a broader sense, the human settlement managers' work includes but is not limited to, budget development and implementation; purchasing and accounting, records management and management information systems, risk management; planning, consulting and managing investment flow, decision making and direction, leading and staffing, resource management and allocation etc. With this diversity of functions, the human settlements manager must have many competencies some of which require problem-solving and decision-making abilities, integrity, assertively, flexibility, accuracy and the ability to cope with pressure.

2.4.1.9 Human Settlements Management Approaches

"Human settlements management" is the control of its whole system, having in mind the set goals and the objectives aimed at preserving essential benefits (Banfield, 2014). In the light of this, the management method, the expertise, and the quality of choices made in the management of the human settlement by persons entrusted with the responsibilities is a significant factor for overall success (Oladokun & Ojo, 2011:305). Scarrett (2011:10) opines that there are four main methods namely: "in-house management; management by an appointed agent (outsourced); partnership management; and hierarchical division management," that could be used in the management of housing estates and adapted for human settlements.

In-house management refers to where some person or internal staff focuses solely on developing a fast-track approach to managing a housing estate (Scarrett, 2011:10). In-house management is often done to minimise the knowledge of the outsider of the activities of the organisation and to utilise the practical skills and expertise of the staff. Where an agent is appointed to advise and to manage the services needed to sustain a housing estate and the benefits arising from it, it is referred to as outsourcing or management by an appointed agent.

The advantage of this is that the agent or firm engages in a wide range of housing estate activity-related services, such that they must maintain highly skilled and expert personnel within the management team.

Regarding a partnership or the combination of in-house and outsourced / appointed agent management approaches, this refers to an arrangement between the in-house estate department and the appointed agent / firm concerned with the range of housing Estate Management tasks in an almost flawless way, in the common interests of the portfolio (Oladokun & Ojo, 2011:305). A management approach in which the in-house team directs the strategy and further restricts the appointed firms' management tasks in housing estate maintenance management is referred to as hierarchical management (Scarrett 2011:16). In this sense, it needs to provide a contract document which sets out the precise responsibilities of the firm, thereby reducing inconsistency and misunderstanding. One major concern in this regard is that the in-house Estate Management department might not have the right staff with the skills and expertise to carry out those tasks.

Banfield (2014), however, posits that each method has its own merits and demerits and that the choice of any method is dependent on the available resources and the opinion of the owner. Reviewing previous literature, Abdullah and Razak (2011:31) observed that impediments to property management were mainly handled based on the premise of management needs and strategic approach. Hanis, Trigunarsyah and Susilawati (2010:6) however, acknowledged the incorporation of identification, a needs analysis, life cycle guidance and performance measurements as essential elements into public asset management framework. To sustainably manage human settlements, apart from its characteristics and other prevailing built environment factors; the type of ownership will enhance or undermine the level of resource commitment and the risk that can be allowed. Hence, the ownership and the various systems of ownership in Nigeria and South Africa will be considered in this chapter.

2.5 Principles of Sustainable Development

As defined above and shown in Figure 2.1, the classification of sustainable development or sustainability is broken down into environmental sustainability, economic sustainability, and social sustainability. However, Dempsey *et al*., (2011:289) submitted in their study that social sustainability has its foundations in social justice, distributive justice, 'fairness in the apportionment of resources', and equality of condition and this embeds the principle of social equity within definitions of sustainable development. The elements, therefore, could be listed

as economic sustainability, environmental sustainability, and equity sustainability.

From Figure 2.1, environmental sustainability is adduced to pursue issues ranging from ecosystem reliability to biodiversity. Economic sustainability, however, focuses on growth, development, and productivity in the economy. Regarding social sustainability, it takes into account areas of cultural uniqueness; empowerment; ease of access; stability and social justice. Du Plessis, (2007:75) recommended that the fundamental component of sustainable development and management is in its capability to promote social unity and security for all who live in the built environment space. Arising from this, it shows that the social factor, the economic factor, the political factor and the environmental factor would significantly stimulate social cohesion and sustainability in human settlements. As such, he acknowledged these factors to be policy, penury, justice and ownership; environmental quality and the right to infrastructural facilities and utility as these are germane to housing and the surrounding space.
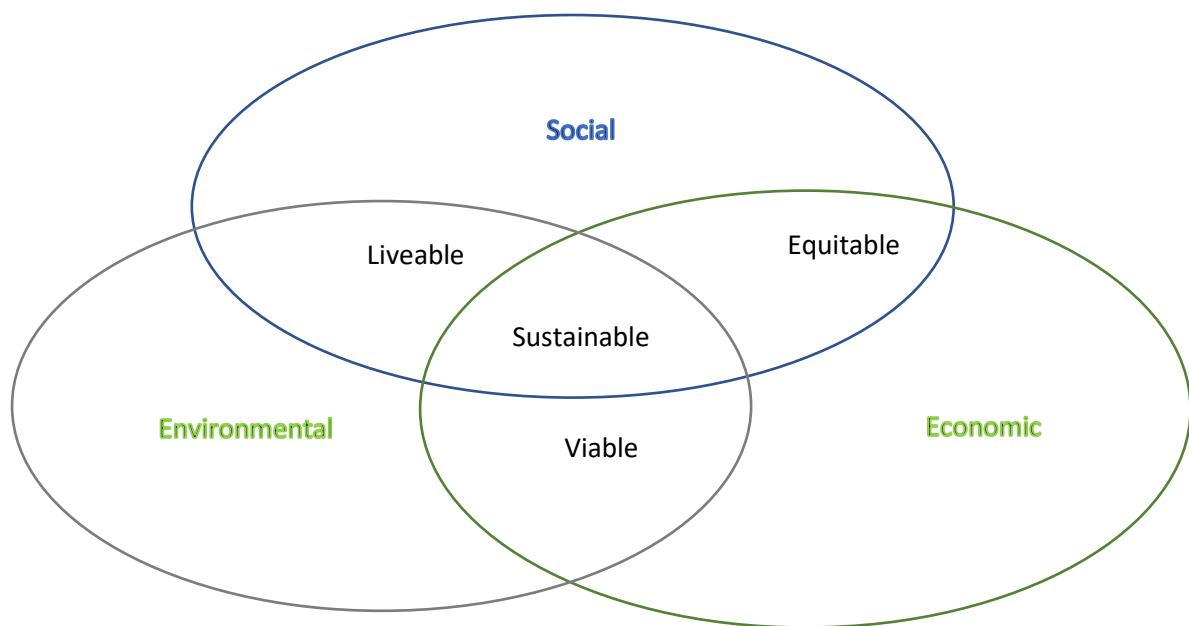
Figure 2. 2: Classic dimensions of sustainable development. (Tanguay *et al*., 2010:408)

Sustainability, when categorised by holism and entanglement, deals with the environment, the economy and human society and culture. The validity of decisions is determined based on their proximity to the common areas of the categories, as mentioned earlier (Wu *et al*., 2017:7). Thus, each of the dominant ideologies of environmental, socio-cultural and economic sustainability can guarantee some associated goals (Nemati, Bemanian & Ansari, 2017:59).

In a recent understanding of sustainability, economic sustainability is seen as dependent on the

fulfilment of social sustainability. A sustainable economy is a function of a sustainable society. Sustainable development in the brown agenda approach, holds that the sustainability of society and the economy will not be realised without a sustainable ecology (Williamson *et al.*, 2017:745).

Within the built environment, a significant factor which hampers opportunities for self-improvement is poverty, and this makes people engage in criminal activities in order to survive. By the same token, poverty has continued to be a significant challenge to sustainable development, with its attendant effects on all facets of life and to solve this, there must be a socio-economic solution.

Du Plessis, (2007:389) opined that the International Council for Research and Innovation in Building and Construction will have to come up with some innovative answers to the problem highlighted above and that living in a weak environment comes with its stigma being coupled with other social vices.

With the issue of poverty at the back of our mind, it comes to the fore that many issues are underpinning health and housing for the low-income group who comprise the bulk of the population in developing economies. Thompson (2017:235) identified the inadequacy of the accommodation of the poor in protecting them from health hazards. They posited that this inadequacy was a result of the lack of income which would otherwise have given them the chance of obtaining healthier and adequate housing with ancillary services. They concluded that be it as it may, the poor would instead continue to stay put in this poor accommodation.

With this scenario and the vision of the United Nations and every nation that is a signatory to its charter, sustainable development becomes inevitable. WCED, (1997:16) stated that sustainable development requires meeting man's basic needs and that world-ridden poverty would always be prone to natural and other ecological catastrophes. The environment which one inhabits defines one's quality of life. Factors that define this environment include pollution (water and air), sanitary systems, household size and the quality of the building. When all these factors are lacking, an environment both makes its inhabitant appear inferior and they do not want to identify with it (Du Plessis, 2007:3).

Due to the geographical location of the people in the underprivileged strata of the society, they have partial or no access at all to infrastructure, facilities and services. The partial or a complete lack of access entices the poor who are in the majority, to migrate to the cities for employment

opportunities that they may never get, because of the limitation in their educational background and technical know-how. They then end up in unhealthy built environments with bad sanitary conditions; no healthcare or recreational facilities and inadequate transport systems. However, these facilities will become a necessity for the urban poor at some point.

Besides, the principal thrust of sustainability is to encourage the availability of facilities within close proximity of residential zones, in order to abate unavailability problems. Oktay, Hoskara and Hoskara (2007:28), identified many essential factors that make housing central to the achievement of sustainable development. They listed them in terms of housing's quality, cost and availability, design and maintenance, location, planning, layout, the uses their occupants make of resources such as energy and water, and the availability of public transport / alternative forms of transport. Many residents of housing associations, however, suffer from social exclusion and can be benefit-dependent.

Since they are a crucial target group for government policies including social inclusion, eliminating child poverty, decent homes, job generation and employment addressing fuel poverty, health and education improvement; seventy (70) out of the one hundred and forty-seven (147) national sustainable development indicators, and many of the regional and local indicators, can be connected to housing and community issues. With these in mind, housing environments can hence be considered as "sustainable" if they are well planned, such that the location is in proximity to the workplace, to services, and to public transport. A housing development layout is an urban form that is a compact provision of uncluttered space network, which could serve some interlinked purposes vis-à-vis managing water, sewage, pollution controlling, nature, power, and a green belt (Dempsey, Brown & Bramley 2012:136). With energy-efficient movement network in a structured development, the travelling objectives and choices for members of the society can improve as the issue of access to public transport, would have been addressed in the planning.

Provision of networks of open spaces helps synergise and resolve issues of pollution and waste, flora and fauna and the whole gamut of the human settlement space. Cooper and Jones, (2008:362) believed that while technological solutions offer the potential for improvements in the sustainability of existing buildings, there must also be a review of people's lifestyle and behaviour in order to achieve the 2050 target. Doku (2013:40) also stressed the need for public participation to enable sustainable lifestyles by examining the influence, the commitment and the response of stakeholders in decision making and to critical environmental taxes, as

challenges that need to be addressed to achieve sustainable human settlements. Human settlements are expected to develop strategies to decide the progress achieved by sustainability principles. Although this may be difficult, it is, however, vital to make this measurement to evaluate the performance of the objectives of human settlements. The benchmark for measurement will assist in analysing relevant matters before making any decisions for the present or the future, for that development. Connolly-Boutin and Smit (2015:390) argued that the strategy adopted must be easy to understand and applied to yield the desired result. The relationship between measurement, as well as an assessment, is then vital at this point.

In the study of sustainability, assessment and measurement are concepts that align; but the procedure of each differs. Variables associated with sustainable development are classified and data is collected and analysed with technically appropriate methods in the measurement process. However, during the assessment process, performance is compared against a standard for a premeditated criterion. Assessments are practical undertakings in evaluation and decision making with expected participation by stakeholders. These exercises must be meaningful to all the parties involved (Poveda & Lipsett, 2011:37).

Poveda and Lipsett (2011:37) further revealed that achieving a meaningful assessment requires that all participants identify the underlying performance of the value system and criteria. Kamari and Kirkegaard (2019:3) mentioned a series of principles that should underscore all sustainability assessments, to achieve the maximum benefits. They argued that assessments should be "holistic, harmonious, habit-forming, helpful, hassle-free, hopeful, and humane." Gibson *et al*. (2010:165) highlights a series of sustainability requirements as decision criteria: social-ecological system integrity, livelihood sufficiency and opportunity, intergenerational equity, intergenerational equity, resource maintenance and efficiency, socio-ecological civility and democratic governance, precaution and adaptation, illustrative implications, and considerations. Gibson also explains the twelve main components of the so-called 'sustainability assessment law'. The preceding discussion gives an overview and shines light onto some critical areas of interest, but this research focuses on the management concerns that can enable integrated human settlements to be managed sustainably in Nigeria and South Africa and this becomes a focal point in subsequent sections.

2.6 Overview and the Definition of Human Settlements Management

A settlement conventionally includes shelter and all the appurtenances such as roads, enclosures, boundary lines, waterbodies, forests and any other facility that allows for the comfort of its inhabitants.

Zimmer, (2017:1) defined human settlements as: "locations where groups of people have gathered together to live in a community on either a permanent or a temporary basis." He further went on to say that the size of a settlement ranges from a handful of families to large metropolitan areas inhabited by millions of citizens. In the same vein, Van Wyk (2014:34) citing UNHabitat (1976) stated that human settlement is the entirety of human community; be it a village, a city or a town, with all the social, material, organisational, spiritual and cultural elements that sustain it. Du Plessis and Landman (2002:12) posited that the term refers to all the physical facilities and service institutions, including housing, energy, employment, transportation, communication, water, sanitation, education, health, government, law and facilities of leisure, recreation, and the arts.

In a working document, Poland and Maré, (2005:8) postulated that most communities have a mutual location which gives them something in common. Such hypothesis portends that places such as towns and cities can be communities with nothing more in common than that they share the same location. Nevertheless, they emphasised that for a community to exist, a common location is not essential because members may have something in common other than the location and this is called a geographic community (Poland & Maré, 2005:8; Zimmer, 2017:1). It can then be deduced that housing that shelters people is not only the fabric of sustainable communities, but it is also about the care of the community regarding social behaviour, health, efficiency, welfare, comfort and satisfaction, so that current and future generations can benefit continuously (Kabir & Bustani, 2012; Kadiri, 2004). However, human settlements in the context of this research encompass all forms of communities, whether private or public.

Lützkendorf and Lorenz (2005:214) asserted that the bedrock of sustainable housing starts with security, which is a universal factor in the three elements of sustainable development. It includes protection of: "the natural environment, essential natural resources human health and wellbeing, social values, public goods and the protection and the preservation of capital and material goods." Lützkendorf and Lorenzs (2005:233), concluded that the minimisation of life cycle costs, the reduction of land use and the use of hard surfaces, the reduction of raw materials and the closing of material flows should be the basis of such a classification.

They would equally consider avoidance of hazardous substances, reduction of CO_2 emissions and other pollutants, the reduction of impacts on the environment, the protection of the health and the comfort of human settlements occupants, and the preservation of human settlement cultural values. The above requirements have an affiliation to the economic, the social and the environmental requirements for achieving sustainable development of human settlement management. In housing, there exist numerous definitions of sustainability; the European Union defined it relative to the construction quality, socio-economic factors underpinning affordability and psychological impacts, and eco-efficiency: "such as the efficient use of non-renewable resources in the built environment" (Pronk, 2000). However, the sustainable management of human settlements should provide comfort, be cheap to maintain and harmonises its exclusive environment. Sustainable social housing estates should also have a housing Estate Management practice, which strives for essential quality such as including social; economic; and environmental preferences broadly. The need to incorporate the principles of the sustainability of housing, as identified by Cooper and Jones (2008:366) emphasises the provision of a good standard of living, and in applying the sustainable development concept to human settlement management, there is a need for distinction between serviceable and ecological sustainability.

For human settlement management, the focus is on functional and serviceable sustainability and not on the issue of natural resource depletion. Hence, the concept of sustainable development applies to human settlements since serviceability and functionality are vital parts of housing, which contributes to its sustainable management (Lützkendorf & Lorenz 2005:233). As perceived by the researcher and conceptualising from the definitions such as those given by Cooper and Jones (2008), Rhodes (2008), Banfield (2005), Ludendorff and Lorenz (2005), Frej and Pesier (2003), Priemus, *et al*., (1999), Stapleton (1994), RICS (1974), and Thorncroft (1965), Sustainable Human Settlement Management is described as:

> The act, art and science of coordinating, communicating, directing, forecasting, planning, supervising, monitoring and evaluating an interest which exists in a human settlement with the aim and the objective of obtaining continuous benefits or returns. The benefits could be economic, financial, social, traditional, prestigious, political, and/or other groups of benefits, which do not impede the benefits of current or future inhabitants, and it should be accessible, affordable, comfortable and safe, and tolerate all the relevant stakeholders.

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The above means that the management style to adopt would be first to merge sustainability factors, with an appropriate maintenance management method and an appropriate Estate Management approach for human settlements. After that, a right management style of coordinating, communicating, directing, forecasting, planning, supervising, monitoring and evaluating on the integrated subsets would be continuously maintained, with minimal cost, since every human settlement usually has unique features.

2.7 Factors to Human Settlements Sustainability

Urban sustainability indicators are crucial for helping with target setting, performance reviews and facilitating communication among the policymakers, the experts and the public (Sardain, Tang & Potvin 2016:547). A wide range of urban sustainability indicators is therefore in use across diverse cities and regions, and they vary consistently in their unique needs and goals (Brandon *et al*., 2017:368; Sardain, Tang & Potvin 2016:547; Yang, 2012:5). Factors such as policy often challenge the three pillars of sustainability / sustainable development in human settlements (the society, the economy, and the environment), institutional, socio-cultural, environmental, technological, fiscal, and monitoring, assessment and documentation (Brandon *et al*., 2017b:378; Van Dijk, 2008:13; Mihyeon & Amekudzi, 2005:38; Mirela-Adriana, 2014:3462; Roseland, 2000:73; Werkheiser & Piso, 2015). The inadequate selection of indicators guiding and monitoring the sustainable urbanisation process has been indicated to be the bane of attaining the desired performance (Briassoulis, 2001:420; Kates *et al*., 2005:12; Seabrook *et al*., 2006:376). Kolk & Perego (2010:193) also affirmed that the decision to adopt a sustainability assurance service is dependent on the level of awareness about sustainability present in a country.

It has also been debated that the lack of agreement on urban sustainability indicators between different practices has been causing confusion when selecting and relating them with the objectives defined or the policies applied (Hiremath *et al*., 2013:556; Holden, 2013:95; Tanguay *et al*., 2010:410, 417). Others opined that there are still no appropriate and universal methods for selecting urban sustainability indicators (Khan *et al*., 2006:98). Not clearly defined, though, policies have evolved to prove that sustainability factors assist in having a pragmatic view of issues for decision-making (Parry-Jones *et al*., 2001:38). They posited that the contentions of different kinds of literature depending on their concepts, are multi-divergent and multi-convergent.

Harvey and Reed, (2007:372) and Mutale (2017:x–xi) reasoned that: "the policy environment,

perceptions and attitudes, skills and institutions, and the selection of appropriate technology" are sustainability dynamics for any development. However, these factors must match critically the essential sustainability factors discussed above, hence sustainability elements to human settlement management would fall under the following factors namely: policy, traditional, external human settlement social perception factors, technological, environmental, fiscal, and monitoring, appraisal, and documentation. Subsequent to this and in the perspective of this research: lack of education, monitoring, information, communication, deficient capacity building, and documentation strategy (El-Gohary *et al*., 2006:601; Mok, Shen & Yang, 2014:453) arise as sub-factors.

2.7.1 Policy factors

Most countries in Africa have policies which focus on delivery and partnerships (local and international) towards eliminating the issues of housing (Turcotte & Geiser, 2017:212). These policies also had the fundamental responsibility of making housing affordable and accessible to the poor (Obi & Arif, 2015:104). As shown by Irurah and Boshoff, (2007:260), Jiboye, (2011:182), Ilesanmi (2012:19) and Gbadebo and Olanrewaju, (2015:63), there is no significant level of achievement to underscore that housing delivery and management in developing climes are both vital.

In developing countries, there is an adoption of different technologies, execution, and management strategies, and this causes disintegration and unsustainable housing, as demonstrated in most of these climes. There is a contention that the level of politics in a country is a core issue of sustainability and that the system must have a holistic commitment to housing delivery and management, or else the housing deficit will keep widening. As indicated by Holden, Linnerud and Banister, (2017:218); Holden, (2013:89); Mathenge, (2013:95); Turcotte and Geiser, (2017:112) and Smeddle-Thompson, (2012:118), it is essential to note that the formulation of policies is both dynamic and multi-dimensional and that there must be a proper structure to motivate policy implementation, adherence to policy and a proper regulatory and legislative framework and proper funding, all in the bid to achieve sustainability.

2.7.2 Social perception factors

As indicated by the World Health Organization, (1999), a community is made of a local, political and administrative group of people and their environment. Similarly, MacQueen *et al.* (2001:1929) observed that a standard definition of community emerged: "as a group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings." They posited further, however, that different participants placed varying emphasis on different elements of the definition and hence they concluded that the community was defined similarly but experienced differently by people from different backgrounds. Similarly, UNDESA (Statistics Division) and UNCHS (Habitat), 2001:13) disclosed that the term human settlement: "largely corresponds to the locality, as defined in population and housing censuses. It refers to a distinct population cluster (also designated as an inhabited place, populated centre and so on) in which the inhabitants live in neighbouring sets of living quarters that has a name or locally recognised status. It includes

fishing hamlets, mining camps, ranches, farms, market towns, villages, towns, cities and many other population clusters that meet the criteria specified above."

However, Winston & Kennedy (2019:3) asserted that social perception is often linked to discussions of housing density or intensification and as such, it comes to bear on the management and the maintenance of human settlements. Cheng (2009:37-51) classified the types of buildings that could be found in each of the density categories. The low density classification comprises detached houses and terraced bungalows, medium density comprises blocks of flats (on not more than two floors) while high density comprises condominiums and high-rise block of flats. Mixed density is a combination of blocks of flats (not more than two floors), bungalows and detached houses. Bartelt, Eyrich-Garg & Lockwood (2017:677), also stated that as housing density increases, maintenance and sustainability issues increase. The preceding suggests that factors such as demography, the economy, the environment, infrastructure and social / culture, as shown in Table 2.1 symbolises communities or human settlements.

Table 2 1: Features of a Community

Demography	Economy	Environment	Infrastructure	Social/Culture
• Age distribution and Population • Mobility • Useful skill Health • Education level • Gender Distribution	• Trade • Agriculture • Investments • Industries • Wealth	• Landforms • Geology • Waterways • Climate • Flora and Fauna	• Communication • Transportation • Services • Community assets • Government structures • Resource base	• Traditions • Ethnicity • Social values • Religions • Food and eating habits • Power structures

Adapted from World Health Organization (1999).

This brings to bear the centrality of the housing need which is primary to sustainability, such that people can only come to an understanding to voluntarily support and get involved and partake in a project, when the identified purposes and benefits are made known to them (Blackstock, Kelly & Horsey, 2006:430). The multi-dimensional and changing tradition (taste and fashion) of the community must not be underrated in the management of human settlements, as it will either make or mar the sustainability of the settlement (Ihuah & Kakulu 2014:56). They can resolve to use tradition, which might hamper the safety, the health, and the security of the settlement. Another common factor causing failure of human settlements is the rejection of perceived appropriate technology, by the community. On the issue of social values,

Gbadegesin & Ojo (2011:172), observed that outright bribery unfair practices in pricing, price discrimination, dishonest advertising, price collusion by competitors, unfairness and prejudice in hiring, cheating of customers, unfair credit practices, overselling, collusion by competitors and dishonesty in making and keeping to contracts are the most common unethical business practices prevailing in Nigeria.

Lastly, ownership is another issue as Mansuri and Rao (2004:24) and Perry-Jones, Reed & Skinner (2001:20) underscored that stimulation of a sense of ownership one of the primary necessities of community participation in project decision-making and implementation increases the project maintenance level. When the ownership right of an individual is limited (for example leasehold), the commitment to proper management and maintenance hardly ever becomes feasible.

2.7.3 Technological factors

In housing development, increased cost arising from factors such as import duties, policy formulation and implementation, an over-bloated contract and construction, a shortage of a proficient workforce added to the deficiency of local technology for building materials production are rife (Oladokun & Ojo, 2011:310; Gbadebo & Olanrewaju, 2015:59). There is a limited number of local manufacturers of building materials in developing economies. However, their quality, their quantity, and their durability are so constrained when they are available, hence making its use risky to housing (Amoako-Gyampah & Acquaah, 2008:578; McAleese & McDonald, 2009:321). However, proper monitoring for compliance with quality specifications is put in place as required, by the housing policies of most African countries, (Ogunkah & Yang, 2013:72), but there are still flaws. Regardless of these imperfections, some of the indigenous building materials are more expensive than the imported ones (Alade, Oyebade & Nzewi 2018:41). From this viewpoint, the supply of human settlement (housing) materials for the development, as well as for its maintenance, will be insufficient as most contractors may not be able to pay upfront for materials.

Regarding the availability of building materials for human settlements project maintenance, the challenges of insufficient and inadequate infrastructural facilities give rise to issues of bad roads, water, public health and the supply of power all which remain a severe problem. The challenge of the quality, availability, procurement, and supply of these infrastructural facilities accounts for this and project developers do not take into consideration the importance of these factors to the sustenance of the project in the future. Ogunkah and Yang (2013:42) argued that

the acquisition of materials for a project should be feasible and viable economically. There should be a robust connection between materials manufactured locally and the community market, to encourage a sense of belonging by the recipients of the project (Woodhouse 2006:93). The stakeholders must also be encouraged to procure such materials (Kamruzzaman, Said & Osman 2013:26). Provision of inducements such as creating an enabling environment for tax relief, the flow of funds, the low mortgage rates and the use of local materials in construction by the government, at all levels, would be an inducement. Furthermore, continuous research must be encouraged in the area of using indigenous building materials, and in so doing, there has to be a technology transfer which would afford knowledge accumulation and production, which can then be globalised (Alade, Oyebade & Nzewi 2018:41; Lizarralde & Root, 2007:2080).

Besides, Mali-Swelindawo (2016:374) identified technology as a valuable aspect of civilisation, and its dynamism creates problems, as well as new ways of resolving problems or making life better. Moreover, due to exposure to technology, human settlement obsolescence is rife as a result of a limited degree of acceptance by the users or the residents over time. This limitation is stimulated by endless enhanced technology and enrichment in setting growing prosperity benchmarks (Thomsen & Van Der Flier, 2011:35). Lambin (2012:86) concluded that even though the total quantity of land is limited, improvements in land-use efficiency and advanced technologies give access to more land resources, but it comes at an ever-increasing economic, environmental and social costs.

2.7.4 Physical and environmental factors

Environmental factors are germane to the sustainability of human settlements and they include the quality and the condition of the human settlement space; the housing design vis-à-vis aeration, illumination, and the building elements; energy consumption issues and carbon emission; natural landscape; and the complementarity of human settlements with the natural land for preservation (Ihuah & Eaton, 2014). Weather conditions is an unavoidable issue, as it results in the chemical reaction of building ingredients and other materials in prevailing atmosphere.

Mani, Varghese and Ganesh (2005:148) observed that the characteristics of the living environment, the physical features, the pattern of use and the social features determine human settlements sustainability. The topography and the hydrological processes make up the character of the living environment, while the pattern of use includes how a community will

carry on with its use of water, sanitation, industrial activities, and so on. Besides, the societal attributes of modern community life, such as social security and employment opportunities, among others, are part of the social aspect. Mohammed & Hassanain (2010:74) argued that the influence of design on operation and maintenance is more significant than ever before and that the effects of the decisions made during the design stage would have far-reaching effects on future maintainability. Similarly, Iskandar Khalid *et al*., (2019:944) reported that property managers revealed that the most significant important problem that they faced in building operation and maintenance is building design inefficiencies. All these issues require the services of trained, skilled and experienced personnel to effectively carry on the management and the maintenance work of the human settlement space.

2.7.5 Fiscal factors

A significant fraction, thirty-two percent (32%) of the total index, of a consumer's wealth is accounted for by housing or other forms of shelter, and it is the largest of the seven categories that comprise the consumer price index (CPI) market basket. Shelter's budget share increased by sixty-one percent (61%), while food's budget share fell by fifty-nine percent (59%) between 1935 and 1991 (Costa, 1998:232). One of the significant aims of Estate Management is the optimisation of returns from housing and these returns may not only be financial they could be prestige or religion or any other form of satisfaction that the inhabitant or the owner can enjoy. Therefore, this means that the fiscal policy in human settlements and its management should aim to maximise the capital value and minimise the management cost of the human settlement. The reason for this is to ensure and to enhance issues of affordability, tenure alternatives, the acquisition procedure, conformity of design with future uses and needs, as well as the creation of job opportunities in the built environment. An indication of this is that even though the cost of management may be enormous the understanding and the proficiency of reducing these costs will reinforce the affordability of housing. Bradlow *et al*., (2011:268) and Woodhouse (2006:92) confirmed by identifying housing and all that has to do with human shelter as the responsibility of government, donors or NGOs because of the capital-output involved makes them a social good. On the other hand, Welford (2016:24) expressed that they must go a step further by showing concern and commitment towards the management if such a step is to be advanced in a sustainable manner. Maintenance generally comes at an enormous cost, but when it is pre-planned (preventive maintenance) at the conceptualisation of housing, less cost would be expended in the management of human settlements.

2.7.6 Monitoring, assessment and documentation factors

The call of the UN International Implementation Scheme for the Decade (UNESCO, 2004) for the development of relevant and suitable indicators at all levels interprets monitoring and evaluation as one of the seven critical strategies for implementing the Decade (Tilbury, 2007:240). When instituted expertly, monitoring, evaluation and documentation can provide valuable information about policies, programmes, and activities to stakeholders at all levels (Lehtonen, Sébastien & Bauler 2016:2).

In both the Nigerian National Housing Policy (FMLHUD, 2012) and the South African Housing Policy and Subsidy Programmes (National Department of Human Settlements, 2010), monitoring, evaluation, and reporting are an integrated practice and strategy to provide a basis for decision-making towards the enhancement of existing programmes. It also promotes accountability and it ensures the documentation of best practices and it informs new developments (the Federal Republic of Nigeria, 1991; National Department of Human Settlements, 2010) and hence it is a vital factor in housing delivery and management. Developing monitoring and evaluation systems helps to reinforce governance in countries by refining transparency, consolidating accountability relationships, and by creating a performance culture within governments, to support better policymaking and management. (Engela & Ajam, 2010:ii).

In another vein, UN-Habitat Agenda 21 (1992: xx) requires all stakeholders to participate in the stages of conceptualisation, design, implementation, monitoring, assessing and reporting on any project. Therefore, to ensure that the management of human settlement is monitored, assessed and reported, the style adopted in its management , in housing conditions, as well as in the state of the built environment cannot be overstressed, as it is the basis whereby human settlements can meet their objectives.

2.8 Human Settlements in Nigeria and in South Africa

The two case studies have housing policies which has its roots in the colonial (Nigeria) and apartheid (South Africa) past and it makes each unique and would be discussed hereunder.

2.8.1 An Overview of the Nigerian Human Settlements (Housing) Policies

2.8.1.1 Background

The Nigerian housing policy has a history that is as old as the country itself and is distinct comprising the five distinct phases of the colonial era (pre-1960), the post-independence era (1960-1979), the second civilian government (1979-1983), the military regime (1984-1999), and the new democracy (1999 to date). The critical feature of the colonial era was the provision of quarters for expatriates and other indigenous staff of parastatals and organisations of the colonial government. It also heralded the creation of Urban Councils in 1946, the establishment of the Lagos Executive Development Board (LEBD) in 1954, the creation of the Nigerian Building Society in 1955, as well as the enactment of the Regional Housing Corporation in 1959 (Festus and Amos, 2015). The post-independence period also experienced some improvements in housing provision during the First National Development Plan period (1962-1968) and the second National Development Plan (1970-1974). The formulation of the National Council on Housing in 1971 led to further improvement in housing delivery. The third National Development Plan (1975-1980) made further improvements in housing programmes, in policies, and delivery in Nigeria.

2.8.1.2   The Nigerian National Housing Policy

Nigeria has gone through many phases in her history, and various policies were formulated and implemented in the various phases.

Pre-Independence era 1914 to 1960

This period between 1914 when the Northern and Southern protectorates around the River Niger were amalgamated to form what is known as Nigeria today and 1960 when the country gained independence from colonialism. The housing sector in Nigeria had its first known formal intervention after the Lagos "bubonic" plague pandemic of 1928, which led to the creation of the Lagos Executive Development Board (LEDB). The intervention became the foundation of public housing programmes in Nigeria (Ilesanmi, 2012:7; Aribigbola, 2008:125, 128). The policy had a focus of providing expatriate quarters and quarters for domestic staff in the railways, the navy, the police, and the army (Aribigbola, 2008:128). The construction of senior civil servant quarters in the capital city of Lagos and regional headquarters such as Kaduna, Ibadan, and Enugu as well as rent subsidies and housing loans were some of the efforts made by the government.

1960 to 1980

While the LEDB served as the tool for town planning and housing development, the Nigerian Building Society (NBS), a replica of the British mortgage system was established to allow for housing opportunities. The NBS had its funding solely from the government, and this made it moribund (Waziri & Roosli, 2013:61). Between 1975 and 1980, the government planned to provide 202,000 houses for the public, but there was a delivery of only 14.1% (Waziri & Roosli, 2013:61) of what was promised. The promulgation of Decree No. 40 of 1973 established the Federal Housing Authority (FHA), but it only began operation in 1976. One of its responsibilities was making proposals for the provision of housing and ancillary infrastructural services to the federal government and implementing those proposals when approved. For example, between 1975 and 1980 under the National Housing Programme, the Festivals of Arts and Culture (FESTAC) Town, Ipaja Town, the Amuwo Odofin Phase 1 Estate were developed in Lagos, and there was a development of low cost housing estates in the eleven state capitals. The development marked the first major federal government effort in providing affordable housing to Nigerian citizens under long-term mortgage repayment arrangements and the Nigerian Building Society metamorphosed into the Federal Mortgage Bank of Nigeria (FMBN), an engine room serving the dual functions of both primary and secondary mortgage institutions. The promulgation of the Land Use Act in 1978 aimed at guaranteeing easier access to land for development purposes. However, the Act now called CAP 202 LFN, 1990 initiated a new set of problems and as indicated by several authors, including Oyesiku (1998), Akeju (2007) and Ilesanmi (2009), the decree has been a barrier to the planned growth of Nigerian towns and cities, by making the acquisition of land more difficult. It has also slowed down economic growth and worsened the housing problem.

1980 to 1989

The 1981/82 National Housing Programme was premeditated to deliver 350 medium and high income housing units in each of the states by the FHA, as an addition to the national low income housing (known as Shagari low cost) programme embarked upon by the state government, under the supervision of the Federal Ministry of Housing and Environment (Festus & Amos, 2015:56; NHP, 2006). The government planned mass housing production proposing 40,000 housing units per annum but only 47,500 units were constructed across the nineteen (19) states of the federation including Abuja, the Federal Capital Territory between 1981 and 1985 (Ebehikhalu & Dawam, 2015:43).

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1990 to 2001

This period saw the launch of ambitious housing policy in response to the United Nations advocacy by the then military government, where the goal was for all Nigerians to have access to decent affordable housing at affordable cost before the end of the year 2000A.D. This launch birthed the slogan "Housing for all by the Year 2000 A.D" (Ebehikhalu & Dawam, 2015:43). As at the launch of the policy, the housing need in the country stood at about eight (8) million units (Onyemaechi & Samy, 2016:115). The policy preached the adequate involvement of the private sector in the infrastructural provision, and this was to serve as the primary tool for housing delivery (Aribigbola, 2008:128, 2011:124). The policy projected that 700,000 housing units, sixty percent (60%) that had to be in urban centres are to be built annually, to clear the housing deficit. The policy re-structured the accessing of housing loans by creating a two-tier financial structure, (FMBN as the apex and supervisory institutions and Primary Mortgage Institutions as primary lenders) but the FMBN conceded supervisory functions to CBN in 2007 (Aribigbola, 2011:124). The FMBN by Decree No. 82 of 1993 undertook "to collect, manage and administer contributions to the National Housing Fund (NHF) from registered individuals and companies." Anugwom (2015:3) stated that Decree No. 3 of 1992 is a "legal instrument for mandating individuals and government to pool resources into the National Housing Fund (NHF)." The policy establishing the NHF emanated from the recognition of severe housing problems, qualitative (existence of substandard housing,) and quantitative (severe housing shortages), in most of Nigeria's urban areas (Anugwom, 2015:3).

The original objectives outlined in the National Housing Policy 1980 were the main thrust of the 1992 Decree (Ibimilua & Ibitoye, 2015:56).

The objectives, as outlined, were:

a) To ensure that the provision of housing units conformed to realistic standards and that it was affordable;

b) To give priority to housing programmes designed to benefit the low-income group; and

c) To encourage every household to own its own house through the provision of credit or funding (this specific objective crystallised into the NHF).

Besides these undertakings, the 1992 policy tailored its strength in line with the enabling objective of the United Nations Commission on Human Settlements. Thus, resource mobilisation for active house ownership by workers was its central objective, and its de-

emphasised governments' intrusiveness into the housing sector. However, the NHF which was initially meant to facilitate the defunct vision of: "Housing for all by the year 2000A.D" has been long overtaken by events. Consequently, Decree No. 3 of 1992, specified that the NHF is to run under a structure that among other things, includes the provision that all Nigerian workers earning an annual income of N3,000.00 and above should contribute 2.5 per cent of their salaries to the fund. For ease of pooling funds and accessibility, the law empowers employers to remit the mandatory contributions to FMBN.

Furthermore, commercial and merchant banks were mandated by the same policy to invest ten percent (10%) of their loans and advances into the NHF, while insurance companies were expected to contribute twenty (20) and forty percent (40%) of their non-life and life funds, respectively, into real estate development.

The law also required the three tiers of government to contribute at least 2.5% of their annual revenue into the NHF. The pooling of resources from the public and the private sectors was to limit the government's direct participation in the running and the administration of the fund. Contributors were eligible to borrow any time for building purposes or withdraw their savings (including the interest) at the age of sixty (60) or on retirement.

The PMIs are authorised by the decree to bridge the gap between the FMBN and the contributors (employers and workers) by evaluating loan applications from the individual contributors and helping them to access such loans. The maximum loan allowed for a contributor was pegged at one and half a million naira and was to be jointly provided or financed by both the PMIs and the FMBN. The loans are at half or at fifty per cent (50%) of the prevailing market rate (Omirin & Nubi, 2007:53; Waziri & Roosli, 2013:64, Ebehikhalu & Abegunde, 2015:592).

There were plans in by the NHF in 1994 to deliver about 121,000 housing units, and it has achieved less than five percent (5%). The 1991 housing policy sought for active participation of all tiers of government and her agencies, as well as parastatals and they mandated them to provide sites and services schemes for all income groups, with particular emphasis on low income groups in all the major cities in the country; and to provide low income houses in all states of the federation. Towards the proper and decisive implementation of this policy, the National Housing Policy Council was established and it was saddled with the responsibility of coordinating all activities relating to the housing sector and to ensure continuous monitoring to determine its performance compared with others (Ebehikhalu & Abegunde, 2015:592).

After the "Housing for all by 2000 AD" had failed and with the new democracy, the perception of the government was that availability was not the main problem of housing, but that affordability was, but Aribigbola (2011:124) described this as a mere illusion. With the establishment of the Federal Ministry of Housing and Urban Development, a proposal for housing reform was on the front burner. Policy focus changed towards the private sector as a catalyst for housing delivery in Nigeria, while the government was to concentrate on basic infrastructure provision. Special attention and a call for a review was made for issues in the Land Use Act and the financial structure of FMBN as well as the provision of incentives to developers in the form of a tax holiday for five years (This day online, 2009; Gbadebo & Olanrewaju, 2015:58). The policy recognised the private sector as the solution to the housing deficit in the country, while the government was to function in such a way as to provide an enabling environment to facilitate the delivery of housing (Abdullahi & Wan Abd Aziz, 2017:14). With the inability of previous policies and programmes to tackle the backlog of housing problems in the country, the need arose for a more pragmatic solution, and this informed the basis for a revisit and a review of the 1991 National Housing Policy.

2002 to date

The Federal Government of Nigeria set up a fifteen-man committee on Urban Development and Housing in 2001. The chief responsibility of the committee was to articulate a new housing policy and the resultant report of the committee as accepted by the government, was published in a Government White Paper on the Report of the Presidential Committee on Urban Development and Housing in the year 2002. The new housing policy was the fulcrum of Part one of the report, and it was subsequently published as a Draft National Housing Policy in January 2004. After the draft was subjected to critique, comments and inputs from across the length and breadth of the country, the New National Housing Policy was published in 2006.

Some transitionary strategies came up with this policy-making government to partially disengage from housing provision and to encourage private developers (Aribigbola, 2011:124). Under the policy adjustment, the amortisation period which had hitherto been twenty-five (25) years was reviewed upwards to thirty (30) years, interest on NHF loans to PMI's was reduced from five percent (5%) to four percent (4%) while the lending rate to contributors fell from nine percent (9%) to six percent (6%). The new policy aimed at removing the impediments to the realisation of the housing goal of the nation.

The goal of the policy stated that: "it is to ensure that Nigerians own or have access to decent, safe and healthy housing accommodation at an affordable cost." This goal was similar to that of the 1991 policy except that its fulfilment of the policy was not time-specific. The scope of the policy objectives has also been widened to include some of the issues put under the 1991 policy strategies (Ibimilua & Ibitoye, 2015:56). The main thrust of the policy is on institutional reform, capacity building, and increased financial mobilisation to the housing sector, local building material production and adequate access to building land. The 2004 National Housing Policy (NHP) emphasised private sector participation in housing finance and investment. One of the short-term measures advanced in the policy is the commencement of the implementation of a private sector led housing construction programme. Section 3.5 specified that the role of the private sector was to include participation in the employees' housing scheme, the establishment of primary mortgage institutions and cooperating with all tiers of government in the provision of houses.

The new housing policy had nine chapters. Chapter 1 was the general introduction, including a review of the past policies and programmes. Chapter 2 had a housing policy goal, objectives, and strategies. In order to resolve the problem of inadequate access to land. In Chapter 3, was the goal of making building plots available at the right time, in the right place and at reasonable prices for people willing to build. It re-emphasised the problem of the Land Use Act of 1978 and recommended its immediate amendment.

The proposed amendment included the land use registries in local government areas and a review of the composition of the local government land allocation committee to include relevant professionals. Likewise, it had to include an amendment of the land compensation law to reflect the present-day economic value of the land, quick payment of compensation, and the provision of guidelines for fixing ground rent and separation of the land use decree from the 1999 constitution of Nigeria, among others. The policy also intended to improve the procedure for land registration using surveys and cadastral maps as a national system of compulsory land registration. Chapter 5 of the policy considered the issue of housing finance and advanced proposals for improvements. Other issues considered included building materials and construction cost in Chapter 6 and low income and rural housing in Chapter 7. It was worth noting, however, that the new housing policy meant to address the housing needs of Nigerians.

The policy emanated from the recognition of the various impediments to housing policy and programme implementation in the past and the attempt to provide proper long-lasting solutions.

The effectiveness of the policy measure was already manifested in the housing finance sector, as brought about by the recent mortgage finance reforms. However, the success of the policy depended mostly on the provision of necessary political will through the creation of an enabling environment for people to own or to have access to decent accommodation.

Ifesanya & Anthony, (2006:15-17) listed the laudable component of the policy to include:

- The government's realistic short-term intervention measure where the building of twenty thousand (20,000) housing units was targeted throughout the federation, over four (4) years at the rate of five thousand (5,000) units per annum, unlike the previous 'ambitious' target of constructing a hundred and sixty thousand (160,000) units over four (4) years.
- Clear guidelines on building materials and identifying the major causes of the escalating prices of the materials and advocating the expansion of local capabilities, positing that Nigeria should gradually and systematically develop appropriate capabilities to achieve self-sufficiency in professionalism and the production of elementary building materials and components from local resources, by the year 2015.
- A proposal of significant adjustments to the recognised lapses and weakness of the Land Use Act of 1978.
- Clear delineation of responsibilities for stakeholders involved in housing delivery, while recognising the importance of the private sector in housing delivery and only complementary roles for government. The delineation informed the projection that forty thousand (40,000) housing units would be constructed by the private sector per annum, while only five thousand (5,000) units were proposed to be provided by the government within the same period.

If efficiently implemented, the NHP (2004) was expected to enhance the capability of all Nigerians to acquire their own houses.

However, the inability of earlier policies and programmes, to effectively resolve the housing backlog in the country necessitated the need for the revised National Housing Policy 2012. the Nigerian government approved a new housing policy targeted at an annual construction of one million houses to supplement infrastructural deficit in the sector.

The Housing Policy of 2012 accentuates the central role of the private sector, while the government focusses on its regulatory role. The objectives of the policy amongst others are to:

(i) develop and sustain the political will of governments for the provision of housing;

(ii) develop an efficient land administration system to make land ownership available, accessible, secure and easily transferable at affordable price;

(iii) provide adequate and affordable housing finance to all Nigerians by developing efficient primary and secondary mortgage markets;

The embracing of Public Private Partnership (PPP) stimulated the construction of a number of low income housing schemes across the country with the government undertaking to create an enabling environment for real estate and private sector developersto do business (Muhammad, Johar, Sabri and Jonathan, 2015: 23). However, the capitalist economy in which Nigeria operates where profit is the prime motivator of any transactions brings a strong doubt whether such houses would be affordable to the low and medium income earners. Adegboye (2016: online) stated that the prices of most of the houses provided by the private developers are not affordable and the government is helpless to regulate their prices in the situation.

As revealed by the website of the Federal Housing Authority (FHA) (https://www.fha.gov.ng/), a 2 bedroom flat can be acquired for between nine million naira (N9.0m) and Twenty three million (N23.0m) and these prices are beyond the reach of the average public servant. There has also been a significant lack of clarity over what'affordable and housing needs' of the low income earners mean and for whom the housing products are intended (Abraham, 2019: 36).

However, from the literature, the general conclusions from the evaluation of the implementation of all previous and current housing policies and programs in Nigeria was that there had been poor performance and a widening and frightening gap between aspirations, expectations and capability of realisation of such policies. The extent and the complexity of the gaps had rendered the perceived successful policies worthless and this resulted in a massive gap between housing needs and demand which, in most cases, had made a mockery of existing housing policies in Nigeria.

2.8.1.3   Challenges of the Nigerian National Housing policy

The major aim of any housing policy is to solve housing problems but the challenges that are associated with the Nigerian National Housing Policy were identified by the work of authors

including Aribigbola (2008:133), Azeez and Mogaji-Allison (2017:40) and Omolabi and Adebayo (2017:801) which was described as inadequate research and studies on the formulation and the execution of the policy, the shortage of skilled personnel in the building industry, policy implementation, inadequate funding and ineffective housing finance, insufficient infrastructural amenities, rural-urban migration and the high rate of urbanization, the ineffective planning, and development of shanty towns as well as the high cost of building materials, among others. These problems are rife in both urban and rural places, and despite the high cost of land, the problem is exacerbated by bottlenecks in the processing of certificates of occupancy (C of O) as well as approval of building plans (Dukku, 2017:6) which are grounded in the policy documents.

Furthermore, Ibimilua and Ibitoye (2015:53) contended that the inability of the housing policy to address the qualitative and the quantitative housing policy in the face of the ever-increasing demand is another challenge.

The findings of Ebekozien, Abdul-Aziz and Jaafar (2019:7) likewise identified an unstable macroeconomic environment, corruption, a weak institutional framework, the lack of political will, slack policy and its enforcement, the lack of a national housing database, inadequate funding and inappropriate legislation and the lack of political will regarding a system of land tenure as central to the failures of various Nigerian housing policies, over the years. The findings of the authors above and many more who have studied the Nigerian Housing Policy give credence to the fact that the housing policy needs a general overall.

2.8.2 An Overview of South African Human Settlements Policies

2.8.2.1 Background

Before the democratic elections in 1994, the formulation of the housing policy in South Africa had commenced with the establishment of the National Housing Forum (NHF). The forum, which was a non-governmental multi-party negotiating body, that comprised nineteen (19) members from all sectors of the economy. Elaborate research and development of institutional and legal interventions was used by the Government of National Unity to formulate South Africa's housing policy (National Department of Human Settlements, Rep. of South Africa, 2010:13).

The National Housing Accord of 1994 was given the nod by stakeholders representing all spheres of life, including the international community. This accord became the foundation of

the corporate vision that moulded the fundamentals of South Africa's housing policy that continues today. (National Department of Human Settlements, Rep. of South Africa, 2010:13). In December 1994, the White Paper on Housing followed the Housing Accord, setting out the background and the framework for the national housing policy and subsequent policies, programmes, and guidelines (National Department of Human Settlements, Rep. of South Africa, 2010:13).

Also, the legislation of the Housing Act in 1997 extended the requirements listed in the White Paper on Housing, they aligned it with the South African Constitution and clarified the roles and responsibilities of the national, provincial and municipal government. It also stipulated the administrative processes for the development of a national housing policy (National Department of Human Settlements, Rep. of South Africa, 2010:13).

2.8.2.2   The National Housing Policy Framework

The housing vision of South Africa encompasses the general objective, which is to be followed by all players in the housing sector. The post-apartheid administration's housing policy began to emerge in the early 1990s, in the perspective of the Reconstruction and Development Programme (RDP) and the Growth, Employment, and Redistribution (GEAR) programme. Inasmuch as recognition of the right to housing entirely depends on the availability of funds, the understanding that housing as a necessity is the core of South Africa's housing policy (described as a social housing policy).

The National Department of Housing (2000:7), premised the National Housing Policy describing seven (7) main strategies, namely: "stabilizing the housing environment, mobilizing housing credit, providing subsidy assistance, supporting the People's Housing Process, rationalizing institutional capacity, facilitating speedy release and servicing of land and coordinating government investment in development." The policy infers that the provision of housing is not just about the physical structure but it is also vital for poverty alleviation and sustainability (Tomlinson, 2006:6–10).

The government must ensure that all of its citizens enjoy the right to housing via the creation of an enabling environment which assists institutional preparations for housing delivery; in other words, the policy should not be an impediment "to housing rights" Tomlinson (2005:28). Amongst other things, the South African housing policy lays out the government's obligation to provide housing delivery, its financial commitment as articulated in the annual national

budget, and reliable indicators of the goals to be met and the means and the time-frames for delivery (Tomlinson 2005:150).

The first shot at the housing policy announced officially in December 1994 was the National Housing Accord which was followed shortly after by the White Paper on Housing. The White Paper specifies the framework for the national housing policy, and clearly articulates that the: "Government is under a duty to take steps and create conditions which lead to an effective right to housing for all" (Cousins *et al*., 2005:3; Mchunu & Nkambule 2017:2). All the housing guidelines, policies, and programmes that followed were supposed to fall within the framework stipulated in the White Paper. Subsequently, the Housing Act 1997 (Act No. 107 of 1997) was enacted and this extended and broadened the provisions stipulated in the Housing White Paper.

The Housing Act assured that there was some degree of alignment between the national housing policy and the Constitution of South Africa (in terms of the state's broad housing commitments), and it explained the roles and the responsibilities of the three spheres of government, namely, national, provincial and municipal. Moreover, the Housing Act set out the administrative procedures for the development of the national housing policy (Homan, 2010:4).

The Housing Act (1997:4) had the vision of : "the establishment and maintenance of habitable, stable and sustainable public and private residential environments, to ensure viable households and communities in areas allowing convenient access to economic opportunities, and to health, educational and social amenities, in which all citizens and permanent residents of the Republic, will, on a progressive basis, have access to permanent residential structures with secure tenure, ensuring internal and external privacy and providing adequate protection against the elements, potable water, adequate sanitary facilities and domestic energy supply".

The vision included a broad concept of human settlements with the housing goal expressed in terms of the delivery of houses with a view "to increase housing delivery on a sustainable basis to a peak level of 350 000 units per annum until the housing backlog is overcome" (Thwala, 2010:12).

In order to achieve this, the National Department of Housing (2004) recommended low-cost housing by activating credit for beneficiaries and builders through the National Housing Finance Corporation (NHFC) and the National Urban Reconstruction and Housing Agency (NURCHA). The NHFC provides all-inclusive capital for intermediaries lending to the target

group, and NURCHA provides guarantees for the housing development sector, to ensure access to capital (National Department of Human Settlements, Rep. of South Africa, 2010:22). To fulfil the mandate, the National Home Builders Registration Council (NHBRC) administers a warranty scheme that sets standards for the construction of low-income housing (National Department of Human Settlements, Rep. of South Africa, 2010:22).

A key component of the housing programme was to guarantee secured tenure and that beneficiaries receive freehold tenure with their new home, although rental and communal tenure is encouraged as provided through social housing options. The Extension of Security of Tenure Act (ESTA) protects people who dwell in the rural or peri-urban locations with the consent of the landowner or his agent, while the Prevention of Illegal Eviction and Unlawful Occupation of Land Act (PIE) legislates illegal evictions and occupation in urban areas (National Department of Human Settlements, Rep. of South Africa, 2010:22).

From the preceding provisions, the formulation of the National Housing Policy falls within a framework set out in certain documents, the chief of which is the South African Constitution. The Housing Act and the White Paper are necessary pieces of the machinery, forming the fundamental background for the National Housing Policy. Other vital documents that gave guidance to housing policy are the Reconstruction and Development Programme (RDP), Growth, Employment and Redistribution Strategy (GEAR), Urban and Rural Development Frameworks, and lastly, White Papers and policy frameworks pertaining to local governments and the Public Service (National Department of Human Settlements, Rep. of South Africa, 2010:22).

A variety of subsidy machinery is available such as individual, project-linked, consolidation, institutional, relocation assistance and the rural subsidies (National Department of Human Settlements, Rep. of South Africa, 2010:22). The individual subsidy which can only be enjoyed by a beneficiary once, is for low-income households who desire to acquire residential property for the first time, and it can be used to acquire an existing house, inclusive of its appurtenances. The allocation of Housing Subsidy Fund was to assist developers in the case of project-linked subsidies, to enable them to commence the building of approved housing projects and subsequently to sell them to qualified beneficiaries.

Ultimately, this was for the benefit of the approved individual beneficiaries (National Department of Human Settlements, Rep. of South Africa, 2010:22). Consideration was for projects that addressed the housing need of the disadvantaged populace, and thus, new housing

developments were encouraged, to be geared at achieving the essential points of departure of the Housing Policy and Strategy.

For the people who had previously received a subsidy and who lived on a serviced site but desired to build a better house (for example, building a top structure), the consolidation subsidy was made available. Non-profit organisations (NPOs) like churches, local authorities or housing associations (also called "social housing institutions") that wanted to provide rented accommodation to people from lower-income groups are catered for by institutional subsidies. The rationale for the name came from the activities of institutions that provide rental accommodation to various families, and this type of accommodation does not jeopardise the chance of the family to apply for their subsidy later. The relocation subsidy, on the other hand, is for homeowners locked into paying for a mortgage from an accredited lender and the borrower who cannot afford to meet their mortgage obligations.

A person who qualifies for this loan must have defaulted at least three times and must enter into a relocation agreement for more affordable housing. The last type of subsidy is the rural subsidy, and this is available to people who do not have formal tenure rights to the land on which they live, that is that such land is owned by the government and the tenure is granted in terms of traditional laws and customs. The rural subsidy is available only on a project basis and beneficiaries themselves may decide how to use their subsidies. The use of the subsidy may be for building houses, providing services or a combination of both (National Department of Human Settlements, Rep. of South Africa, 2010:22).

Another strategy is that of supporting the People's Housing Process (PHP), and it offers support, training, and technology to families who own undeveloped, serviced property and who want to apply for a housing subsidy to build their own homes (Lizarralde & Root, 2007:2069). By sweat labour and communal efforts, as divergent to paying other persons to build their home, families could use their housing subsidy and personal contributions to build bigger or better houses for less money, because they were thereby able to buy more building materials. Houses built through the PHP are larger (36m²) than those built by the Council (30m²) (Zonke, 2015:5). It is noteworthy that the PHP is an agreement to contribute to labour and to pool resources held by groups of people who, though they qualify for housing subsidies, want to make the most of their subsidies (Smith, 2007:5).

With the dissatisfaction of the quality and the suitability of subsidised housing growing, there is an increasing emphasis on the PHP, because of the likelihood that such beneficiaries can

realise various objectives, principally in the light of reduced hopes of delivery of completed houses and which allows beneficiary households to add more savings or labour to their building projects. It is also intended to compensate for the declining real value of the subsidy by eliminating profit and most labour costs from the housing construction process; assisting in the release of serviced land before housing delivery and stem the growing rush of land invasions. "It remains to be seen whether the provinces and the local authorities will apply this policy successfully, taking into account the politicians' drive to speed up delivery of houses and the technocrats' wish to manage the process and form of urban development" (Khan & Khan, 2012:23). The importance of People's Housing Initiatives is emphasised in its valuable contribution to the housing project.

Social housing is another option to meet the housing need of the populace. The National Department of Human Settlements, Rep. of South Africa, (2010:22) defined social housing as: "A housing option for low-to-medium income persons provided by housing institutions, and that excludes immediate individual ownership." Social housing is available to secured income earners who are expected to be able to afford rentals. Social housing excludes direct individual ownership by the residents but primarily covers the rental tenure option (National Department of Human Settlements, Rep. of South Africa, 2010:22).

Hence, this shows that the social housing option is not for beneficiaries seeking direct individual ownership but rather for people who assent to the option of collective ownership. In the long-term, the conversion of these rental schemes and that of the Social Housing Institution (SHI) into ownership may, however, become viable, but only after the first ten (10) to fifteen (15) years (National Department of Human Settlements, Rep. of South Africa, 2010:22) and feasibility studies.

2.8.2.3 Challenges of the South African housing policy

Historically, South Africa just like any other sub-Saharan African countries have had their post-colonial and post-apartheid housing policies influenced by international donors and organizations that have given them support or aid (Tomlinson, 2007:v). Nevertheless, these policies have had a relatively small impact in practice, hence contributing minimally to housing delivery but not structurally changing the enabling environment; thus resulting in massive housing backlogs (Bradlow, Bolnick & Shearing, 2011:270; Turok, 2016:10).

The supply-driven housing programmes in countries such as Angola, Ethiopia, Namibia and South Africa among others, constitutes a response to these backlogs. The governments of these nations prefer mass scale direct housing delivery, but the local discourse around housing policies and their formulation still emanates from a global enabling housing policy, hence, there is a gap (Stren, 2019:36) .

The housing gap evidenced by the shortage of formal low-cost housing in South Africa, as well as the challenging living conditions in which many poor South Africans exist, which prompted a broad and vigorous debate by authors like Ballard & Rubin (2017); Charlton & Kihato (2006); Myeni & Mvuyana (2015); Oldfield & Greyling (2015) and Pillay, Tomlinson & Toit (2006), among others, about the post-apartheid housing crisis. The debates have been centred around policies, speed and the scale of housing delivery and the "geographies" of the development of South African state-funded public housing.

Huchzermeyer (2010:129) contended that a democratic regime that declared quality living has a responsibility beyond housing as a shelter and an asset but additionally, should be a symbol and an important material aspect of citizenship and belonging, with access to and partaking of what a city has to offer.

Ngwenya (2016:103) identified access to land as the major challenge affecting housing delivery, and Marutlulle (2019:3-4) in the same vein, observed factors such as housing shortage, population growth, the unavailability of land, housing distribution, corruption, unaffordability and poverty as impeding housing policies. Meanwhile, Croese, Cirolia & Graham (2016:241) argued although it was difficult to draw final conclusions on the policies and programmes, as they are implemented differently and they are still ongoing, citizens all experience maintenance, management and affordability-related problems.

Furthermore, UN-Habitat (2013, 2015) has also come to acknowledge that previous policies have not tackled the housing challenge effectively and that there is a need for government to reassume a leadership role in housing provision. The upcoming discussions on housing at the World Urban Forum 2019 will therefore certainly be of benefit to African governments towards shelter policies that are in touch with local realities.

2.9 Policy, Objectives and the Types of Human Settlement Maintenance Management

2.9.1 Human settlement maintenance policy and objectives

The maintenance of human settlements is not just about the physical structure of the shelter alone. It includes the shelter itself; the occupants or the users as well as the reason for its creation. Without this basis, the aims, the objectives, and the benefits of the conception of human settlements is limited. Maintenance hence has a significant impact on the reliability and the security of buildings (Abdul Lateef, Khamidi & Idrus, 2010:79) so there is a requirement for coherent policies for maintaining all amenities in the best possible way (Buys & Nkado, 2006:997). However, to meet its overall purpose, a maintenance policy is mandatory. It is the instrument that develops and guarantees proper planning for a human settlement. Adenuga, Olufowobi and Raheem (2010:93) stated that the avoidance of maintenance tasks is deliberate as they are believed to be a waste of limited resources. The consequences of this are not evident immediately, and as a result, management groups continue to cut down on maintenance budgets (McDuling, Harok & Cloete, 2004:2).

The United Nations (UN) Centre for Human Settlements discovered that many developing nations lack efficient maintenance management systems for the proficient utilisation of the limited available resources (Adenuga, Olufowobi & Raheem 2010:94).

Bowazi and Buys, (2012:681) also perceived that these nations lack adequate maintenance policies to monitor the maintenance procedures of their built environments and Cloete, (2002:1) also stated that when there is a claim for the availability of such policies on current conditions and for maintenance requirements, the available information is incorrect and undependable.

Olatubara and Adegoke (2007:394) listed seven (7) purposes / objectives of maintenance work as:

- The preservation of a building structure in its initial state as much as possible, to enable it to achieve its original goal;
- To maintain acceptable structural quality standards;
- To retain or to preserve the value of the investment;
- To prolong the lifespan of the building and its appurtenances;
- To upgrade the quality and the standard of the building;

- To attract higher rental values; and
- To maintain and retain aesthetic value.

Although all the above talk of the building structure, they equally apply to the housing environment, the facilities, the services, and the equipment. For the achievement of maintenance goals, a maintenance policy which supports the objectives is required. The policy is a tool towards boosting and guaranteeing the apt planning of a maintenance strategy in human settlements. The Department of Housing and Public Works, (2017:2) as shown in Figure 2.3 sets-up a generic process that can assist in establishing the appropriate practices for maintenance, and this confirmed the work of Lee and Scott (2009:270).
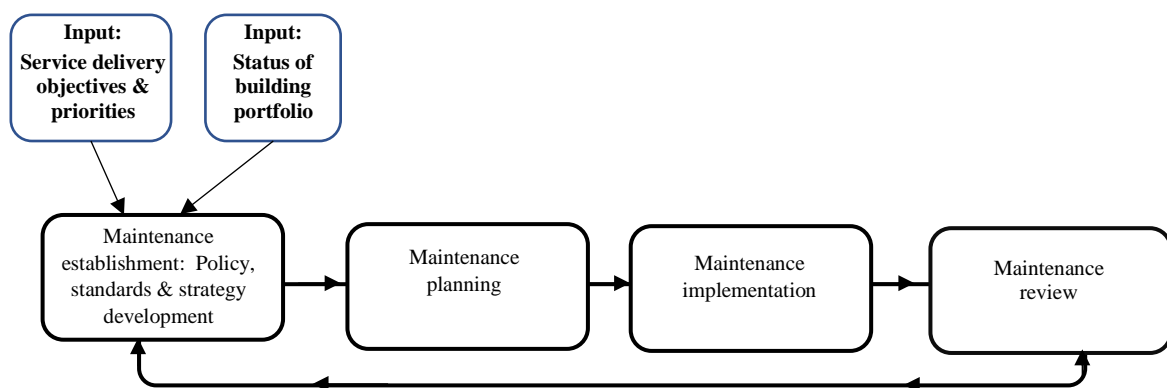
Figure 2. 3: Maintenance management process (Adapted from DHPW, (2017) State of Queensland

There are always obstacles when agreeing to and accepting the best approach for successful maintenance by any organisation (Lee & Scott, 2009:270), and this may be due to the different types of managerial decisions taken or the fact that there is a limited understanding of the assessment of the relationship between management and maintenance objectives and the aims and the objectives of the organisation.

In other words, in the development of a maintenance policy, fundamental issues such as management and maintenance objectives; anticipated benefits and the reasons for significant maintenance (Velmurugan & Dhingra 2015:1630). Hence, the rationale behind the maintenance policy is to make sure that there is an alignment between maintenance methods, standards and resources and that the principal aim for the policy is established and acknowledged before being put into operation.

The maintenance policy must not be ambiguous or cloudy, but it must be clear as to the

approach to be utilised in the use, protection and preservation of the built environment. The basis of the framework of maintenance and management operations must be well defined and the parameters for acceptable benchmarks for standards (technical, health, safety, civil and legal, fiscal) and the implementation and the control of maintenance and the servicing procedures are to be set.

Housing, is an essential part of the fabric of the human existence, it is both costly and valuable and must, therefore, be well taken care of because the consequences could result in huge costs for fixing the services and the built environment while the organisation's reputation may be damaged. A well-maintained environment is vital for the wellbeing and for the productivity of its users. The outlook of human settlements maintenance management should be that it is a vital element in fostering the objectives of the organisation and other stakeholders and it must be periodically reviewed. The management and the maintenance team should be kept in the loop so that they can put a suitable standard of funding and method in place as it is necessary to guarantee the meeting of maintenance policy objectives.

On the contrary, a lack of a proper maintenance policy can lead to the lack of direction in human settlement goals and financing, and this may be regarded as misdirected effort, a lack of clear direction, negligence and misappropriation of resources (RICS, 2012). The effect of this is an undue interruption of an inhabitants' right of enjoyment, threats to health and safety, obsolescence (physical, economic and aesthetics among other things), and a decline in value. A maintenance policy is a critical requirement for the realisation of a well-managed human settlement. Such policy will become the handbook for the management of all the stakeholders in the human settlement space.

2.9.2 Human settlement maintenance types / approaches

For human settlement maintenance management strategies, diverse categories of maintenance methods are available. The choice of the method to be used rests mainly on the shoulders of the manager and his choice must align with set policies to realise the initial goal, the objectives, and the benefits of the human settlement. However, this is also dependent on the nature and the characteristics of the human settlement, as well as the resources available for the task.

The common factors which impede the choice of a maintenance management policy are values, quality, fitness for use, health and safety and law (Lee & Scott, 2009:270). A clear understanding of these policies and objectives will prevent undue influence by these factors in

determining the best approach. It is important to note that no one format can fit all maintenance management circumstances but rather that any format adopted should be customised to the explicit requirements and programme of a human settlement. There are various approaches to maintenance, and BS3811 (1993) stated that these could be categorised into planned and unplanned maintenance, as shown in Figure 2.4.

a) **Planned maintenance**

Planned maintenance also called preventive maintenance this is the maintenance work carried out at some predetermined time to prevent or to reduce the probability of the failure of a facility (Olatubara & Adegoke, 2007:399). In this type of maintenance, applicable tasks must be set, based on safety and cost-effectiveness (Márquez *et al*., 2009:672).

Such preventative maintenance can be of two types:

- Maintenance scheduled and executed in anticipation of a breakdown which includes regular inspection, cleaning, testing, and routine checks to pre-empt component breakdown (Olatubara & Adegoke, 2007:399).
- The condition or the time based maintenance which arises from pre-knowledge of the condition of a component, resulting from periodic inspection (Overeen, 2012:7; Olatubara & Adegoke, 2007:399).

Hemmerdinger (2014:5) indicated that the benefits of preventive maintenance includes keeping the assets up and running for a longer lifespan than other maintenance types, while keeping long-term repair costs significantly low and enhancing safety, due to a reduction in the likelihood of catastrophic failure. He suggested however that the system is more complex than other maintenance systems as there is no ranking of the importance of maintenance activities and this system requires huge initial capital investment.

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                    ┌─────────────────┐
                    │   Maintenance   │
                    └────────┬────────┘
          ┌──────────────────┴──────────────────────┐
┌─────────────────────┐                    ┌─────────────────┐
│ Planned Maintenance │                    │    Unplanned    │
└──────────┬──────────┘                    │   Maintenance   │
           │                               └─────────────────┘
┌─────────────────────┐
│     Preventive      │
│     Maintenance     │
└──────────┬──────────┘
     ┌─────┴───────────────────┐                    │
┌──────────┐   ┌─────────────────────┐   ┌─────────────────┐
│ Schedule │   │ Condition / Time Based │   │   Corrective    │
│Maintenance│  │     Maintenance      │   │    Emergency    │
└──────────┘   └─────────────────────┘   │   Maintenance   │
                                         └─────────────────┘
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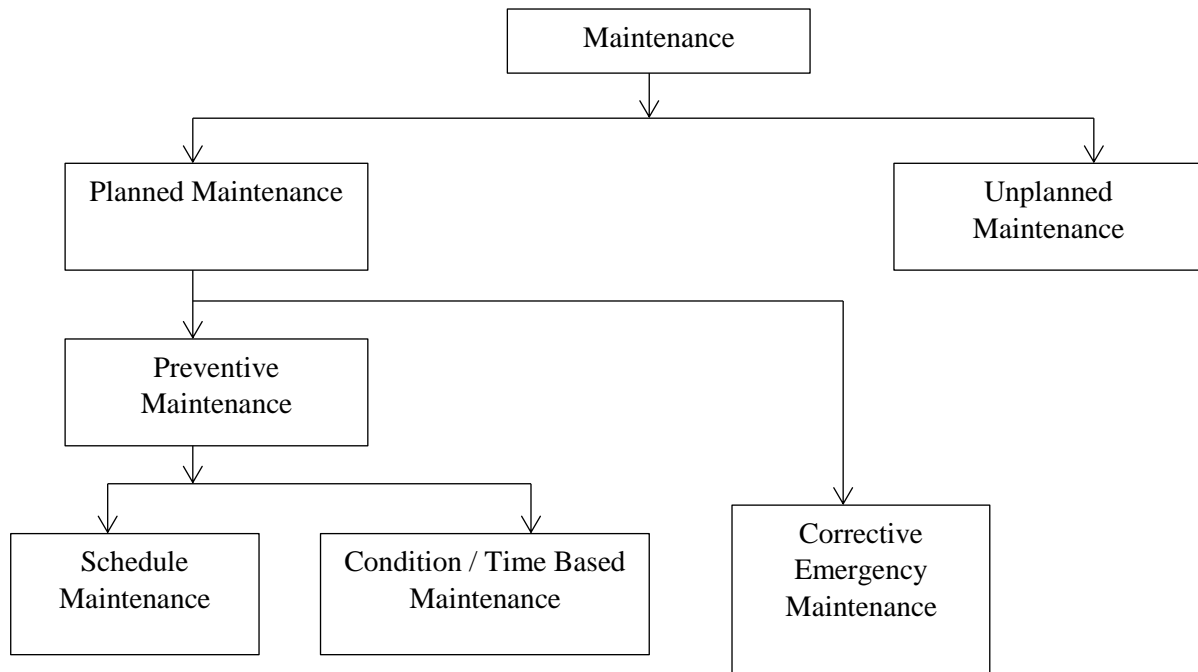
Figure 2.4: Types of Maintenance adapted from BS 3811(1993)

b) **Unplanned maintenance**

Unlike preventative maintenance, execution of this type of maintenance activity takes place after a failure has occurred and in order to restore the component to its operational or acceptable standard (Pintelon & Parodi-Herz, 2008:27; Olatubara & Adegoke, 2007:399). The damage usually results from an unanticipated breakdown, due to internal or external forces. The work required mainly comprises repairs or replacements (Pintelon & Parodi-Herz, 2008:27). The perceived benefits of this approach are twofold; in the short-term, it might seem to cost less and secondly; it requires minimal staff (Hemmerdinger, 2014:5). The shortcomings, however, outweigh the benefits, due to the cost incurred as a result of the unplanned interruption of equipment. Labour cost is increased if overtime is needed, repair cost is added to the overhead, and there is a possibility of secondary equipment or process damage due to equipment failure as well as inefficient use of staff resources due to the "fireman's idea" approach (Hemmerdinger, 2014:5).

Be it as it may, Chanter and Swallow (2007:197) stated that there would always be planned and unplanned work within any organisation. He, posited, however that the balance between these would vary, depending on the nature and the attitude of the organisation towards maintenance and that the objective of the organisation would be an optimum balance between planned and unplanned work. He also argued that a low level of planned maintenance in an

organisation does not automatically reflect a poor attitude, as it may be appropriate for the given situation.

Ali, Kamaruzzaman, Sulaiman and Peng (2010:291) analysed the relative pros and cons of corrective, preventive and condition-based strategies and they advocated a novel, systematic approach to the management of building maintenance. They suggested that this method will help maintenance engineers and managers to reduce the cost of maintenance, while preserving the safety, health and satisfaction of the user.

Akinsola (2012:13) identified the factors influencing maintenance programmes for buildings as personnel issues, physical issues, bureaucracy and economic / funding issues, among others. Adenuga, Olufowobi and Raheem, (2010:93) also observed that the lack of maintenance policy and inappropriate management methods contribute to the maintenance condition of the housing. Obsolescence, wear and tear due to age, are also identified as factors that reducing the natural corollary of human settlements with time, and it is inevitable for it to require more maintenance with increasing age (Thomsen & Van Der Flier 2011:354).

2.10 Land Ownership Systems in Nigeria and in South Africa

2.10.1 Land ownership systems in Nigeria

The Land Use Act (now Cap 202, LFN 1990) was initially promulgated as a decree in 1978 and annexed to the 1979 constitution during the twilight of the military government handing over to a democratically elected government and it is perhaps, as of today, the most controversial legislation in the country (Ako, 2017:293). The Act was promulgated to nationalise all lands in the nation; allegedly as a result of increasing difficulty experienced by private and government institutions in acquiring land for development. The Third National Development Plan noted that the difficulties experienced in land acquisition for development purposes were partly responsible for the failure to implement the Second National Development Plan (1970–74) (Ako, 2017:294). The thrust of the Act was to extend the northern system of land management to the whole country, as a means of ensuring greater ease of access to land for government and, ostensibly, for individuals (Mabogunje, 2007:5). The Act, which is the most critical act concerning land development and ownership rights in Nigeria, had some significant effects on the whole gamut of human settlements.

The cardinal principles of the Act are:

i. All land situated in the territory of each state in the country is vested in the Governor of the state (CAP. 202. LFN, 1990, S.1).

ii. All land control and management, including land allocation in urban areas, comes under the Governor of each state, while land located in rural areas becomes the responsibility of the various local governments; (CAP. 202. LFN, 1990, S2.1).

iii. All land in urban areas is to be administered by a body known as the Land Use and Allocation Committee, which has the responsibility of advising the Governor on the management of urban land; similarly, a Land Allocation Advisory Committee is provided to advise local governments in like manner; (CAP. 202. LFN, 1990, S2.3).

iv. All land which has already been developed remains the possession of the person in whom it was vested before the Act became effective;

v. The Governor is empowered to grant a statutory certificate of occupancy (C of O) which would be for a definite term (maximum of 99 years) to any person, for all purposes and rights of access to land under his control; (CAP. 202. LFN, 1990, S8).

vi. The maximum area of undeveloped land that any person could hold in any one urban area in a state, is one half of a hectare. In the rural areas this must not exceed 500 hectares except with the permission of the governor; (CAP. 202. LFN, 1990, S12).

vii. The consent of the Governor must be secured for the transfer of a statutory right of occupancy through either mortgage or assignment. While the consent of the Local government chairman or that of the Governor in appropriate cases must also be obtained for the transfer of the customary right of occupancy; (CAP. 202. LFN, 1990 S21).

viii. The Governor has the power to revoke a right of occupancy for overriding public interest, as spelt out in the Act and pay compensation as provided for. (CAP. 202. LFN, 1990 S21).

Arising from these significant provisions, the highest right or ownership a citizen can have in the land is subject to a right of occupancy and the bureaucratic bottleneck in its acquisition serves as a significant challenge in the provision of human settlement and housing delivery. Mabogunje, (2007:24) posits that for a country endeavouring to be one of the twenty largest economies in the world by the year 2020, the situation concerning property rights and transactions in land still leaves much to be desired. It is also worthy of note that whatever

ownership one has in the land, it is still merely a lease on the land as an absolute term of ninety-nine (99) years maximum is given to beneficiaries.

An effort was made to revisit the Act by setting up a Presidential Technical Committee for Land Reform in 2007 and the committee headed by Mabogunje only restricted its recommendation to the requirement of consent to assignments and alienation to be granted by the Governor, rather than a total overhaul of the Act as agitated for by the people (FMLHUD, 2012). If any review is to be done, Ako, (2017:303) believes that the removal of the act from the constitution is vital and Oladapo and Olotuah (2008:337) agreed but insisted that the new policy must give ample chance for community participation in the delivery of the land. They concluded that governments, including that of Nigeria, must identify that sustainable development needs significant changes in conduct at all levels and as such, any new policy ought to reflect the desires of the entire nation, so that the entire structure can work to the advantage of all.

2.10.2 Land ownership systems in South Africa

The defunct Native Lands Act of 1913 through a complex process of colonialization and land dispossession confined the indigenous people to reserves and it legally appropriated more than ninety percent (90%) of the land to their colonial masters (Ntsebeza & Hall, 2007:108). The Land Laws of 1936, despite the increasing size of land available for Africans did not ease the acute shortage experienced and this made the indigenous people turn from farming to becoming poorly paid wage labourers in the mines (Ntsebeza & Hall, 2007:109). With the heavy yoke of apartheid came stiff resistance evidenced by strikes in Durban in the early 1970s and as it spread, through the country, a few years after the student uprising in Soweto which fuelled political and economic opposition to apartheid. By the 1980s, many commentators concluded that South Africa was in a state of "organic crisis" (Aigbavboa, 2016:4) and the future of what South Africa would look like emerged at that time (Ntsebeza & Hall, 2007:110).

The African National Congress' (ANCs) Bill of Rights as included in the SAConstituton (https://www.justice.gov.za/legislation/constitution/SAConstitution-web-eng-02.pdf) for a New South Africa unequivocally stated in Article 12 (1 & 2) that:

> "The land, the waters and the sky and all the natural assets which they contain, are the common heritage of the people of South Africa who are equally entitled to their enjoyment and responsible for their conservation. The system of property

rights in relation to land shall take into account that it is the country's primary asset, the basis of life's necessities, and a finite resource."

Article 13 (1 - 8) of the same bill states:

> All South Africans shall, without discrimination, have the right to undisturbed enjoyment of their personal possessions, and, individually, in association or through lawfully constituted bodies, be entitled to acquire, hold or dispose of property. The content and limits of these rights and the rights to inheritance shall be determined by law. Property rights impose obligations, and their exercise should not be in conflict with the public interest. The taking of property shall only be permissible according to law and in the public interest, which shall include the achievement of the objectives of the Constitution. Any such taking shall be subject to just compensation which shall be determined by establishing an equitable balance between the public interest and the interest of those affected. In the case of a dispute regarding compensation, provision shall be made for recourse to a special independent tribunal, with an appeal to the Courts. Legislation on economic matters shall be guided by the principle of encouraging collaboration between the public, private, co-operative, communal and small-scale family sectors with a view to reducing inequality, promoting growth and providing goods and services for the whole population. The above provisions shall not be interpreted as impeeding legislation such as might be deemed necessary in a democratic society with a mixed economy which may be adopted with a view to providing for the regulation or control of property or for its use or acquisition by public or parastatal authorities in accordance with the general interest, or which is aimed at preserving the environment, regulating or curtailing cartels or monopolies or securing the payment of taxes or other contributions or penalties.

All these posited that the ANCs position was not opposed to the inclusion of a property clause in the constitution, but Tong (2014:25) argued that it was not devised to protect the title of the existing owner but rather to facilitate a legislative programme of land restoration and rural restructuring.

Section 25 of the Constitution highlights property rights, and its provisions are as follows:

No one can have their property taken away from them unless this is done according to law.

The government can take a person's land away from them if:

It needs the land for public purposes, or

It is in the public's interest, for example, if the government needs the land for its land reform programme. If the government takes land from a person, they must pay the person compensation. There are certain things to think about when a landowner and the government are deciding how much compensation to pay for the land. These are: the history of how the property was bought and what it was used for before; how much the owner has improved the property; what the property is being used for now; the market value: what the price of the property would be if a private person or business bought it; how much the government can pay: how much money the government has in its budget to pay for the property; what the government wants to do with the property."

S25 of the Constitution of RSA

Mutangadura, (2003:3) also revealed that the last three decades had seen several land reforms in Southern Africa, some of which were aimed at land redistribution and introducing land titling for customary tenure. He opined that adequate attention had not been paid to the issue of land tenure reform, but there is a growing recognition of the centrality of land tenure in the sustainable development process in the region, as witnessed by some regional and national initiatives and meetings.

Mayende, (2004) in his statistical data about land ownership in South Africa asserts that at most, eighty percent (80%) of the agricultural land in the country remains in the hands of about forty-five thousand (45 000) white industrial farmers, who own pieces of land with an average size of 1 300 hectares (ha), while in the communal areas five (5) million households only have access to fifteen (15) million hectares, with an average size of 1.5 hectares. In challenging Mayende (2004), Pieter Mulder in a report compiled by Cronje (2012) observed that the Republic of South Africa has a total area of one hundred and twenty-two (122) million hectares and that as of March 2011, thirty-one (31) million hectares or twenty-five percent (25%) of the surface area was in the hands of the state. The remaining ninety-one (91) million hectares or seventy-five percent (75%) of the surface area is privately owned, and this shows the extent of land ownership in South Africa. Besides, Lategan (2017:55) reported that a total of sixty

74

percent (60%) of South Africans who were living in rural areas are characterised by abject poverty, unemployment, weak institutions and gross inequality.

2.11 Summary of the Chapter

This chapter reveals that mass housing delivery and human settlement is viewed as an end to solve the housing need of the poor and to resolve the housing deficits in developing countries such as Nigeria and South Africa. The discourse showed the significance and the necessity of sustainability in the human settlement and housing delivery and it showed that there is no provision and strategy for post-occupation of the life of the human settlement. Where and when they exist, they do not incorporate sustainability factors which in a real sense, are indispensable, and this underscores that management and maintenance, along with other appropriate concepts, viewed in the study, are germane to the sustainability of the benefits of projects in the built environment. The literature also showed different methods of Estate Management and maintenance that can be employed in human settlement management. Integration of effective utilisation of sustainability factors, Estate Management and maintenance principles is encouraged. The chapter emphasised that integration could pave the way for the rectification of the imperfect human settlement situation, remedy its shortfalls and aid with the improvement and the achievement of sustainability. The study is motivated to investigate the research questions in the previous chapter to pursue the study objectives and to achieve the research aim of developing a new model for the management of human settlements. Therefore, since the literature findings above were acknowledged and considered by the study to be primarily social concerns, the next chapter presents the conceptual framework of the study, and thus, it will provide the bedrock for the research methodology.

CHAPTER 3: THEORETICAL FRAMEWORK

3.1 Introduction

A review of the related literature was presented in Chapter 2 to explain the nitty-gritty of the management of human settlements, within the context of Estate Management from a global perspective. However, there are an increasing number of approaches used in social sciences research, but this study is motivated by an understanding of research problems from multi-disciplinary perceptions by associating such problems to theories developed in other disciplines (Frodeman, 2011:108). In the research studies, the theories used are the results of established ideologies concerning the type and the reliability of proven occurrences of events, as a result of careful observations, assessment of facts, postulations, and hypotheses. The evolving theory provides explanations for a phenomenon (Coviello, 2005:44). Ifesanya (2012:13) affirmed that the term 'Theory' has been continuously associated with 'passionate thoughtful contemplation' of the 'why' and the 'how' of human experiences. It is a standard set of notions that are intended to describe occurrences in human societies or a traditional set of ideologies. Theories, thus, gives a skeleton / structure for fleshing up studies in fields of human enterprise. Creating a theoretical framework for research exposes the association and the blueprint that guides expectations as well as perceptions about a phenomenon. Consequently, it is necessary to examine existing theories and the chapter will discuss all the variables identified in the conceptualised model, as well as additional and supplementary literature. It will further underscore and support the definitions of the variables demonstrated in the model, to test it, empirically.

3.2 Requirements for a Successful Human Settlement

The literature reveals several elements that contribute to 'successful human settlement (real estate)'. The elements are not restricted to governance and authority but include robust and effective communication structure and strategy formulation, in diverse angles of property management. Hence, the guarantee of robust strategies by leadership is vital for issues bordering on service quality, global alignment, sustainability, transformation, industry competence, sustainable properties and urban renewal. Furthermore, sustainability concerns have a significant association with environmental management (Esfahbodi, Zhang & Watson 2016: 350). Consequently, environment management is vital to human settlement management,

and they all require proper finance and cost control, which should be measured, monitored and controlled by undergoing a measurement analysis as well as risk and performance management.

The element of leadership requires personnel who can offer a proficient vision for human settlement, encourage vibrant development of civil society, while building partnerships of common interest and capacity, through local leadership for the improvement of diverse groups of people, towards shared goals (Uddin 2017:92). With the diversity of interest, thoughts and ideologies in local communities, leadership should continuously develop its capacity to make policy decisions that can build coalitions and partnerships and be transparent and accountable, while representing a diversity of interests and demonstrating value for money. Urbanavičiene, Kaklauskas and Zavadskas, (2009:54) however argued that effective communication is required, to achieve good leadership because satisfactory and resourceful consultations are very significant for any organisation. Blomé (2010:354) revealed that effective communication facilitates mutual trust and a good reputation, and as such, human settlement management functions should incorporate a system of networking communication.

Then there is the question of strategy formulation, and this is where a performance measurement strategy should touch on 'operations' of the properties, in order to guarantee efficient utilisation of a building's usability, energy savings, cleaning, planned maintenance, chronological upgrading and operative exploitation of shared spaces and workplaces (Vermiglio 2011:434). In previous decades, the strategy has received excessive attention from both researchers and practitioners (Palm 2013:312), leading to its different definitions, one of which is 'leadership planning for the future.' That is why, in laying the foundation, performance measurement leadership should formulate a comprehensive property strategy that outlines the following critical aspects (Abdullah, Razak & Pakir 2011:21): clear objectives, knowledgeable personnel competent in formulating and executing strategy and a structure that will contribute to the efficient implementation of the strategy.

Leadership, communication and strategy formulation are vital inputs for global alignment, in terms of competitiveness and service quality. While there are fair global alignment opportunities for each country that competes in the global real estate market, being a leader in this global market requires a country to be fully mobilised, in order to walk the extra mile in fulfilling global alignment requirements. In performance measurement, one of the ways of successfully competing is by implementing sustainable practices (Tan, Shen & Yao 2011:227). Such implementation should also be imposed on the contractors, so they can implement

sustainable construction practices, to improve business competitiveness. This, unfortunately, is lacking in most developing countries' property management. Generally, they do not have sustainable properties. This has already been validated as a global concern in property markets. The developed performance model for the effective management of public sector properties in South Africa is necessary for sufficient and successful management of public sector properties, as it also encourages sustainable property and renewal of urban areas and public sector buildings.

One of the independent variables identified by the developed performance model for effective management of public sector properties are strategic factors around planning and formulation. It is through such a strategy that any organisation's competitive advantage will be identified (Liapis, Christofakis & Papacharalampous, 2011:281). Strategic analysis will suggest investment types applicable to the highest usage of company resources and competence. Similarly, if property owners want to maintain a fixed income, they ought to provide superior quality services (Razali & Juanil, 2011:371). That is why a human settlement / property management company should associate itself with a respectable quality monitoring association, for the enhancement of its reputation. By following quality regulatory requirements, it will become a reputable company. Quality management requirements such as those of ISO 9000 can facilitate an effective quality management system (Hui, Lau & Khan, 2011: 461). Therefore, obtaining ISO 9001 certification is advantageous over competitors, as this system can improve service quality and thereby improve business. Kwan (2019:170) observed that service quality has numerous benefits for achieving and sustaining a competitive advantage and that it is indeed a primary determinant of business success and failure, a gauge for corporate performance.

Public sector performance measurement leadership should also ensure that the environment is taken care of because if not, the environment can be dangerous. One environmental impact related to public sector performance measurement is catastrophes, which can also be referred to as disasters. Consequently, local government is always warned to be prepared to meet significant disruption to its operations (Nielsen, Sarasoja & Galamba, 2019:539). The government should outperform the private performance measurement companies in this regard. Disaster management competence is needed to avoid crisis conditions that might arise, as a result of disasters (Malalgoda, Amaratunga & Haigh, 2015:702). Also on issues related to the power supply, Kassier (2012:332) argued that renewable energy should be considered as an option to resolve power supply challenges. Kassier identifies renewable energy options such

as wind farms and solar energy supply that public sector performance measurement leadership could focus on developing as an alternative. Moreover, the government is also expected to have somewhat similar characteristics being a property owner itself. This is because creating a sustainable business environment for social enterprises to take care of disadvantaged groups is considered a responsibility of the government (Cheung & Chan 2012:177)

Proper environmental management is closely linked with sustainability in the built environment. Municipalities are responsible for assisting their communities with sustainable services. They must ensure that advanced levels of services to residents and businesses are delivered on a sustainable basis (South African Government: White Paper on Local Government, 1998:s B, ss 2.2). Such an obligation requires long-term infrastructural investment planning and a careful assessment of the level of services, which communities can afford. This is referred to as sustainable development, which is the integration of social, economic and environmental factors into planning, implementation and decision making, to ensure the ongoing development of services for present and for future generations.

It has been found that property owners and developers are looking at possibilities to increase the value of their properties (van Overmeeren & Gruis, 2011:186), in an attempt to impact the overall quality of a neighbourhood. van Overmeeren and Gruis believe that when the quality of neighbourhoods increases, property investment values rise as more people desire to live in such neighbourhoods; thus, quite logically, the market value of the properties therein increases. Furthermore, some of the property price motivators are higher disposable income, more housing sales, and increasing property investment value. The impact of urban renewal has a massive implication on property investment. Ultimately, local government is indeed about protecting and nourishing the investment that comes with it. However, inasmuch as developing cities and towns are busy pursuing sustainable development through their stated goals, the sad thing is that there is not much implemented with the intention of materialising sustainable development concepts (Musakwa & Niekerk, 2013:144). This calls for new approaches and methodologies to support sustainable land use management, especially in developing cities. That is why industry competence is crucial, not only for organisations such as local government but also for personal growth. For instance, training and development opportunities within companies can act as a tool for retention and for the motivation of performance measurement professionals who are at the foundation stage of their career (Azasu, 2012:458). This comes down to the fact that performance measurement is in existence because of its equally important stakeholders. All the above requirements involve finance where the central theme should be

value for money, meaning a satisfactory cost in relation to superior services (Kassem *et al*. 2015:265). They indicate further that a property management company should persistently endeavour to obtain quality products or services at the lowest reasonable costs, thereby facilitating public sector performance which will be capacitated with sufficient financial resources to support unexpected events such as environmental catastrophes (Kusumasari, Alam & Siddiqui, 2010:442). To do this successfully, it is essential that leadership continuously improves the financial capabilities of its local government. For effectiveness and rapid continuity, all investigated requirements for the successful management of public sector properties need monitoring, measurement and control, in terms of performance and risk management, as well as measurement and analysis. It is, therefore, imperative that a public sector performance measurement function has a performance appraisal system. This relates to the discovery that challenges associated with not having well-developed measures concerning property is a great problem (Abdullah, Razak & Pakir, 2011:21). Part of this is to ensure that there are preventive actions identified to monitor and to manage risks that could be detrimental to the smooth running of the business in the future (Čejková & Fabuš, 2015:106). Leadership maintains an organisation's wealth register which comprises material, finances, intangible assets, tangible assets and human resources; to identify the risk factors representing potential threats for a company. Organisations should continue to measure their business processes to improve their operations and service delivery to their customers (Amadi-Echendu & Pellissier 2014:97). All these requirements and others are comprehensively discussed later in this research.

3.3 Theoretical Framework

The focus of human settlement management is economic value with the objective of "total asset life cycle optimisation" (Pintelon & Parodi-Herz, 2008: 22). The objective adopts ideologies of management to aid the scientific practices of retaining a service in its state of functionality; or reinstating functionality from an old, dilapidated, system showing acute deficiency or failure (Márquez *et al*., 2009:314). Resource input (Land, food, water, finance, other resources), dynamics of settlements (Transport, economic, and cultural priorities), demography, culture, PESTEL, infrastructure development, professional expertise in Integrated Human Settlements Management, management and maintenance policy, demand and supply factors, stakeholders' perspective and other inherent factors are germane to the maintenance management process and they exert absolute pressure on an organisation, thereby determining the output of such a facility (Velmurugan & Dhingra 2015:1630; Selcuk, 2017:1672). Velmurugan and Dhingra

(2015:1629) while presenting a model for the formulation and the review of a maintenance strategy, considered it as the overall objective of the organisation, in order to achieve an acceptable margin of profit. Figure 3.1 illustrates the organisation of the activities of the management framework within the complexity and the dynamism of maintenance. Therefore, an organisation needs to consider the environment it exists in and its related strategic plans for maintenance management of its facilities, to achieve sustainability. He also suggested that in formulating an effective maintenance strategy, there is a need for a maintenance philosophy that will describe the roles of maintenance and fulfil the maintenance objectives and aims, as well as assessing and evaluating the maintenance practices and issues. The identified complexity and dynamism of maintenance management require a well-thought-out approach to aid the prime enterprise of a society (Lee & Scott, 2009:26). For sustainability of human settlements, the effort of stakeholders in the strategy and in the operation of the maintenance and management of assets is evident in the condition of the environment, the buildings and in its capacity to maintain its functionality throughout its useful lifecycle.   Therefore, a vital function in building performance is maintenance management, as it guarantees that the functional, structural and aesthetic conditions of housing and human settlements are sustained throughout its lifetime (Waziri & Roosli, 2013:65; Waziri & Vanduhe, 2013:23). Hence, maintenance management deserves to be a significant factor (Márquez, 2007:13) in the sustainability of human settlement. In this way, the health, the safety, and the quality of life of the occupants are boosted (Ackerman, 2016:19; Department of Housing and Public Works, 2017:4).
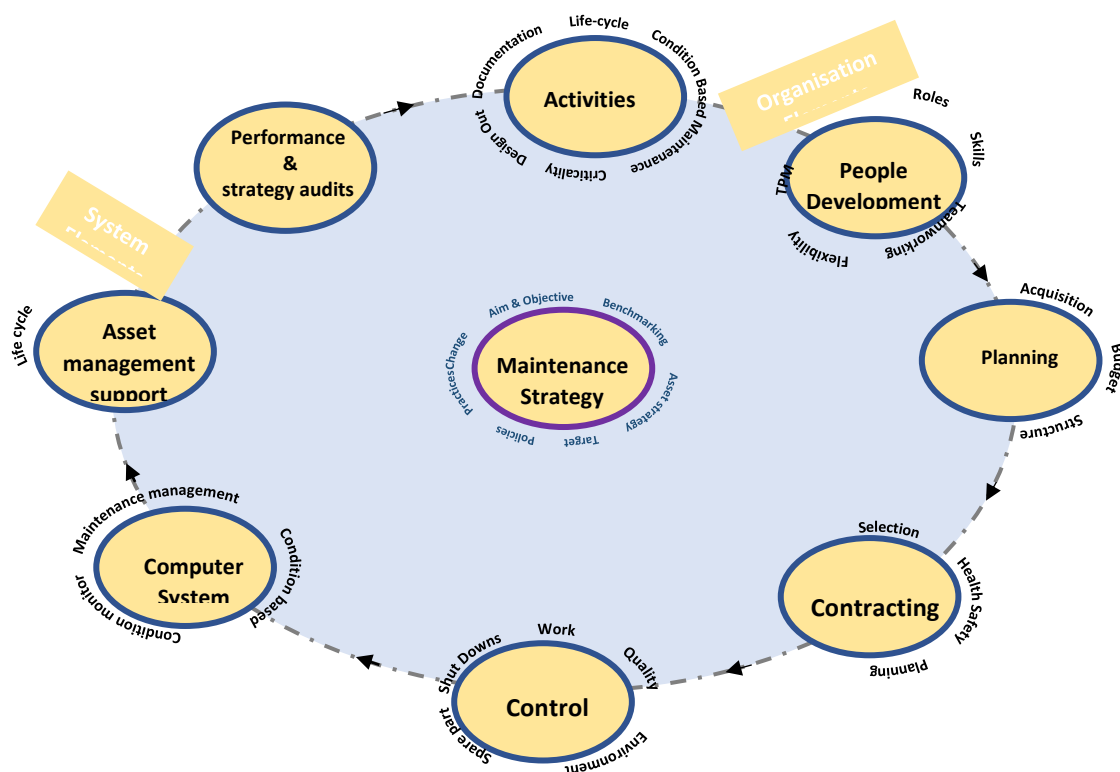
Figure 3. 1: Maintenance strategy elements adapted from Velmurugan and Dhingra (2015:1629).

Facilities, strategic and performance management, and maintenance policy and strategy are foremost attributes which require insight and sensitivity in the maintenance management of buildings as presented in figure 3.2 (Lee & Scott, 2009a:29).

Figure 3. 2: Aspects of building maintenance (Source: Lee & Scotts, (2009a:29)

Lee & Scotts, (2009a:29) notion in Figure 3.2 gives this study a different perspective by emphasising that maintenance policy and strategy are managerial roles in the maintenance management process. The notion falls in line with the definition of maintenance management by Crespo Marquez and Gupta, (2006:313) as: "all activities of management that determine the maintenance objectives, the priorities, strategies and the responsibilities." This study fuses maintenance policy and strategy with management processes, thus considering the sustainability factor. Figure 3.3 illustrates the perception of this fusion.
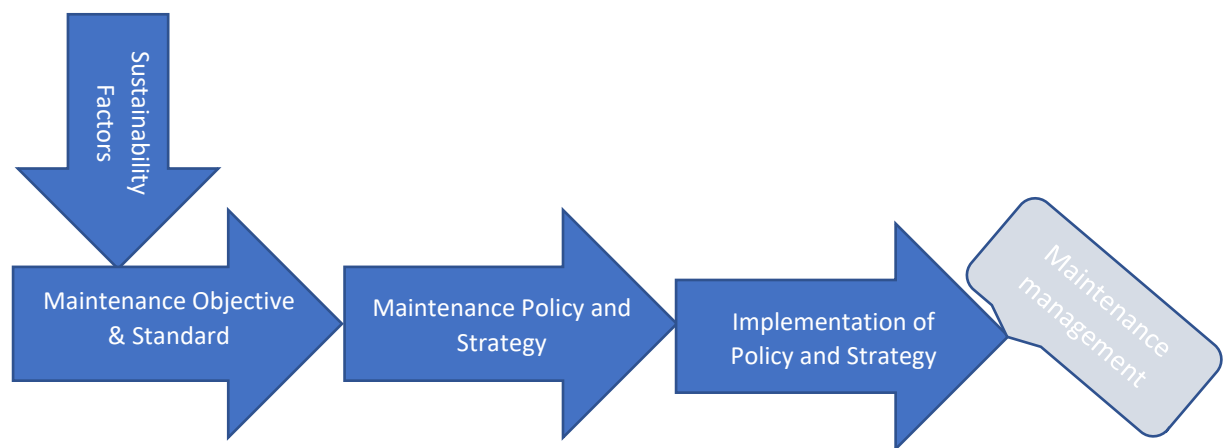
Figure 3. 3: Researchers' perception of the maintenance management process

3.3.1 Facilities Management

Facilities and services make up the fabric of the human settlement; they are also the lifeline and the bloodstream of the structure. The British Institute of Facilities Management (BIFM) defined Facilities Management (FM) as a discipline that amalgamates numerous activities within a system, with a view towards keeping and further upgrading all services that support and enhance the effectiveness of the critical interests of the organisation (Meng & Minogue, 2011:139; Wong & Fan, 2013:473). Lee & Scott (2008:88) opined that FM, as a multidisciplinary function, that encompasses all functions that relate to the management of real and movable assets.

FM is a focal point in resource management and service support in the built and work environment and it is the backbone of an organisation playing an integral role in the success of such (Chotipanich, 2004:364; Cigolini, Fedele, Garetti & Marco, 2008). Because of its essential role in an organisation, FM deals with various strategic issues by incorporating strategic management at the decision-making stage of an organisation (Chotipanich, 2004:364).

Moreover, in recent times, a variety of positions of FM practice includes those that give priority to property management, business support, customer and employee support, or a combination of these (Chotipanich, 2004:365). The position makes the function and the role of FM more comprehensive, with views on the list of support services within the FM remit (Chotipanich, 2004:365). In general, support services concerning FM vary from building operational services (Baldry, Amaratunga & Baldry, 2000:298), to construction management and real estate activities (Coenen, Von Felten & Schmid, 2010:425). Integrating the existing classifications of support services can thus give a broad scope of FM services, as shown in Figure 3.4.

In practice, however, FM has been adopted in different ways by different organisations, in line with their unique context. The reason for this is that the extent and the responsibility of FM in one organisation may be more comprehensive than in the others. Hence there is a probability that an organisation will require all the support from the services shown in Figure 3.4.

In dealing with building performance issues; performance management is a core function in the context of Facilities Management (Lee & Scott, 2009a:32). FM is a significant function that encompasses all property-related functions and supporting activities, of which maintenance, performance, and strategic management are three of its numerous functions (Lee & Scott, 2009:31; Lee & Scott, 2008:88).

Real Estate & Property Management
- Real estate/Property portfolio strategy
- Lease Negotiation and management
- Landlord activities and Rent review
- Leasing and sub-letting services
- Retail outlets and space renting

Facility Project Management
- Location searching and selection
- Acquisition and disposal of sites and buildings
- Relocation
- New building
- Extending & Alteration
- Demolition

Maintenance & Repairs
- Facility Refurbishment
- Building shell/fabric maintenance
- Maintenance and repair plant

Building services & operations
- Landscaping and landscape maintenance
- Cleaning and Housekeeping
- M&E/Operations/Run plant
- Energy distribution and management
- Waste disposal & Environment management
- Pest control
- Disaster prevention and recovery
- Health & Safety
- Security

Office services
- Office move service
- Post and mail distribution
- Courier services
- Telephones
- Records management
- Print and fax
- Storage and distribution
- Reprographics
- Reception, and telephone operator
- Public relations/Governmental affairs
- Travel arrangements
- Car fleet control
- Transportation
- Business hospitality

Planning & Programming
- Long-term resource planning
- Mid-term resource planning
- Annual resource planning
- Work programming
- Development planning

Space Planning and Management
- Facility planning/master planning
- Space Planning:
- Space configuration and reconfiguration
- Space allocation, utilisation and relocation
- Space use audit and monitoring
- Chum planning
- Office allocation

Operations Administration/ Management
- Administration and management
- Budget and cost control
- Purchasing and Contract control and negotiation
- Office furniture and stationary provision

Employee supports and Services
- Child Nursery provision
- Restroom
- Workplace nurseries
- Recreations
- Catering
- Residential accommodation
- Community affairs
- Employee special services

Figure 3. 4: Cluster of support services (Source: Chotipanich, 2004:366)

This study argues that the trio of maintenance management, strategic management, and performance management are critical within the framework of Facilities Management as represented in Figure 3.5.

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Facilities Management

Figure 3. 5: Conceptualizing maintenance management in the Facilities Management space (Researchers perception)

3.3.2 Strategic management

Strategic management as a process, that includes top management's assessment of the milieu in which an organisation operated preceding the formulation, implementation and regulation of a strategy (Akkermans & Van Oorschot 2018:931). With its purview in the domain of the top-notch executive, its responsibility as it relates to maintenance management is the preparation of maintenance policies that will direct maintenance managers in formulating programmes that will ensure the employment of a right maintenance strategy (Lee & Scott, 2009:31).

Without a proper strategic plan, a strategy no matter how good it is, is deficient, worthless and not fit for resource, operation deployment and implementation (Dziyaba, 2016:5). A strategic plan is a means to an end, as it provides a methodology for connecting the available and the desired in an organisation (Nickols 2016a). Figure 3.6 explains this concept. Nickols, (2016:2) posited that the concept of the strategy was borrowed from the military and adapted for use in business. He stated that strategy bridges the gap between policy and tactics and the infusion of both bridges the gap between ends and means (Figure 3.6). He discussed the issue further, stating that strategy is: "a term that refers to a complex web of thoughts, ideas, insights, experiences, goals, expertise, memories, perceptions, and expectations, that provides general guidance for specific actions, in pursuit of particular ends."

Figure 3. 6: Concept of strategy Adapted from (Nickols, 2016:1)

As Figure 3.7 indicates, strategic thinking that encompasses all the other concepts of strategy while strategic management indicates an effort to realise the fruits of strategic thinking. The thinking occurs via strategy formulation, strategic planning, and strategy deployment (that is putting it all into action) (Nickols, 2016a:8). Strategic management practice consists of three essential elements, strategy formulation, implementation, evaluation and control (Gure & Karugu, 2018:3).

Figure 3. 7: The "Nested" Concepts Related to Strategy adapted from Nickols (2016a:8)

3.3.2.1 Strategy formulation

At the formulation phase, a long-term blueprint is developed to ensure the operational administration of environmental opportunities and threats, considering corporate strengths and weaknesses (Gure & Karugu, 2018:3). The phase includes specifying the corporate mission, outlining feasible objectives, evolving strategies, and setting policy procedures (Alkhafaji, 2013:5; Pearce & Robinson, 2011:2). In formulating a strategy, the plan must not deviate from the set goals and objectives of an organisation (Telesford & Strachan, 2017:37); and alternative strategy must also be formulated to mitigate the business from the risk that comes along with an inconsistent environment (Gure & Karugu, 2018:3).

3.3.2.2 Strategy implementation

Allocation of roles and responsibilities to resource managers are at the implementation stage. Achieving this can occur through the design of the organogram, allocating resources, setting short-term objectives, and designing the organisation's controls and incentives (Akkermans & Van Oorschot, 2018:931). Strategy implementation involves developing a strategy-support culture, creating an effective and efficient organisational structure, readdressing marketing efforts, preparing budgets, developing and utilising information systems, and linking employee compensation to work performance (David, 2011:6).

3.3.2.3 Strategy evaluation

In this phase, the effectiveness of a strategy is assessed, to identify shortfalls of a plan for necessary adjustment, where the goals are not being met (Tse, 2014:7) and strategies are not being re-formulated.

3.4 The Role of Performance management in Property Management

Performance management (PM) is "a continuous process of identifying, measuring, and developing the performance of individuals and teams and aligning performance with the strategic goals of the organisation" (Aguinis, 2009:2; McMahon, 2006:13). It also ensures that the achievement of set goals are tackled in the most efficient and effective manner, by connecting individual performances and objectives to the overall mission and goals of the organisation (Aguinis, Joo & Gottfredson, 2011:2). In the words of Kumari & Malhotra, (2012:77) performance measurement focuses on three essential functions to improve efficiency,

which are; creating relationships between corporate planning, setting budgets and service planning and monitoring.

Performance measurement is the backbone of an organisation that enables better perception of employees that provides employers with ideas on how to boost employees' self-esteem, develop their competencies and their motivation to perform. It also makes an organisations vision and goals clearer to all the hierarchies in the organisation; thereby giving the workforce a better understanding of job definitions. Furthermore, performance measurement helps to identify appropriate administrative actions quickly, with the aid of performance evaluation, for review and subsequent implementation (Aguinis, 2013:4). Performance measurement as a vital management principle is crucial in the performance measurement process, and it provides a vital connection between strategic and managerial actions, while supporting the development of performance indicators necessary for performance evaluation (Munchiri, Pintelon, Gelders & Martin, 2011:296; Van Horenbeek & Pintelon, 2014:335). Other essential functions of performance measurement include setting goals and objectives, observing performance, education, and training, receiving feedback and conducting reviews (Aguinis, 2013:4). The degree of hygiene, public safety, quality of ventilation, thermal comfort, the building facilities, services management and efficiency and effectiveness of energy are concerns of performance management in the built environment (Lee & Scott, 2008:82, 2009a:31, 2009b:270).

Performance evaluation underscores the understanding of the physical and the functional conditions of existing buildings in the performance management milieu (Agyefi-Mensah, 2013:6) and consistent monitoring of maintenance operations is vital to the success or otherwise of an organisations' strategic objectives (Munchiri, Pintelon, Gelders & Martin, 2011:295).

3.5 The Conceptual Framework

Framework conceptualisation in research denotes the thoughts and the plans of the researcher as it stems out of the established theoretical framework. The conceptualised framework provides the basis and the platform as a springboard for the methodology. In researching the development of a model for managing human settlements for sustainability, the researcher classified the dependent variable as: 'Perceived Successful Sustainable & Integrated Human Settlement'. The review of the related literature also identified the variables of "resource input" – 'Land, food, water, finance, other resources' and "dynamics of settlements" - 'Transport, economic, and cultural priorities' as the intervening variables. Demography, culture, PESTEL, infrastructure development, professional expertise in Integrated Human Management,

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management and maintenance policy, demand and supply factors, stakeholders' perspective and other inherent factors as antecedent variables.

Rapid development which has resulted in urbanisation has generated considerable challenges, which include but is not limited to; the growing number of slum and slum dwellers, increased pollution in the environment, the dearth of essential services and infrastructure, "accidental" urban sprawl among others, which makes cities prone to disasters. To achieve a sustainable and integrated human settlement, that is making cities more inclusive, safe, resilient and sustainable, there is a need for better planning and subsequent management.

The reservations on the need for a model are laid to rest by UN-Habitat, (2010:1) which states that: "cities must become priority areas for public policies, with an increased investment to build governance capacities, provide service delivery, affordable housing provision and stronger economies." Supporting this, the United Nations Sustainable Development Goal 11 (United Nations, 2015) "seeks to make cities and human settlements inclusive, safe, resilient and sustainable." The goal of this study is to explicate how professionals and practitioners can achieve a successful sustainable human settlement, through correct management. It will further endeavour to add to the body of knowledge with regard to managing human settlements sustainably in Africa and in the world at large.

A study conducted by Berke & Conroy, (2000:30) revealed that planners must engage different intervention and dispute resolution procedures that are essential in formulating management policies that are required to achieve balance between sustainability principles. As indicated by Cigolini, Fedele, Garetti and Marco, (2008:284) and Hui, Zhang, Zheng and Zhang, (2013:195), property management aims at optimising profit operation and the administration of all types of interest and physical structures, for the owner. The implication of this is that if there is to be a sustainable human settlement, there must be proper management of all the facilities and services that make up the gamut of the human settlement space.

The same notion was taken up by Wai-Chung Lai, (2006:71) who hypothesised an under-estimation of the role of property management in fostering sustainable development and he posited that property management is an integral part of resource management for sustainable development. The goal of human settlements management is to grant and to empower communities to enhance their living environment as well as to maintain them at a sustainable level (Van Wyk & Van Wyk, 2001:80). The requirement of this is that all components of the human settlement must be well managed and maintained.

From this view, it would be safe to say that sustainable human settlement management comprises skill and understanding of business management doctrines, property management, the law of contract and tort and the physiology of the built environment. The implication of this is that the human settlement attribute, as well as its sustainability, is dependent on specific information acquired from the present human settlement form, the end-users and the style of management adopted. Hence, human settlement maintenance management will include all the work, procedures and actions that enable the utilisation of the available physical and fiscal resources effectively and efficiently, towards achieving a set goal. The most crucial challenge for the management of human settlements is the incorporation of different perceptions of the built environment and of the related professionals engaged in the development agenda. This challenge underscores the vital importance of the coordination and facilitation of integrating human settlement management, by all stakeholders.

Age is another challenge recognised by Cheng *et al*. (2017:3) who argued that age is likely to be confounded with the physical condition of the urban building unless sufficient care (maintenance and management) is employed to avoid that possibility. Muldoon-Smith & Greenhalgh (2019:62) also posited that facilities and services depreciate with age, but that proper management and maintenance could prolong the life and aesthetics of such buildings. Burger (1994:41) developed a model of housing development in a bid to measure its influence on beneficiaries; with a focus on the homeless. He acknowledged that housing is a process and emphasised the importance of management as part of the process of linking inputs and outputs in the housing (human settlement development) delivery process. See Figure 3.8.
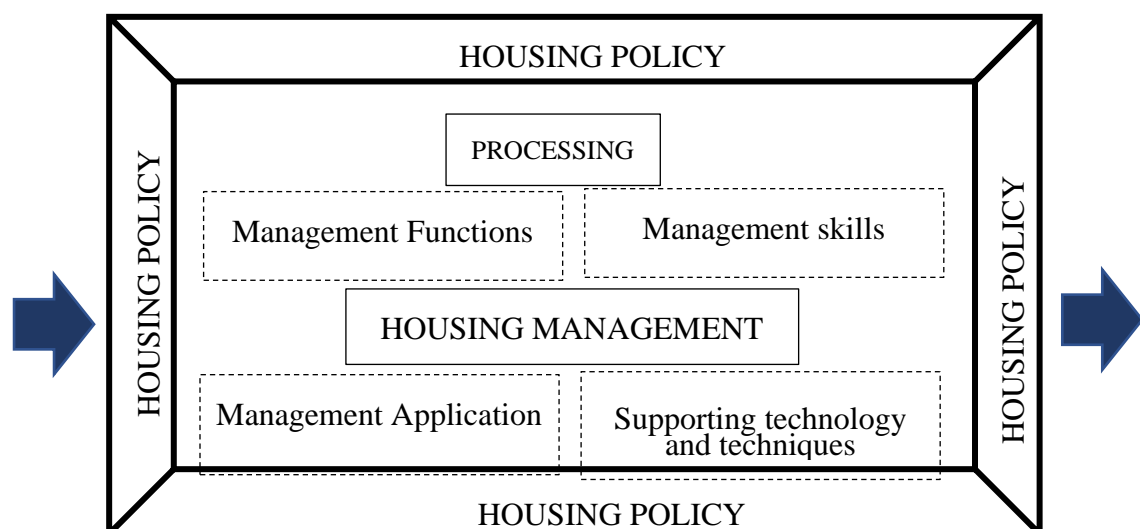
Figure 3. 8: The processing component in Burger's housing conceptualisation model

Burgers' model identified essential components to be included in a generic human settlement management model as: resources (human, financial, information and natural), environmental and contextual machineries (political, economic, social, technological, environment, legal, physical and cultural) and participants and stakeholders (consumers, competitors, suppliers and regulators). He recommended utilising practitioners knowledge in aspects of non-conventional management of finances, facilities, and resources.

However, the major inadequacy of the model is that, due to the uncertain nature of human settlement development, the input-output approach is too dogmatic for the human settlement process. It does not also acknowledge the interrelationship among the components and it also lacks goals and an outcomes-based approach. To this end, therefore, a cyclic process with monitoring and evaluation is preferred. White (1986:199) foresaw the need to incorporate the goals of housing as part of his conceptual framework for the study of housing. He also acknowledged housing as a product, an environment, a process and a service which requires a multi-disciplinary approach with the goal of improving the quality of life of individuals, households, communities and to achieve a high-quality living environment by pursuing the goals of sustainable human settlement. He also acknowledged the challenges of managing resources effectively, due to the interdependence of housing needs and wants, as well as investment decisions and public policy objectives for housing and community development. The description of housing as a service by White (1986:189) reflects the responsibility of professionals and practitioners to guarantee decent living environments.

In the construction of his model, Van Wyk (2014:224) posited that the human settlement context consists of social, cultural, economic, technological, natural, ecological and political components. He stated that the components are all integrated and interrelated and the right mix of each birthed sustainable human settlement. He further grouped the components into three main categories; namely overall goal, enabling benefits and outcome, and he cited various variables within the purview of each category. He posited that Human Settlement Management involves the fulfilment of three primary roles, as shown in Figure 3.9. Van Wyk's model, which shows arrows indicating further relationships save for the feedback arrow which creates a loop, advocated that sound housing management should produce benefits and outcomes for families and communities, the housing sector and society; as listed in Figure 3.9.

In order to trigger the systems and the processes, networks must also be generated and maintained with stakeholders, to obtain their co-operation, their input and their support.

Obtainable housing resources which include financial, human, material and other types of resources, policies and strategies must be developed, to give guidance and direction for the succeeding stages and through consultation with all role players. The component of the model involves the management of all the processes through appropriate systems most effectively and efficiently as possible, utilising minimum resources to achieve optimum desired outcomes. Further details of these processes and systems, as well as details of the other components of the model, are listed in Figure 3.9.

Van Wyk's model, as good as it is, did not, however, show achievability in the management of human settlements as well as the fusion of Estate Management principles with sustainability factors. With the all-inclusive dynamics associated with human settlement management, the research is aimed at pursuing the aims and the objectives stated earlier, to advance a new model for realising successful sustainable human settlement through effective Estate Management practices fusing sustainability dynamics of the built environment.
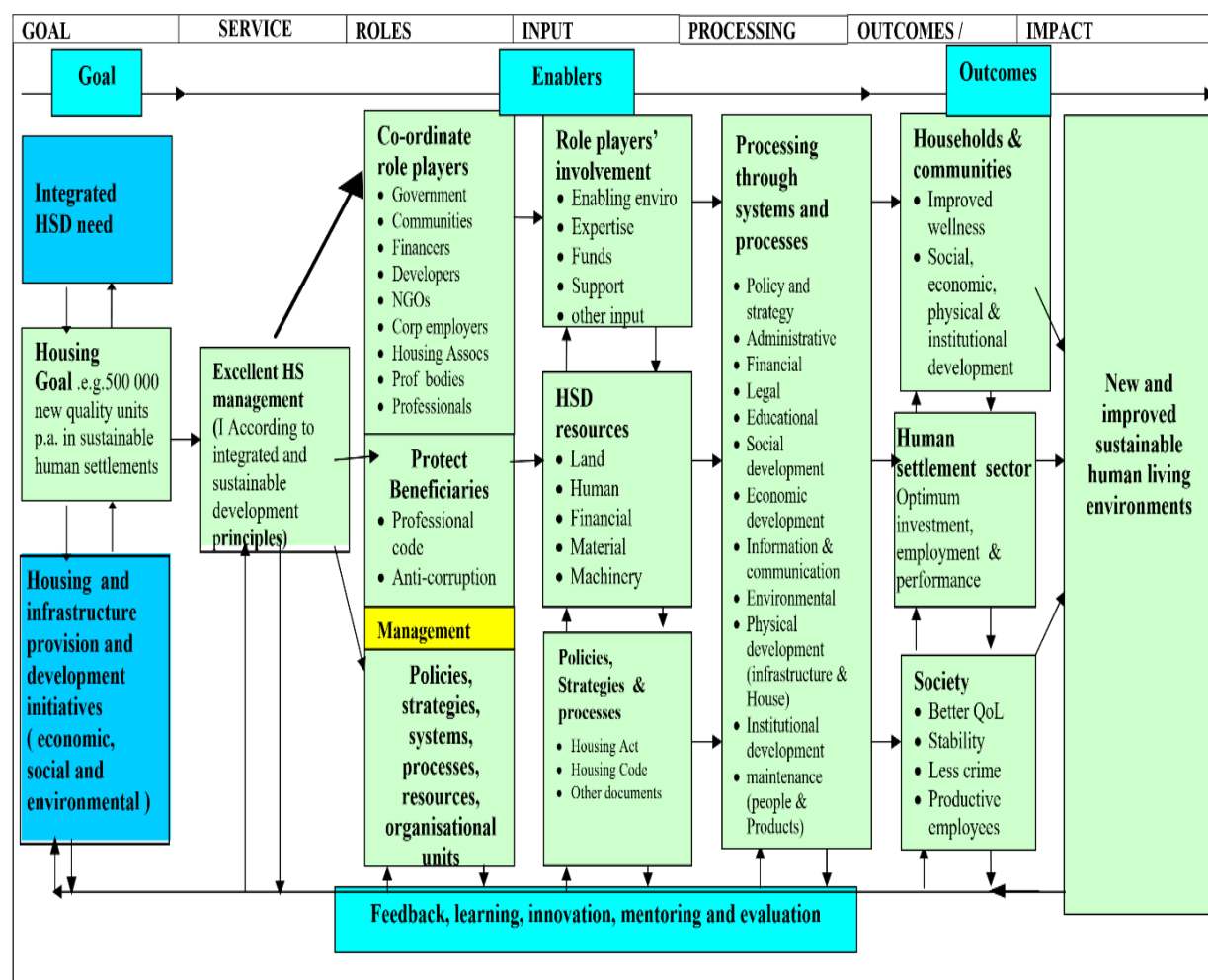
Figure 3. 9: Van Wyk's Human settlement management model

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Based on the perceptions stemming out of the theoretical features of property and human settlement management, which are crucial to this study, Figure 3.10 introduces a conceptual framework to pilot the approach of investigating the human settlement environment of Nigeria and South Africa, as it relates to their management for sustainability.

Antecedent and intervening variables determine human settlement sustainability, and they are persistently pressurised by social, environmental and economic factors, which have a significant influence on the success or otherwise realising their aims (Chanter & Swallow, 2007:58).

The conceptual framework of this research is aware of internal and external factors and other factors that are floating around, as shown in Figure 3.10, which illustrates the conceptual framework of the study. The framework embodies both the external and the internal environment of a human settlement, and provides a foundation for the research methodology.

Figure 3.11 also shows the components of integrated sustainable human settlements. The outermost layer shows the various factors that form the basis for the development of human settlements, as captured by Adedeji (2011); Department of Human Settlements (n.d.) and the World Health Organization (1999).

Resource input which is the crux of the second layer is identified by Newton *et al.*, (2001) which is germane to the actual development of human settlements, and in turn, they are affected by cultural, economic and transport priorities (Njoh, 2017:1-10) and these priorities operate on the platform of social, economic and environmental factors which are in themselves sustainability factors. The triad of environmental sustainability, economic sustainability, and social sustainability is the most widely accepted as a model for addressing sustainability.

The concept of "social sustainability" in this approach encompasses such topics as social equity, liveability, health equity, community development, social capital, social support, human rights, labour rights, placemaking, social responsibility, social justice, cultural competence, community resilience, and human adaptation.

Lok, Opoku & Baldry (2018:2292) and Maletič *et al.*. (2018:4772) explored the relationship between sustainability and physical asset management and their study produced a framework of interrelated constructs which identified maintenance management, performance management and strategic management as being germane to the relationship as well as being the basis for the measurement of performance.
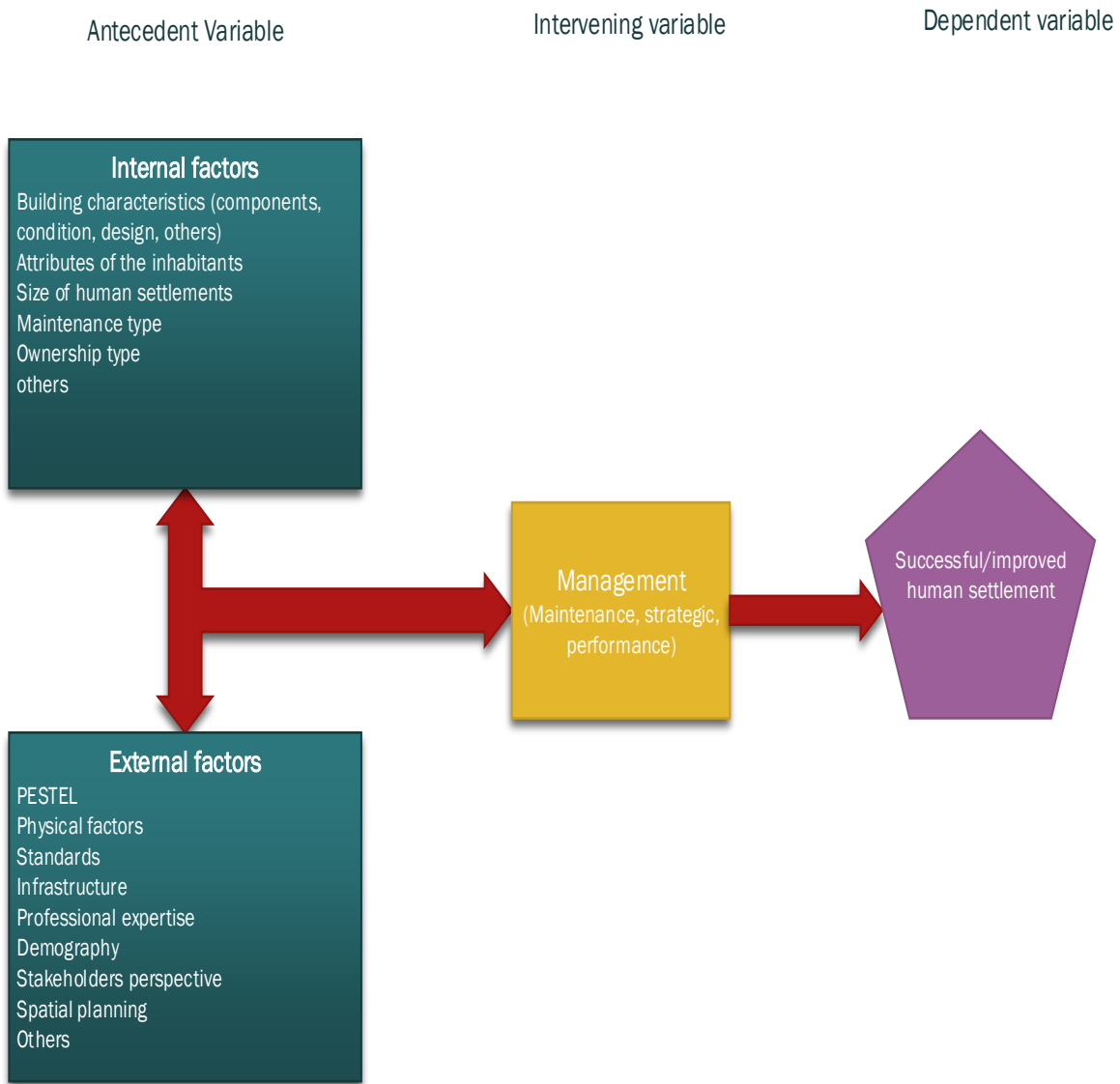
Figure 3. 10: Conceptual construct for successful / improved human settlement management (Authors Construct)

3.6 Summary of the Chapter

Presented in this chapter are the underpinning theories of maintenance management, as well as its interrelationships with strategic and performance management. It also revealed the correlation of maintenance management, strategic management and performance management with Facilities Management.

Finally, the chapter presented a conceptual framework that guides the research investigation, which gives the basis for the next chapter, to discuss the theoretical understanding of the methodology and the description of the approach adopted for this research.
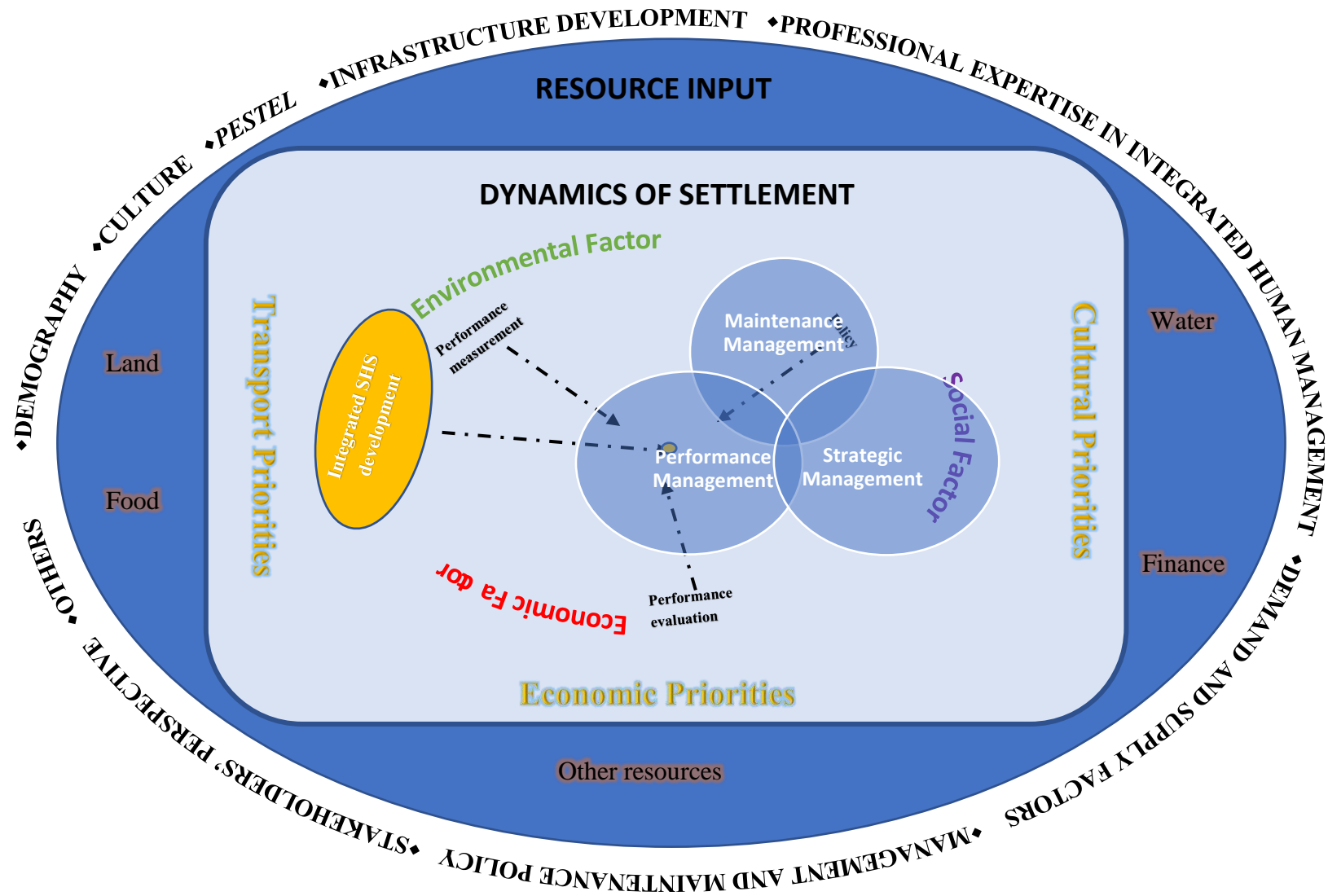
Figure 3. 11: Components of integrated sustainable human settlements management and development context (Authors Construct)

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

The previous chapters have explored some perceptions of the research perspective; principally on the management of human settlements for sustainability, in both industrialised and emerging countries. The formulation of research questions established is based on the findings of literature and information acquired. This chapter discusses the research philosophy, methods, design, and approaches used for this research study. It also identifies and examines the relevant theoretical background of the research methodology used, in a bid to have a better understanding of its various attributes. The chapter further introduces the basis for the choice of the research philosophy, methods, design and analytical approach for the study.

At this point, it is imperative to reiterate the objectives of this research study, while considering the research design. They are as follows:

    i.   To study existing human settlement neighbourhoods in Nigeria and in South Africa;

    ii.   To assess the Estate Management principles used in the management of integrated human settlements in Nigeria and in South Africa;

    iii.   To ascertain human settlement maintenance and management types and practices in Nigeria and in South Africa

    iv.   To conceptualise sustainability in human settlements management and identify those factors that are beneficial to integrated human settlements in Nigeria and in South Africa; and

    v.   To establish a feasible and workable sustainable human settlement management structure, that would enhance living conditions and environmental quality in the study areas.

4.2 Research Definition and Objectives

Neuman (2014:13) characterises research as the use of scientific methods to transform ideas, questions, and hunches (hypotheses) into scientific knowledge. In another vein, Leedy and Ormrod (2015:2) describe research as a "systematic process of collecting, analysing and interpreting information (data) to increase our understanding about that which we are interested in or concerned about." In delineating the objective of research, Gupta and Singh (2009:4) opined that its objective is to find answers to probing questions, using a scientific process.

Rajasekar, Philominathan and Chinnathambi (2006:23) further stated that its goal is to uncover hidden truths.

Gupta and Singh, (2009:4) in their delineation categorised the objectives as to:

i.   gain an understanding of a phenomenon or to achieve a new perception of it;

ii.   discover new knowledge through an analytical investigation;

iii. find out the level of occurrence or association of some variables;

iv.   make forecasts through hypothesising an association between variables;

v.   gain new insight into an occurrence and its rationalisation; and

vi.   advance a new theory or contribute to an existing theory.

4.3 Research Methodology and Methods

As indicated by Fellows and Liu (2003:1), research methodology refers to the principles and the procedures of logical thought processes which apply to a scientific investigation. Leedy and Ormrod (2015:2) describe research as: "a systematic process of collecting, analysing and interpreting information (data) to increase our understanding about that which we are interested in or concerned about." This same view was presented by, Morenikeji (2006:38) who posited that the general term "methodology" is subsumed in method and methodology itself.

Morenikeji (2006:38) makes the distinction between the two by saying that "methodology" means the philosophy of the research process and it is inclusive of the values and the assumptions that serve as a rationale for research and the standard criteria the researcher uses for interpreting data and to reach a conclusion. He described the "methods" as merely meaning the research technique or the tool used to gather data. Thus, within a research methodology, different methods or tools may be used to accomplish the aim and the objectives of the research (Sutrisna, 2009:51).

The researcher's choice of research methodology and methods in management and social sciences exemplifies the researcher's views about the nature of the social world and the type of knowledge to be gained (Shakantu, 2004:160; Cresswell & Clark, 2011:5–21).

These assumptions or paradigms are vital for the research because the researcher's chosen methods must mirror the context of the fundamental assumptions. The proceeding sections present the philosophical foundations or the bases and the paradigms of research.

4.4 The Research Philosophy and Paradigm

Towards providing a proper philosophical stance for this research, it is essential to present a descriptive analysis of the different philosophical beliefs about the nature of the social world. The rationale for this is because exploration mostly probes the reasons for studying philosophical issues in research and explicitly with an allusion to research methodology.

In identifying the rationale for the significance of the exploration of philosophy in research methodology, Easterby-Smith, Thrope and Jackson (2008) revealed that it can help the researcher to refine and to specify the research methods in terms of the source and type of evidence collected and how its interpretation helps with answering the research questions. They further affirmed that the knowledge of research philosophy aids the researcher in evaluating different methodologies and methods to avoid misuse and needless effort.

The researcher hence ascertains the drawbacks of an approach early. They concluded that it might assist the creativity and the innovativeness of the researcher when s/he selects or adapts methods that had previously been outside his experience. Moreover, the nature of philosophical enquiry often encourages thorough thoughtfulness, and this often generates further questions about the topic under investigation (Crossan, 2013:53). Thus, understanding philosophical issues provides a sound basis for a methodological argument concerning the research.

4.4.1 Research philosophy

In discussing the research methodology, many researchers have a preference for understanding complex philosophical perceptions within the context of the two main conventions of research inquiry, commonly known as quantitative and qualitative lines of inquiry (Bryman, 2016:32; Creswell, 2014b:25). Hence, understanding research methods cannot be isolated from the researcher's philosophical (ontological, epistemological, axiological and pragmatic) beliefs. Therefore, the four essential aspects of discerning research philosophy as recommended by Sutrisna (2009:48) and Cresswell and Clark (2011:388) are crucial for consideration.

4.4.1.1 Ontology

The nature of knowledge often referred to as an ontology, reviews the 'claims' and the postulations made concerning the nature of reality; claims regarding what exists, its appearance, its components, and how these components interact with one another (Mayer 2015:54). Eriksson and Kovalainen, (2008:13) and Neuman, (2014:92) describe ontology as

"the characteristics and the form of reality". Shakantu (2004:162) ascertains "Parmenidean and Heraclitean" as two seemingly opposing and competing ontological views in which the researchers and the sociologists can establish their methodology. In understanding Parmenidean perspective, he affirmed that "the reality is composed of clear entities with identifiable or discrete properties and characteristics" while in the Heraclitean standpoint, "inclusively processual" is the perceived reality.

All objects are in constant fluidity, irrespective of how the mind figures them out and describes them and this divergence in ontological views only offers a shared terminology, which can be used to define objects and concepts that exist, their features as well as their correlations and hence, a conception of reality and existence. Hence, ontology studies being or existence, their primary classifications and relationships, is to ascertain the existence of entities and their types (Sutrisna, 2009:51).

Gill and Johnson (2010:210) affirm that ontology deals with the core of phenomena and the nature of their existence. Based on whether the external world has a predetermined nature and structure or not; there are two types of ontological views viz. realist and idealist / subjectivists ontologies (Sexton, 2004:103). Realists start with a position of a commonly experienced external realism with pre-set nature and structure, while idealists presume that different observers may have diverging viewpoints and that there is a variation in space and time on what signifies the truth. Realists assert that social reality exists and that it is independent of the researcher's insight or reasoning. Idealist or subjectivists maintain that social reality is about prognosis of the researcher's perception and understanding. The social world is created by perceiving it (Gill & Johnson, 2010:210). Realists aver that there is one objective reality that can be discerned by an enquirer who has little or no impact on the observed object, while subjectivists on their part aver that the external world is real, due to the observers constructs of it and the way he experiences it.

Gill and Johnson, (2010:187) also observed the nature and the content of the problem to be researched and the degree of influence of the availability of resources on the methodological approach. They further suggested that the view is superficial because when researchers conceptualise their study, they covertly deploy philosophical conventions that inform their comprehension and their construction of issues in a certain way. They note that the philosophical assumptions made by the researcher require numerous approaches to the nature of truth and human behaviour, the likelihood of unbiased illustration of the facts and the

independent investigation of the existence of social reality. Gill and Johnson, (2010:178) revealed that a procedural choice involves taking a philosophical stance and the hidden aspects of the research must be sought out by the researcher. As stated by Eriksson and Kovalainen, (2008:13), the ontological background and the epistemology have a close affiliation in research, and this makes each ontological stance have a similar epistemological perception. The next section, therefore, expounds on the underlying concepts of epistemology.

4.4.1.2 Epistemology

In research, epistemology is all about the concept, the sources, the extent, the rationale, and the justification of knowledge (Stone, 2008:264). Eriksson and Kovalainen (2008:14) highlighted that the epistemological attribute of research philosophy deals with the invention of knowledge and the assertions surrounding the potentials of knowing. In simple terms, epistemology defines the researcher's knowledge about reality, as well as assumptions as to how knowledge ought to be obtained and admitted. Hence, epistemology is therefore concerned with "how" and "what" the researcher knows and further about "how" and "what" it is possible to know (Shakantu, 2004:161).

In epistemological undertakings, the duo of positivism and interpretivism are paradigms used and they are at times referred to as objectivist and subjectivist views. To the objectivist, knowledge about the external world is available in a raw form, with little or no modifications while the subjectivist presupposes that it is feasible to obtain knowledge about the external world. In their review of research philosophy, Easterby-Smith, Thrope and Jackson (2008:135) also refer to the two ends of epistemological undertakings as positivism and constructionism. The positivists believe that the social world exists externally, and that the assessment of its elements is attained through objective measures where the observer must be independent of the observed phenomenon. On the other hand, social constructivism originates from the view that reality is not objective and exterior; it is a social construct that is expounded by people who are conscious, purposive actors with notions about their world who attach meanings to occurrences around them (Robson, 2014:2526).

Critics have observed the perceived competition among the two leading schools of thought. The two schools of thought demonstrate the complexity of the issues embodied in epistemological and ontological viewpoints, by observation and interpretation (Eriksson & Kovalainen, 2008:14). Neuman, (2014:79-80) stated that the two schools of thought had resulted in several bitter arguments in modern-day sociology. The viewpoint was confirmed by

Bergman (2008:11) who discussed the 'Paradigm Wars' and the 'Incompatibility Thesis', which are opinions that exist between the positivist and constructionist methodologies.

In simplifying the two philosophical viewpoints, Sutrisna (2009:52) stated that positivism mainly holds objectivism as the core of understanding reality and that there is only one objective reality encountered by all. Likewise, interpretivism primarily takes constructivism as the core of understanding reality, which is constructed independently and interpreted differently. Each of the two beliefs is multi-dimensional, and this underscores the two-dimensional continuum explained by Sutrisna (2009:52), to highlight the relationship between the two philosophical beliefs. The next section will give a better understanding of this issue.

4.4.1.3 Axiology

Axiology questions the role of values in research choices and value judgements (Saunders, Lewis & Thornhill, 2008:109). It postulates that in qualitative research, the researcher acknowledges as valid, the value-laden nature of the study and unreservedly registers his or her values and bias for, as well as the value, of knowledge supplied from the field by the informants (Cresswell & Clark, 2011:200; Saunders, Lewis & Thornhill, 2008: 175). Therefore, human beliefs and experiences determine his or her choice as to what to do and how to do it (Easterby-Smith, Thrope & Jackson, 2008:123). In a positivist paradigm alternatively, it provides for the elimination of the researcher's values and biases in the study. The implication of this is that a scientific principle governs the researcher's choice of what to do, and how to do it (Easterby-Smith, Thrope & Jackson, 2008:124). To this end, it is the philosophical perception, method, approach and data collection procedure choice that is defined by one's values (Saunders, Lewis & Thornhill, 2008:116).

4.4.1.4 Pragmatism

This belief about choosing between epistemology, ontology or axiology is to a certain degree impractical in real life; and the contention is that the primary determinant of which stance to adopt is the research questions (Cresswell & Clark, 2011:389; Saunders, Lewis & Thornhill, 2008:128). It is also germane that where the research question does not give a clear route that either a positivist or an interpretive philosophy should be embraced in an inquiry, for example, within an epistemological viewpoint (Pansiri, 2005:191; Pansiri, 2008:84; Babbie, 2013:34). Constructivism argues that the formation of knowledge is within the mental framework and the

general perceptions of an individual lacks obvious infractions, but they are exclusively subjective understandings (Eriksson & Kovalainen, 2008:34).

However, as a paradigm, pragmatism is concerned with a solution to difficulties. The mandate of research in the view of a pragmatist is to search out truth or reality through a human problem-solving methodology (Johnson, Onwuegbuzie & Turner, 2007:112-133). Pragmatism embraces the points of view of two philosophical stances - positivism / post-positivism and constructivism, as it approves of both qualitative and quantitative methods. Positivism supposes that an enquiry is value-free while constructivism believes otherwise. Pragmatism, however, believes that values are essential in a research process when it comes to the interpretation of results and that external reality should be acknowledged, as well as its influence on the presentation of correct explanations (Tashakkori & Teddlie, 2010:271-276).

Considering a suitable methodology for practical research, Tashakkori and Teddlie, (2010:275-276) contend that regarding the approach of enquiry, pragmatism embraces the two extremes usually taken by post-positivism and those that favour constructivism. The former emphasises quantitative methodology while the latter emphasises qualitative methodology. Pragmatism, therefore, is the rallying point for the two opposing ends in methodological differences. Hence, the recommendation of both qualitative and quantitative methods to resolve a real-life world challenge.

Nevertheless, quantitative and qualitative methods are the two main traditional methods within the overriding research methodology and philosophy, but today, a mixed-method approach exists, which represents deductive as well as inductive reasoning; as well as a mixture of both; (Johnson, Onwuegbuzie & Turner, 2007:112-133; Tashakkori & Teddlie, 2010:271; Creswell, 2014). Moreover, the choice of a method is influenced by certain factors such as the researched topic; the objectives; and the specifically proposed research questions. Creswell (2014b:212) added that other factors such as: sustaining personal interest; questioning whether it is publishable in a scholarly journal; and whether it develops a new idea in scholarly literature, are equally important.

4.5 Research Paradigm

Pansiri (2005:192) has asserted that there are two dominant social science paradigms namely the 'positivist / functional' and the 'interpretative' approaches to research and that they have dominated claims regarding their respective superiority in management research; with several

authors identifying several different paradigms which fundamentally hinge on this positivist or interpretative dissimilarity. In the social sciences, a research paradigm defines the broad framework of reasoning and the classifying of observations (Babbie, 2008:31). They are assumptions and perceptual orientations shared by academic researchers (Donmoyer, 2008:591). Positivism and phenomenology (interpretivism) are two ends of a pole in research paradigms, and each centres around two assumptions (ontology and epistemology) discussed above. The subsequent subsections give the researcher's perception of the opinions about the two paradigms.

4.5.1 The positivist paradigm

The phrase "positivism" in general, symbolises the belief in a rationally established structured, objective reality (Babbie, 2008:34). With its origin arising from the thinking of Comte in 1853; for centuries, positivism was the principal method of scientific enquiry, resulting from the study of natural sciences. Undeniably, the conventional scientific approach to research has its foundations in the beliefs of positivism. The positivist paradigm is one of objectivism as the observer and the observed are separate objects. Positivists believe that a researcher's approach to enquiry must be unbiased and thus suggests that the generation of distinct and quantifiable scientific data should employ absolute senses and by so doing, there is a reduction or the eradication of subjectivity (Okolie, 2011:127).

The underlying reasoning of positivism presumes that an objective reality exists, that it is independent of human behaviour and that it is not merely a conception of the human mind. It advocates that one's senses should be used to gather data that is objective, discernible and measurable only. The implication is that positivism assumes that the real world can only be researched through the use of methods that reject any human influence over its apprehension or otherwise (Nongiba 2008:87). The over-all attributes of the positivist philosophy have numerous implications for researchers and social scientists.

Easterby-Smith, Thrope and Jackson (2008); Pathirage, Amaratunga and Haigh (2008) listed some of the implications to include:

- **Methodological:** all research should be quantitative and, as such can form the core for valid overviews and laws;
- **Value-freedom:** objective standards should influence the option of how to study and what to study as opposed to human views and interests;

- **Causality:** the purpose should be to recognise fundamental descriptions and laws that explicate human behaviour;
- **Independence:** the researcher is unbiased of the subject under investigation; and
- **Reductionism:** challenges are grasped better when condensed to the simplest possible constituents.

Nevertheless, an advantage of positivism is that control of the research process is much more comfortable as the researcher has a clear theoretical focus of the research at an early stage of the research process as presented in Figure 4.1. However, the research approach is weak in offering an in-depth appreciation of social phenomena, and it is also difficult to investigate the connotations attached to social phenomena (Raddon 2010:7).
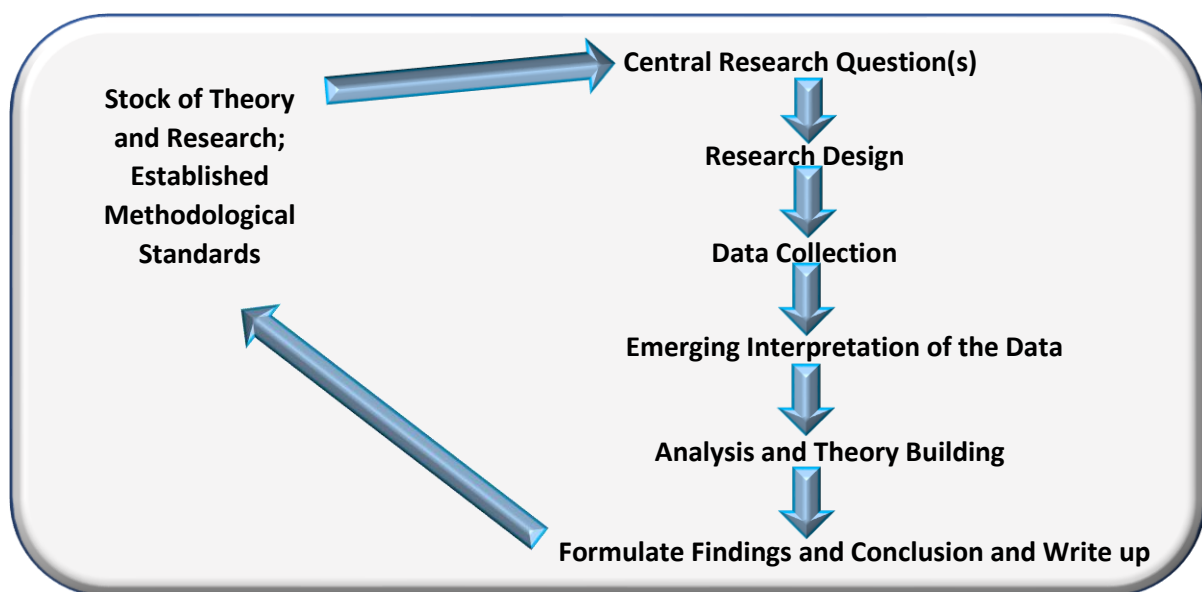
Figure 4. 1: The positivist view of the research process (Raddon 2010:13)

4.5.2 Phenomenological / Interpretivist paradigm

A phenomenon is an apparent incidence, experience, condition or fact that is manifest to the senses. Phenomenology, with its origin in the social sciences, is concerned with methods that study people and their social behaviour and hence it sees the social world as a world of meanings. Thus, the social world is not made up of entities which are external to the subjective experience of its members. The phenomenological or the interpretivist perspective presents researchers and social scientists with a radical substitute to the positivist methodology. The phenomenological paradigm views the subject matter of the natural sciences and that of the social sciences differently.

The subject matter of natural science deals with objects which lacks consciousness and hence described its behaviour as a reaction to the external stimuli. However, human beings perceive, interpret and experience the world by actively constructing their social reality. Meanwhile, meanings do not have independent actuality; they are instead formed and reformed by actors during social interaction, and this clarifies why the positivist and the phenomenological standpoints engage diverse research methods. Shakantu (2004:161) notes that in phenomenological research, data collection is in the form of words and observations, while the basis of the analysis is on the interpretation of the data rather than on figures and statistical manipulations. Figure 4.2 shows the research process from the viewpoint of the interpretivist.
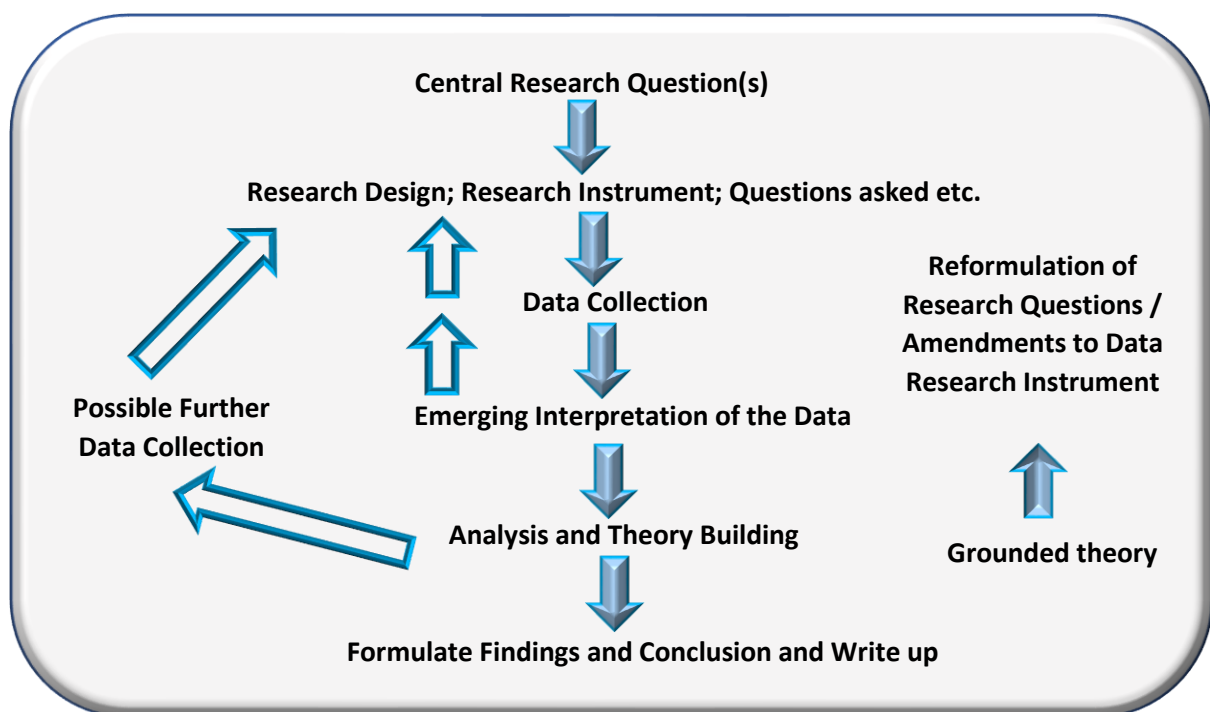
Figure 4. 2: Phenomenological (Interpretivist) View of the Research Process (Raddon 2010:14)

In their work, Easterby-Smith, Thrope and Jackson, (2008:280); Saunders, Lewis and Thornhill (2008:133) and Crossan, (2013:49-51) have emphasized the main features of the positivist and the phenomenological paradigms of the research and Table 4.1 provides a summary of these features and their implications for research.

Table 4. 1: Summary of implications and essential features of Positivism and Phenomenology

Key areas	Positivism	Phenomenology
Basic viewpoints and beliefs	The world is external and unbiased; the observer is objective, and science is value-free.	The world is socially structured and subjective; the researcher is part of the investigated sample, and human interests and motives drive science.
Method of research	Focuses on facts; looks for causality and relevant laws; it reduces the phenomenon to the barest elements and to formulate a hypothesis and to test them.	Focuses on meanings; and try to understand occurrences; look at the totality of each situation; and develop ideas through induction from data.
Research design	Structural, formal and specific detailed plans.	Evolving and flexible.
Involvement of the researcher	The researcher remains distanced from the material researched and with the only contact in the short-term.	The researcher gets involved with the researched phenomenon. Contact is long-term, with an emphasis on trust and empathy.
Preferred strategy	Execution of concepts in such a way that they can be measured.	Establishing different views of phenomena by using multiple methods.
Sampling	Large samples and randomly selected numbers.	Small samples investigated in-depth or over-time / small numbers of cases chosen for specific reasons.
Data collection methods	Experiments, surveys, organised interviews and observation.	It involves observations, documentation, open-ended and semi-structured interviews.
Research instruments	Questionnaires, scales, test scores and experimentation.	Researcher.
Strength	Provides extensive coverage of the range of situations.	Ability to look at change processes over time.

Adapted from Easterby-Smith, Thrope and Jackson, (2008); Saunders, Lewis and Thornhill, (2008); Crossan, (2013)

From the preceding, a selection of the specific research philosophy and paradigms to be used for this study emerges as shown in Figures 4.3 and Figure 4.4 and therefore, this forms the core of the discourse in the subsequent sections of the study.
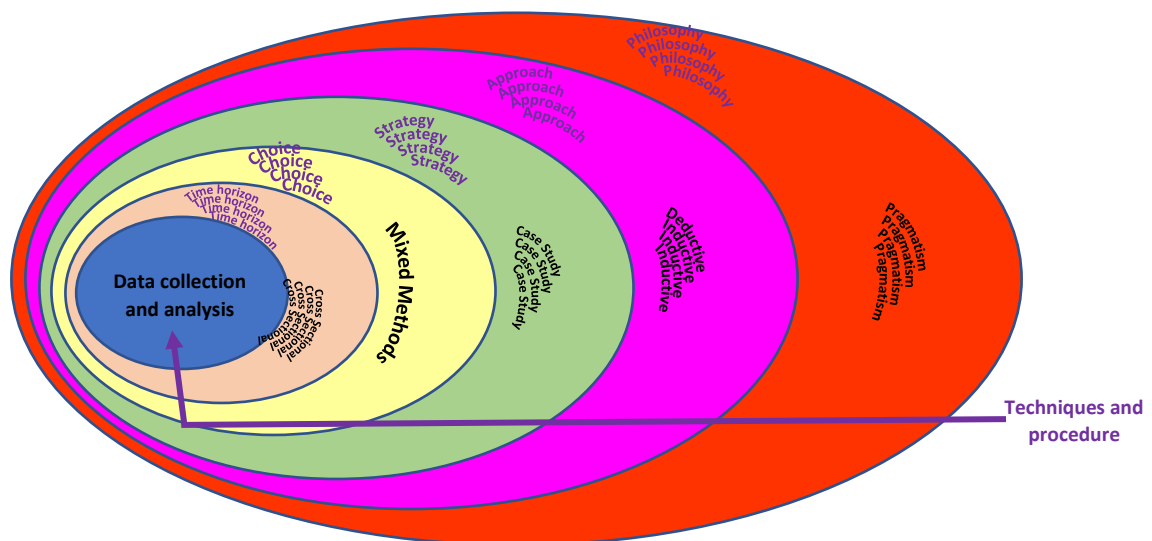
Figure 4. 3: Research "Onion" process adapted from Saunders, Lewis and Thornhill, (2008:108)
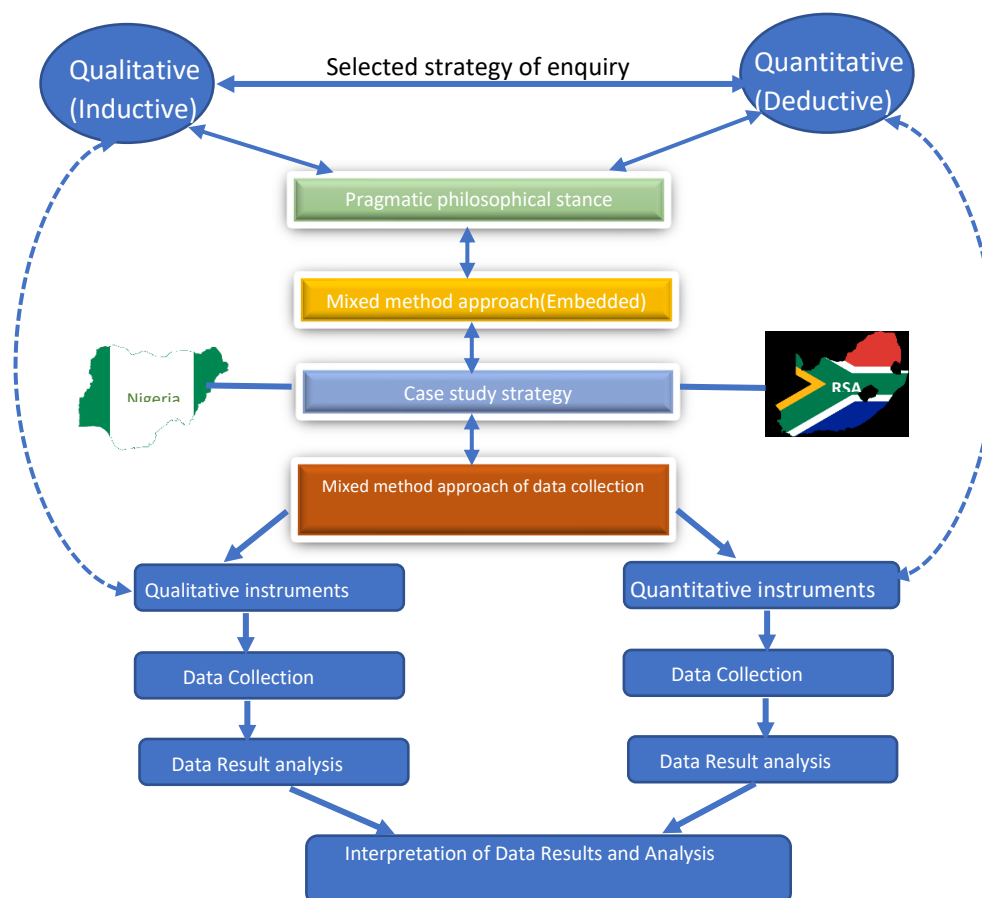
Figure 4. 4: Research Methodological Framework adapted from (Yin 2013)

4.5.3 The philosophy and the paradigm of this research

The field of construction management amalgamates highly complex, technical and social systems and it is consequently at the hub of natural and social sciences (Shakantu, 2004). The implication of this is that some aspects of positivism (natural science) and phenomenology (social science) are applicable jointly, in construction management research and can thus be synchronised. Having this in mind, the philosophical position of this research and the justification for the stance are presented in Table 4.2 and are discussed further.

The correlation between reality and theory is at the heart of science; defining the rationale for deciding why, when and if a theory can be regarded as reality (Pathirage, Amaratunga & Haigh, 2008:5). This philosophical realism and anti-realism arguments investigate the basis of a commonly accepted scientific truth. Both philosophical stances have their merits or otherwise, but the choice of a viewpoint is dependent on the context of the research.

The philosophical viewpoint adopted by this research, as shown in Figure 4.4 and Table 4.2 is pragmatic, and it rests firmly on inductive reasoning, which can be supported by positivist reasoning. The rationale is to support the deductive approach with inductive thinking, to assist it in tackling a real-life problem such as that posed by this research. However, Saunders, Lewis and Thornhill (2008) posited that there are other alternatives in research philosophy such as interpretative reasoning, realism, and positivism.

These other alternatives are shown in Table 4.3, and the most appropriate beliefs are highlighted. However, from the view of the different perceptions, particularly the interpretative approach, connected with deductive reasoning, both are influencing this research. A preference for deductive reasoning in a pragmatic approach seems advisable.

This follows the summarised characteristics of interpretative reasoning (Creswell, 2014a; Oates, 2006; Saunders, Lewis & Thornhill, 2008) as shown.

Table 4. 2: Research Philosophy Perspectives and Research Stance

Research Philosophy	Perspectives	This Research Stance
Ontology	Objectivism (External Interactions); Constructivism (Internal Interactions).	Both Constructivism and Interpretivism underscore the investigation of real-life events, within the perspective of the phenomenon.
Epistemology	Positivism – the observer, is independent of the observed; Interpretative - observer is dependent on the observed, which infers a social phenomenon.	The researcher intends to explore events that involve people, their understanding and comprehension of the phenomenon in a real-word situation.
Axiology	Value-free; Value Biased / laden.	The researchers' views are dependent on the belief, experiences as well as the skills of the participant in situations, hence it is value-laden.
Pragmatism	Neither positivism nor interpretative but a blend of both, to tackle a social issue.	More interpretative than positivist because a real-life problem requires an applied solution.

Source: Authors construct

4.6 Research Reasoning

Another dimension of research is reasoning from a research point of view, which has been posited earlier to be genuinely motivated by the philosophical stance of the researcher. Sutrisna (2009:52) has opined that reasoning derived from research denotes the logic of the research, the position of the existing body of knowledge gathered in the study of literature and the approach towards data collection and its analysis.

Reasoning research is based on the connection between the researcher with specific approaches and methods for collecting and analysing data. A research project based on reasoning can be empirical, non-empirical or a mixture of the two.

Empirical research requires empirical evidence which must be taken from data obtained from observation and or experience. It relates to whether the motivation of the research rests on developing or testing theories. Deductive, inductive, abductive and retroductive reasoning are the types of approaches behind the reasoning approach.

Table 4. 3: Research Philosophy Perspectives and Research Stance

Paradigm	Ontology (What is the reality?)	Epistemology (How can I know reality?)	Axiology (What approach can I use in knowing?)	Methodology (How do I go about finding out?)	Method (What techniques do I use to find out?)
Positivism	There is a single reality or truth.	Reality can be measured, and hence, the focus is on reliable and valid tools to obtain this.	The research is value-free hence independent of the data procuring method and the objects examined in the analysis of the data.	Experimental research (qualitative). Survey research (quantitative).	Usually, quantitative (mono-method). Could include sampling, measurement and scaling, statistical analysis, questionnaire, focus group interviews.
Constructivist / Interpretative	There is no single reality or truth. Individuals and groups create reality.	Therefore, reality needs to be interpreted to discover the underlying meaning of events and activities.	The research is value bound; such that the researcher is considered as part of the study sample, not isolated from the object studied and will be subjective.	Qualitative - Ethnography, Grounded Theory, Action Research, Discourse, Feminist Standpoint Research.	It is usually in mixed or in multiple-qualitative interview, observations, participant and no participant case study, life history, narrative theme identification.
Pragmatism	Reality is continuously renegotiated, debated, interpreted in the light of its usefulness in new, and in unpredictable events.	The best method is one that solves problems, i.e. objective or subjective meanings to provide facts and help interpret data.	Values play a vital role to interpret results using subjective and objective reasoning.	Mixed methods. Design, based on research and Action research.	Mixed or multiple methods.
Realism	The researcher is objective and exists independently of the human mind but interpreted out of a social situation.	The belief that observing an event proves the credibility of facts; scarce data or facts creates imprecision and misinterpretations focus only within context or contexts for explanations.	The research is value-laden; hence, the bias of the researcher is based on worldviews, culture, values, experiences and will affect the results / research.	Research matter determines the approach adopted.	Research problem determines the Method to use.
Subjectivism	Reality is what we perceive to be real.	All knowledge is a matter of perspective	Value-laden: postmodernism, structuralism, post-structuralism	Critical discourse	Literary analysis, intertextuality etc.
Critical	Realities are socially constructed, and they are under the constant internal influence.	Reality and knowledge are socially constructed and influenced by power relations from within the society.	Value-laden.	Critical discourse analysis, ideology critique, critical ethnography action research.	Ideological review, open-minded interviews, journals, open-ended questionnaires, open-ended observations etc.

Adapted from Crotty (1998), Easterby-Smith, Thrope & Jackson, (2008); Scotland, (2012)

Deduction begins with theories (i.e. seeking an answer to a question) while induction moves towards building a theory (seeking a question to answer).

Positivist views influence deductive reasoning, while interpretivist views influence inductive reasoning (Eriksson & Kovalainen, 2008:21).

4.6.1 Deductive reasoning

Deduction repositions from a universal theory to a specific inference (Márquez, 2007:32; Babbie, 2013:22). In the deductive approach, researchers start with abstract thinking, advance a logical relationship among concepts, progress toward concrete empirical evidence, and then finally test the ideas against the evidence 'hard data' (Neuman, 2014:29). Deduction aims at assessing whether a specific pattern occurs as predicted or not (Babbie, 2013:22) or to see if the data collected backs the generally acknowledged theory.

Blaikie (2010:85) outlined the following steps as involved in deductive reasoning:

1) Generation of tentative hypotheses that produce a theory;
2) Inferring likely conclusions stemming from the hypotheses;
3) Expounding the conclusions and the logic of surrounding opinions;
4) Examining the conclusion by gathering appropriate data and analysing the data systematically; and then,
5) The result of the test validates the theory or otherwise.

4.6.2 Inductive reasoning

This approach commences with general observations of the object of the study and it moves toward a more abstract generalisations and ideas (Neuman, 2014:30). Thus, inductive reasoning moves from specific observation to developing a general principle (Babbie, 2013:21; Márquez, 2007:32). Neuman (2007:30) summarised that researchers exploring the use of an inductive approach might pursue the following steps:

1) draw up a topic and a few vague perceptions;
2) make observations, redefine concepts, identify and develop preliminary correlations;
3) empirical generalisations; and
4) ultimately build up the theory from the ground up.

4.6.3 Retroductive reasoning

Retroduction is a mode of analysis which studies events concerning what may have, must have or could have caused them, that is asking why events have happened in the way they did (Allana & Clark 2018:8). The definition portrays a retroductive reasoning approach to "working from the data to an explanation." Initially, there is a provision of sufficient description of the regularity to be explained, with an investigation of the characteristics of the context under study, while considering any opposing mechanisms. The researcher is interested in unearthing the structures and the mechanisms that explain the observed regularities (Blaikie, 2010:87; Lawson, 2010:339-340)

4.6.4 Abductive reasoning

Abduction is an inferential process that involves reasoning used to mentally derive causal claims (that is hypotheses / theories) from premises (Lawson, 2010:338). Abductive reasoning combines what the inductive and deductive research strategies seem to ignore; the meaning and the interpretations, the reasoning and the purposes that people use in their everyday lives which then influences their behaviour and elevates them to a central place in research regularities (Blaikie, 2010:89).

4.6.5 Research reasoning of this study

This study is about understanding management principles for the sustainability of human settlements and after that, developing a model for the management of human settlement management but it is not about relationships. Deductive reasoning allows for this and provides a more profound understanding of phenomena, which is the primary goal of this research. Thus, a deductive reasoning approach is applicable to further confirm the inference drawn in Section 4.4.3. The research reasoning has a direct influence on the data collection approach and hence, the discussion proceeds in the next section.

4.7 Research Methods

The discipline of research or body of knowledge applies specific established techniques in carrying out scientific research. As a convention, quantitative data requires a quantitative approach or method, and qualitative data requires a qualitative approach or method in the collection and subsequent analysis of data (Sutrisna, 2009:54). These relate very much to the

paradigm of research. Therefore, the following sections provide an overview and discussions of these methods and approaches towards the research.

4.7.1 Quantitative research approach

The quantitative research approach is also often referred to as the traditional approach (Leedy & Ormrod, 2015:95). Quantitative research employs quantitative methods for data collection and analysis, and stresses the importance of basing research on systematic techniques and methods employed in the natural sciences. The approach focuses on the process of testing hypotheses (Pathirage, Amaratunga & Haigh, 2008:4). The quantitative research method seeks to gather factual data and study relationships between facts. The analysis of quantitative data produces quantitative results and inferred conclusions from the evaluation of these results, based on theory and literature. Sutrisna (2009:54) contends that the quantitative approach places the researcher as an unbiased observer of the phenomena in question, to maintain impartiality from the research subject. A quantitative researcher endeavours to split and delimit phenomena into applicable, quantifiable classes and to this end, the researcher's style involves the use of harmonised measures, in order to accommodate the contrasting views and experiences of people, in a restricted number of predetermined response classes to which numbers are assigned (Patton, 2002:2–48). In doing this, the quantitative researcher must construct and administer an instrument in a standardised manner in line with predetermined procedures, and he must ensure that the instrument measures what it is supposed to measure and that it does not deviate. The significance of this test is to ensure the reliability or the repeatability of the results.

There are different levels for the empirical measurement of data, namely nominal, ordinal, interval and ratio levels. The nominal scale is universal, due to the possibility of assigning values to objects, people and events, regarding the characteristics they share (Blaikie, 2010:206). There are several strategies for conducting quantitative research which include; survey, developmental design study, correlation research study, observation study, experimental, quasi-experimental and ex-post-facto design (Struwig, Struwig & Stead, 2001:7; Leedy & Ormrod, 2015:179-183)

4.7.2 Qualitative method and approach

The qualitative method is inductive and flexible. The main feature of this method gives the researcher an exceptional ability to inquire further into responses or observations, as required.

Consequently, it enables the researcher to obtain more thorough descriptions and accounts of experiences, behaviours, and beliefs (Guest, Namey & Mitchell, 2012:21). Qualitative methods have been deemed capable of studying complex situations, especially research involving human beings, as they yield rich findings (Sustrisna, 2009:54). The qualitative approach assumes that there is no single objective reality and that the observed reality is related to the researcher's interaction with the phenomenon (Sustrisna, 2009:54). Thus, qualitative research naturally emerges from the phenomenological and from the interpretivist or constructivist paradigm. While the qualitative approach depends on the underlying phenomenological philosophy; enjoying comprehensive interview and observation, the quantitative approach relies on the positivist paradigm; enjoying the rewards of both numbers and words. This suggests that such methods as interviews and observations are dominant in the naturalist (interpretivist) paradigm and supplementary to the positivist paradigm.

4.7.3 Mixed method or approach

The view as expressed by Sandelowski, Voils and Knafl (2009:208) shows that recent research has called for more precise explanations of the "foundational assumptions, judgments, and compromises involved in converting qualitative into quantitative data." Sandelowski, Voils and Knafl, (2009:211) further stated that a mixed-method approach - that is, the application of multiple methods - is ideal for addressing this call, as it "enables the fusion or the merger of data sets, not merely their juxtaposition with each other or parallel use," when converting qualitative data into quantitative data. A mixed-method approach addresses some of these concerns of the qualitative and quantitative approaches, as it merges the two methods, thereby providing greater access to data (see Table 4.4). A mixed-method approach also permits the inductive extension or development of constructs and provides prospects to explore topics for which response rates are less than ideal, in certain situations or in contexts in which traditional data sources are challenging to come by (Williams & Shepherd, 2017:270).

Creswell and Clark (2017) developed a typology of mixed methods designs, which they describe as being functional and parsimonious, and which identifies four main types of mixed methods research namely triangulation, the embedded design, explanatory and exploratory. The embedded design, first described by Caracelli and Greene (1997), is characterised by having one dominant method, whereas the other data set provides a secondary or supportive role. The embedded experimental model is the most common variant of the embedded design,

and the priority is given to the quantitative methodology, and the qualitative data set is subservient (Doyle, Brady & Byrne, 2009: 182).

4.7.4 The research approach of the study

A mixed method approach (embedded design) was adopted for this study. The norms underlying the quantitative and the qualitative approaches to research represent the two extremes of the data continuum.

While the quantitative approach is related to the deductive-objective-generalising domain, there is a link between qualitative approach and the inductive-subjective-contextual domain (Sustrisna, 2009:55).

Table 4. 4: The Research Methods and their utilisation

	Quantitative Method	Qualitative Method	Mixed Method
Mode of Approach	**Predetermined** - Tests or validates theories - Identifies variables to study - Relates variables to hypotheses - Uses standards of reliability and validity - Observes and measures information numerically	**Emerging** - Focuses on a single phenomenon to enable an in-depth study - Brings personal values into the study - Studies the context or the setting of the participants - Collaborates with the participants	**Both predetermined and emerging** - Employs both quantitative and qualitative procedures - Develops a rationale for combining the two procedures - Integrates data at different stages of enquiry
Questionnaire design	Structured questions	Unstructured	Both structured and unstructured
Types of data	- performance - Attitude - Observational - Census	- Interviews - Document - Audio visual	Multiple forms drawing on all possibilities
Analysis	Statistical	Text and image	Combines both the statistics, and the text and it could use the image if need be
Inquiry Strategies	- Experimental - Non-experimental	- Narratives - Ethnographies - Grounded theory - Case studies	- Sequential - Concurrent - Transformative
Strength	- Representativeness - The possibility of impartial disproof - Control (rigour)	- Holistic and detailed - Reactivity - Naturalism	- Combines the strength of both
Weakness	- Limited scope - Artificiality	- Non-representative - Lack of control of bias	- None

Source: Adapted from Creswell, (2003), Leedy and Ormrod (2010:96) and Miller and Brewster (2003:327).

Usually, however, research problems do not connect with the assumptions of these methods or approaches. To a degree, research problems are better understood by mixed methods (Williams & Shepherd, 2017:270) because they benefit from the advantages associated with other methods, while at the same time, avoiding the weaknesses of each (see Table 4.4). Brewer and Hunter, (2006:4) giving credence to the adoption of mixed methods in research argue that the fundamental objective of a mixed method is to "attack a research problem with an arsenal of methods that have no overlapping weaknesses, in addition to their complementary strengths."

When employing this method, research gains from a world view of social reality which incorporates the conventions underlying both methods, the researcher is free to use quantitative and qualitative techniques, depending on the research problem; in combination with inductive and deductive reasoning. Hence, the mixed method approach gives the researcher an opportunity for flexibility and practicality in the use of procedures for data collection and analysis. Shakantu (2004:173) stated that the multi-method approach is often labelled triangulation, that is a combination of two or more theories, data sources, methods or investigators in a study of a phenomenon to arrive at a single construct.

The mixed method is likely to give a firmer empirical base, and superior theoretical scope to research problems by tackling them from different paradigms (Brewer & Hunter, 2006:15). Again, the position of this research essentially underscores the adoption of multi-method approaches to the study, as the data quest in this research requires both qualitative and quantitative data collection approaches which can be used effectively to cover and to clarify the research question and see to the addressing of all contexts of the thesis. The basis underlying the assumptions of the multi-method is on a blend of both quantitative and qualitative assumptions, to provide a view of the nature of the social world and the nature of knowledge. This multiple world view presents the researcher with a better understanding of the issues raised concerning the management of sustainable human settlement within the study context.

The choice of the qualitative aspect of mixed-methods is because of the underlying philosophical supposition that people; their behaviour as well as their experience play a significant role in this research, and the quantitative aspect because of the large amount of data and feedback it provides, the high access it allows to participants, and the low cost involved. Furthermore, the researcher will be able to garner information from documents, observations and questionnaires, to gain valuable data from a sample population (Buabbas & Medjdoub, 2009:363) and this variety of data allows for the triangulation of multiple data (Bell, Bryman

& Harley, 2018:364). Similarly, qualitative and quantitative sources designed to assemble information from the study under investigation include documentation, observations and questionnaires. This will offer specific stimuli for exploring the necessary data for the development of a model that will guide the sustainable management of human settlements, using Estate Management principles. To further illustrate these points; below are the elements of both quantitative and qualitative methods applied to this research.

Quantitatively, descriptive information on the management of integrated human settlement for sustainability is required. Participants (professionals within the human settlement space at all levels of government) are expected to identify and to rank the management and the sustainability dynamics in human settlements. Blaikie (2010:47) asserts that: "quantitative methods are used when the data has been collected in, or are soon to be converted into numbers for analysis. Qualitative methods are used when data is collected using words and remains in words throughout the analysis." A quantitative tool is employed to obtain this information. Data generated was analysed and interpreted using descriptive and inferential statistics. Information was also required on broader issues such as the incidence of compliance with standard guides, regulations, codes and policies regarding physical features of human settlements. This provided evidence to support a generalisation about human management practices. Qualitatively, the research tends to produce rich and subjective data, due to the level of involvement of the researcher in the data gathering process. For example, data is required comprising opinions, explanations and perceptions of different aspects of human settlement management, within the case countries. These require the use of a qualitative tool such as observations. The case study approach, therefore, fits well with this research, due to the qualitative nature of this data (the justification for the case study adopted for this research is discussed in subsequent sections).

4.8 Strategies for Conducting Research

To provide acceptable answers to the problems and the sub-problems of research, various research strategies that may be employed include case studies, ethnography, a phenomenological study, grounded theory study, content analysis, conceptual study, surveys, historical research, action research, exploratory research, experimental studies, quasi-experimental studies and descriptive studies (Struwig, Struwig & Stead, 2001:7; Neuman, 2014:71; Leedy & Ormrod, 2015:135-142). Some of the common strategies are discussed below.

4.8.1 Experimental research

This involves the creation of an experiment, and it is commonly found in pure scientific research. Experimental research involves the treatment of objects (people, animals, plants, places etc.) in a defined way and evaluating the outcome to determine how the treatment influenced the objects and why there was a certain effect (Thomas, 2011:513).

4.8.2 Survey research

Where large volumes of data are involved with quantitative methods of analysis, surveys are often used (Girden & Kabacoff, 2011:67), and that involves gathering information about a target variable collectively or within a group to come to certain conclusions (Rungtusanatham, Choi, Hollingworth, Wu & Forza, 2003:481).

4.8.3 Grounded theory

Grounded theory is an inductive approach to the study of social life. The focus of the grounded theory is to develop new theories or hypotheses, rather than testing theories (Gibbs 2012:40; Neuman 2014:70). It attempts to generate theory from the constant comparison of unfolding observations. In this regard, rather than being decided before the study, a theory is generated by observation.

4.8.4 Content analyses

Content analyses is a technique for examining information, or content, in written or symbolic material (for example pictures, movies, songs, etc.) (Neuman 2014:49). Consequently, the technique helps to discover features in the content of large amounts of information or material that might otherwise not be noticed (Neuman 2014:371).

4.8.5 Ethnography

Ethnography is a phenomenological methodology which uses observed patterns of human activity, and it stems from anthropology. It is a special kind of case study where a researcher participates in the activities of the people or the organisation being studied (Neuman 2014:435), with the intention of identifying culture, norms, beliefs, a social system or other cultural configurations (Leedy & Ormrod, 2015b:272). The concern of ethnography is to study the normal behaviour of the people in the group or the entire group, in detail in an attempt to develop an understanding of how the culture works (Bell 2010:14).

4.8.6 Phenomenological study

A phenomenological study helps to illuminate a specific phenomenon, as perceived by the actors in a situation (Larkin, Shaw & Flowers 2018: 194). Therefore, a phenomenological study brings to the fore the experiences, understanding and perceptions of individuals (about a phenomenon) from their perspectives (Creswell 2014b: 17; Leedy and Ormrod 2015a: 275).

4.8.7 Case studies

This strategy seeks to understand social phenomena within a particular setting. It focuses attention on one or a few instances of a social phenomenon (that is one thing) in detail, rather than on general behaviour (Thomas, 2011:513). It is adopted for studying an entity, an individual, a group, a program, or an event in-depth, for a defined period of time (Leedy & Ormrod, 2015b:271).

Thomas (2011:513) explained that a case study is a holistic study that analysis persons, events, decisions, periods, project, policies, institutions or other systems using one or more methods. The case study approach to research is a wrapper containing different methods (Neuman 2014:45) as it could make use of both qualitative and quantitative data.

A case study is a suitable strategy to adopt for learning more about situations that are poorly or only partially understood (Leedy & Ormrod, 2015a:272). It is a helpful strategy for scrutinising many specific details intensely (Kumar 2011:101). Hence, it helps to reveal how multiplicities of factors have interacted or interact to produce a unique characteristic of the entity being studied (Thomas 2011:512). The major weakness of the case study is that the findings cannot be generalised, primarily when only one case is used (Combs, Crook & Rauch, 2019:6; Leedy & Ormrod, 2015a:35; Nieuwenhuis, 2007:76; Thomas, 2011:514). However, the use of multiple cases can overcome this weakness of generalisation (Thomas, 2011:519; Combs, Crook & Rauch, 2019:6).

4.8.8 Strategies used in this research

Yin (2014:1) stated that the choice of design or strategy in social science research depends on three conditions, namely; the type of research question, the control an investigator has over the actual behavioural events, and the focus on contemporary as opposed to historical events. In this research, given the exploratory nature of the study, the research problem stated in section 1 and the fact that the researcher has little control over how the stakeholders would feel about

human settlement performance and management, the case-study alternative was considered appropriate for the research.

Yin (2014:14) posited that the essence and the central tendency among all types in a case study is that it tries to illuminate a decision or set of decisions, asking, "why they were taken, how they were implemented and with what result." He, therefore, posits that case studies are tailor-made for exploring new processes or behaviours. They may also have subcases embedded within them, and this may have the added advantage of allowing the researcher to have a deeper understanding of the processes and outcomes of cases.

The nature of this research requires deep understanding and an intensive study that enables the researcher to get acquainted with the study setting and win the confidence of critical stakeholders in the organisations.

The term, a case study, is broadly used as there is little consensus among authors about what constitutes a case study. Gillham (2000:1) defines it as: "a unit of human activity embedded in the real world; which can only be studied or understood in context; which exists in the here and now; and which emerges within its context, so that precise boundaries are difficult to draw."

These issues are investigated by using a case study to answer specific research questions. Babbie (2008:306) describes it as a comprehensive investigation of a single occurrence of some social phenomenon in a specific place(s), family or group. Its critical characteristic is that it confines attention to one instance of an object. Jensen and Rodgers (2001:237-239) classified case studies into five types; namely snapshots, longitudinal, pre-post, patchwork and comparative case studies.

The detailed and unbiased study of one object at a certain time is referred to as snapshot case-study, and if the research involves a qualitative and or quantitative investigation of the object at various times, it is called a longitudinal case-study: the study of one research object at various times. However, if the study of the research object is at two different times, and the time is separated by a critical event which from theory is anticipated to impact the case observations considerably, it is identified as a pre-post case-study (Jensen and Rodgers, 2001:237-239).

A patchwork case-study includes a set of multiple case studies of the same research entity, using snapshot, longitudinal and or pre-post designs, and it is designed to provide a holistic view of the dynamics of the research subject. Lastly, a comparative case study involves a set

of multiple research objects, for the purpose of cross-unit comparison, using both qualitative and quantitative data (Jensen and Rodgers, 2001:237-239).

This research was undertaken as a set of multiple case studies of the same research, using a snapshot approach. Multiple case studies follow replication, where each case constitutes a whole study reality (Pathirage, Amaratunga & Haigh, 2008:9). In this way, facts are gathered from various sources and conclusions drawn from them.

The rationale behind the multiple case studies in this thesis is that of replication. Thus, each case was selected so that it either produced similar results or for theoretically predictable reasons produced contrary results. The multiple cases in this study also underlined the complexity of the problem under investigation.

The study, therefore, focused on the case study organisations as units of analysis. In selecting the case-study organisations, certain factors were considered.

Dasgupta (2015:153)identified four main factors that relate to the selection of case study organisations as:

Relevance - which refers to the extent of suitability of the selected organisation for the purpose of the study;

Feasibility - which refers to the practicability of the research being conducted. The researcher should be able to conceptualise, plan, execute and report on the research project. The case organisation should be within reasonable reach of the researcher, in terms of distance and the researcher should have the appropriate managerial and operational support, to ensure successful completion of the project;

Access - which requires that the full co-operation of the organisation should be secured for the duration of the research. Accessibility also required that the nature of the business of the case study organisation should be non-security sensitive and that they should be willing to participate in the research at both executive and operational level; and,

Applicability - which refers to the extent to which the case study method can be applied to a situation.

In terms of relevance to this study; the case study had such characteristics as housing and human settlement; a large population and an interest in Property and Facilities Management.

In relation to feasibility; due to globalisation and the web, this gave an assurance of access to ensure the successful completion of the research. For accessibility; the co-operation of the case professionals was secured for the duration of the research.

The nature of the business and the research was non-security sensitive, and as researcher was a member of the profession of human settlement managers, securing participation was a lot easier. In relation to the applicability of the research and the extent to which the case study method can be applied, factors such as the size of the case organizations (federal / national government, state / provincial government, local / municipal government departments were considered as units of analysis) and industry sector businesses (nature of business) were considered. However, the primary defining feature of a case study is the fact that there is a multiplicity of perspectives rooted within a specific context (Snape & Spencer, 2003:52). In this research, the multiplicity of perspectives lies in the fact that the stakeholders in the study experienced the management of human settlements in different ways.

Palinkas *et al*. (2015:539) states that the case approach provides the opportunity for the investigator to apply a range of data collection techniques and to use evidence from multiple sources. Although case studies may be used in their rights, it is more often recommended as part of a multi-method approach. Their view supports the the quantitave method with strands of qualitative method adopted for this research.

A strong appeal for the case-study alternative in this study was the opportunity it provided to examine in-depth the links between the performance evaluation systems, building facilities management and organisational processes which the literature review suggested. Furthermore, the involvement of mixed data in the research pointed to the use of the case study design alternative. The research design was characterised by an iterative process using concepts and ideas from both the theoretical literature and the empirical data from the field. The structural framework for the execution of the research as adapted from Amaratunga (2000:264) is represented in Figure 4.5.

```
     Planning              Data                          Data analysis
←──────────────→|←──────────────→|←────────────────────────────────────────────→

┌──────────┐          ┌──────────────┐
│  Review  │          │ Theoretical  │
│    of    │◄────────►│and conceptual│
│literature│          │  framework   │
└──────────┘          └──────────────┘
     │                       │
     ▼                       ▼
┌──────────┐          ┌──────────────┐          ┌──────────────┐          ┌──────────────┐
│ Research │          │ Methodology /│          │              │          │   Overall    │
│questions │◄────────►│ Case studies │◄────────►│Case analysis │◄────────►│ discussions, │
└──────────┘          └──────────────┘          └──────────────┘          │ findings and │
                                                        │                  │    model     │
                                                        ▼                  │ development  │
                                                 ┌──────────────┐          └──────────────┘
                                                 │  Web survey  │◄────────►       │
                                                 │questionnaire │                 ▼
                                                 └──────────────┘          ┌──────────────┐
                                                                           │   Summary;   │
                                                                           │  conclusion; │
                                                                           │recommendations│
                                                                           │ and area(s) for│
                                                                           │further research│
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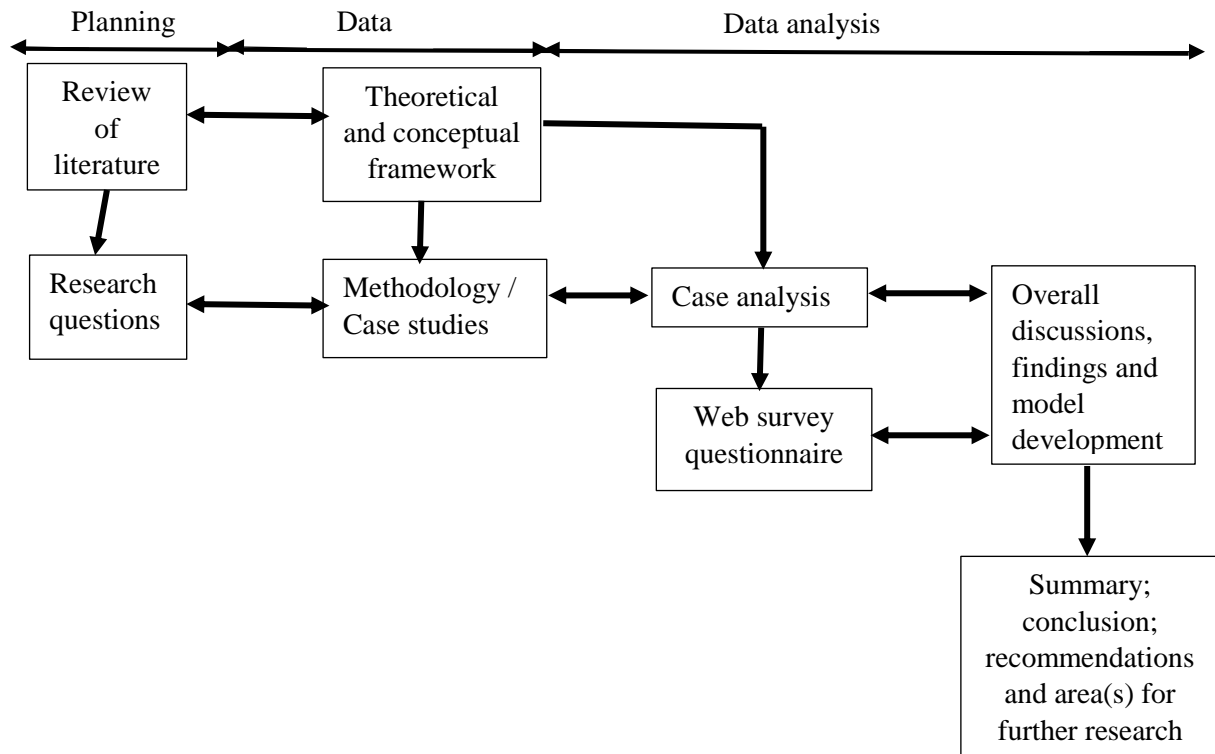
Figure 4. 5: General structure of the research design

The choice of Nigeria and South Africa as case studies for this research is premised on the economic power they wield in sub Saharan Africa as well as the volume of their housing deficit despite the various intervention of the governments of the two countries. Nigeria with its pre-colonial past and a land policy which nationalised land while vesting the governors with powers to alienate land is still faced with housing challenge in terms of quality and quantity. In addition, post-apartheid South Africa has entrenched housing as a right in its constitution and has delivered free housing through its several programmes and policies since 1994 but the housing challenge still subsists. Hence the choice of these two countries further arise from their unique past and housing policies.

4.9 Population and Sampling Technique

A study population is that collection of constituents from which a sample is selected while a sample is that element(s) considered for selection in a study (Babbie, 2008a:196). The nature of the research and the study population ultimately defines the sample selection. In this research, the population under study can be defined as all stakeholders in the management of human settlements in Nigeria and in South Africa that hence are regarded as homogenous.

The exact population of the study is unknown, and Smith (2013:1-7) gave the formula to achieve an appropriate sample for such a study as follows:

$$\text{Necesary sample size} = \frac{(\text{Z score})^2 * \text{StdDev} * 1 - \text{StdDev}}{(\text{margin of error})^2} \qquad \qquad \textit{....Equation 1}$$

Where:

required confidence level corresponds with Z score and confidence level is @ 95% (The value on the Z table at 95% confidence level = 1.96)

standard deviation is @ 0.5 (a safe decision is to use 0.5 standard deviation to ensure sufficient sample)

margin of error / confidence interval +/-5%

$$\text{Hence, the required sample size} = \frac{(1.96)^2 * 0.5 * 1 - 0.5}{(.05)^2} = \qquad 385 \text{ respondents.} \dots \textit{Equation 2}$$

Hence, the sample size for the study is three hundred and eighty-five (385) and an appropriate sampling technique was vital to balance the objectives of the study and the data requirements being a multiple case study research technique. Leedy & Ormsrod (2015a:147) opined that the identification of a sample depends on the research question to be answered. Furthermore, Blaikie (2010:166) posited that the precision of estimates of population constraints depends on the sample size and hence, the general rule applies, being; the more substantial the sample, the better. This indicates that a large sample gives a smaller sampling error, as against a small sample. Non-probability samples, sometimes called convenience samples, occur when the probability is that every unit or respondent included in the sample cannot be guaranteed to participate in the survey (Leedy & Ormrod, 2015a:211). For probability samples, the researcher selects the sample, based on some probabilistic procedure, and the individuals in the population have no control over this procedure. In contrast, a web survey may be posted on a website where it is left up to those browsing through the site to decide to participate in the survey; to ('opt-in') or not. As the name implies, such non-probability samples are often used because it is somehow convenient to do so. Purposive sampling is a non-probability technique used for this research, and it is a technique that chooses informative subjects or units of observation as a representation of the broader phenomenon under investigation. The sample frame for the web

survey was a list of records of stakeholders in the human settlement management space, who were requested to snowball the survey. The sample was considered by the researcher to have adequate knowledge and experience of the management of human settlements in the case studies.

4.10 Questionnaire Design

A questionnaire technique was utilised as it inspires independent thinking by respondents. The literature review was pivotal in the questionnaire design, as most issues arising therein birthed the need to seek further information in the field of research. The questionnaire (Appendix 2) comprised twenty-nine (29) questions which were observed as critical issues in human settlements management, and they were grouped into five (5) sections. The first section addressed the biographic data of the respondents, while the second collected information on the physical state and the characteristics of human settlements. Human settlement maintenance management was addressed in the third section, and factors influencing human settlement management were captured in the fourth section; while the fifth addressed human settlements management sustainability issues. The Likert type Scale was the preferred scaling system for applicable statements / questions, as it is the most commonly used one because of the ease of composing it. It also provides for the use of hidden attitudes and it is likely to produce a highly reliable scale (Abdullah *et al*., 2011:43). The choices of responses were divided along a scale of 1 to 5, each represented as follows, for example; 1: Strongly Disagree, 2: Disagree, 3: Undecided, 4: Agree and 5: Strongly Agree. For the purpose of marking the overall mean, the scoring system as presented in Table 4.5 from Sarrafzadeh, Martin & Hazeri (2010:205) was adopted for the decision rule in the data analysis section.

Table 4. 5: Decision rule

Mean	Decision/Interpretation
1.00 to 1.44	Strongly disagree
1.45 to 2.44	Disagree
2.45 to 3.44	Neutral / Undecided
3.45 to 4.44	Agree
4.45 to 5.00	Strongly agree

Adopted from Sarrafzadeh, Martin & Hazeri (2010:205)

Ethical clearance was sought and obtained from the Nelson Mandela University Research Ethics Board (Appendix 3), and this served as permission to administer the questionnaire. The

questionnaire was loaded on a QuestionPro® web survey (Appendix 4), which was selected primarily because of its ease of use and real-time online descriptive analysis of responses. The application proved to be cost-effective, economical, time-saving, convenient and it also safeguarded against time constraints as with other web-based survey applications, as posited by Kaplowitz, Hadlock & Levine (2004:94). Moreover, there were no anticipated problems as all respondents have email and internet facilities in their offices. Bearing in mind that the response rate for online surveys is usually low and at times below ten percent (10%) (Van Mol 2017:318), over four thousand (4000) respondents were requested to participate in the survey via email. The email contained the scope and the importance of the research study, as well as the web link to access the online questionnaire via QuestionPro®.

QuestionPro® offers a seamless survey data and analytics integration with Salesforce, Microsoft Dynamics, Table and several other global platforms with robust API that enables a complete control of survey feedback data. The software also offers comprehensive analytics features where responses are easily transmitted into graphs and easy-to-digest reports. In addition, it adapts well into mobile use allowing respondents to access it through a mobile device. It further permits multiple users to access data while the survey is active and simultaneously with one another increasing efficiency.

Reminder emails were sent to the potential respondents to encourage them to participate. The survey was closed after one hundred (100) days to allow time for data collation, and as at the time of closing, there were a total of three hundred and seventy-five (375) responses.

4.11 Data Analysis

Yin (2013:322) identified data analysis as a process that comprises the examination; classifying; organizing; or recombining of data / information with the aim of addressing the original intent of the research work. For this study, the web survey tool employed, QuestionPro®, coded both for qualitative and quantitative data. Coding is a style of retrieving and generating categories from the questionnaire's responses, interview transcripts, direct observations and documents; put into systematic patterns for meaningful interpretation and summarised into words (Saunders, Lewis & Thornhill, 2008:152; Snape & Spencer, 2003:73). After coding came an iterative reading of the responses, extracting the themes and the patterns by examining the frequencies, similarities, differences, and the relationships between the responses of the data segments.

QuestionPro® generated descriptive summary statistics for the survey results, while the Statistical Package for Social Sciences (SPSS® V21 for Windows®) was used to analyse frequency, as well as Cronbach Alpha, Kaiser-Meyer-Olkin Measure of Sampling Adequacy, Bartlett's Test of Sphericity and other statistical analysis like mean score calculations, chi-square test, Cohen's d- and Independent Samples t-Test for means. The response of participants to the survey was reasonably impressive, based on the retrieved completed questionnaire from the web survey with a completion rate of 99.25% and 80.47% respectively, for Nigeria and for South Africa. Section A dealt with the biographic details of the respondents, while section B sought to know the physical state of the human settlements and section C served with understanding the maintenance / management approach employed in the management of human settlements.

Sections D and E of the questionnaire served with understanding the respondents' perception of the factors influencing human settlements management and its sustainability. It comprised 11 questions: 2 linked to a Likert-scale format (1=strongly disagree to 5=strongly agree), with each having its own sub-questions / statements. Six were closed-ended questions, and the remaining 3 were open-ended questions. These questions were mainly drafted to ascertain the perception of the factors influencing human settlements management to answer the research question in Chapter 1 of this research. The respondents' responses were coded: strongly disagree=1, disagree=2, undecided=3, agree=4 and strongly agree=5.

The following were also indicated and used in the analysis to describe the results:

Nr= sample size,

Mean= average weighted score of responses,

df= degree of freedom.

Also, Table 4.6 illustrates the significance of interpretation intervals used for the discussion of the result of the data analysis. These intervals are universal as identified by Gravetter & Wallnau (2009:264) and are subsequently adopted for this study to identify relationships and correlations or otherwise.

Table 4. 6: Practical Significance Interpretation Intervals

Inferential Test: Statistic	Small	Moderate	Large
t-Test: Cohen's d	$0.2 <= d < 0.5$	$0.5 <= d < 0.8$	$d >= 0.8$
ANOVA: Eta squared	$\eta^2 < .09$	$.09 <= \eta^2 < .25$	$\eta^2 >= .25$
Chi² Test: Cramér's V			
df* = 1	$.10 <= V < .30$	$.30 <= V < .50$	$V >= .50$
df* = 2	$.07 <= V < .21$	$.21 <= V < .35$	$V >= .35$
df* ≥ 3	$.06 <= V < .17$	$.17 <= V < .29$	$V >= .29$
Correlation:	$.10 <= r < .30$	$.30 <= r < .50$	$r >= .50$

Source: Gravetter & Wallnau (2009:264)

4.12 Ethical Considerations

In research, addressing ethical issues such as privacy, consent, confidentiality, avoiding deceit and harm to all the participants is very vital (Morton & Wilkinson, 2008:43; Bloomberg, Cooper & Schindler, 2011:114–5; Fox & Bayat, 2011:148).

In conducting this research, the researcher was mindful of the following ethical issues:

- **Plagiarism:** The researcher acknowledges the work of others used as materials in the research work. All sources of information are identified and appropriately referenced;
- **Confidentiality and anonymity:** The individual rights to confidentiality and privacy are protected in this research. The responses and the data generated were treated with absolute confidentiality and used for academic research purposes only;
- **Compliance with the law and standards:** The research was undertaken within the grounds of and did not contravene the rules and the regulations of research at the Nelson Mandela University;
- **Honesty and trust:** The research reported and discussed the data as it is, without fabrication, or misrepresentation;
- **Integrity:** The research was conducted with sincerity; and
- **Informed consent:** The consent of the participants in this research was duly obtained.

4.13 Summary of the Chapter

This chapter presented the methodology adopted for this study, and it also provided justifications for the philosophical position and methods of data collection. The research design described in this chapter has linked three critical elements of the research methodology, namely; the underlying philosophical assumptions, the research methods or approach; and data collection techniques. Issues relating to the validity and the limitations of this research have been discussed. The next chapter presents the empirical analysis of the two (2) case studies used for this research.

CHAPTER 5: EMPIRICAL ANALYSIS OF THE TWO CASE STUDIES

5.1 Introduction

In this chapter, the researcher presents the case and the analysis of the empirical data from the case studies. This section presents the results of questionnaire surveys administered to respondents. On the Nigerian platform, QuestionPro® revealed that seven hundred and sixty-nine viewed the survey, two hundred and seventy-five started while two hundred and seventy-three completed the survey with an average completion time of eleven minutes and a completions rate of 99.25%. From the South African platform, three hundred and five people viewed while one hundred and twenty-nine started the survey and one hundred and two completed it. The completion rate was 79.84% and an average time of nine minutes. Tables, figures and charts were extensively used for data presentations, analysis and interpretation of results.

5.2 Respondents Biographic Analysis

The research study's respondents in Nigeria and in South Africa are from an array of professionals and stakeholders relevant to the management of human settlements, and this was considered appropriate within the context of the research. Hence, this section intended to establish the demography in terms of gender, age, level of education, profession, years of experience in human settlement management, the type of organisation and the level of involvement in human settlement management of the participants. The result will clearly illustrate the respondent's relevance to the study and thus will give reliability, credibility, coherence, representation and consistency to the information they provided for the research. Therefore, in the proceeding section is a presentation of information on the demography of the respondents as obtained from Section A of the questionnaire.

5.2.1 Respondents gender

Although the research study is not gender-sensitive, the question sought to reveal the gender ratio of the respondents and to establish that there was a balanced distribution in the sample when evaluated against the total population.

The combined results as shown in Table 5.1 reveal that the gender of the participants was 62.3% (233Nr) male and 37.7% (141Nr) females out of a combined total of three hundred and seventy-four (374) respondents from the two case studies. Figure 5.1 and Table 5.1 also

illustrate the breakdown of the gender of the respondents by country, Nigeria has 64.1% (175 Nr) and 35.3% (97Nr) male and female respondents respectively and one invalid, while South Africa has 56.9% (58Nr) and 43.1% (44Nr) male and female respondent, respectively. In support of this result is the International Labour Organisation (ILO) (2018:7) statistics figure on labour force participation by sex in Sub-Saharan African which reveals 74% males and 64.7% females hence supporting the result of more male than females in the human settlement management sector.

Table 5. 1: Gender of respondents.

Gender	Nigeria		South Africa		Combined		
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Valid Percent
Male	175	64.1	58	56.9	233	62.1	62.3
Female	97	35.5	44	43.1	141	37.6	37.7
Total	272	99.6	102	100.0	374	99.7	100.0
Missing	1	0.4	0	0	1	0.3	
Total	273	100.0	102	100.0	375	100.0	

Source: Researcher's Field Survey (2019)
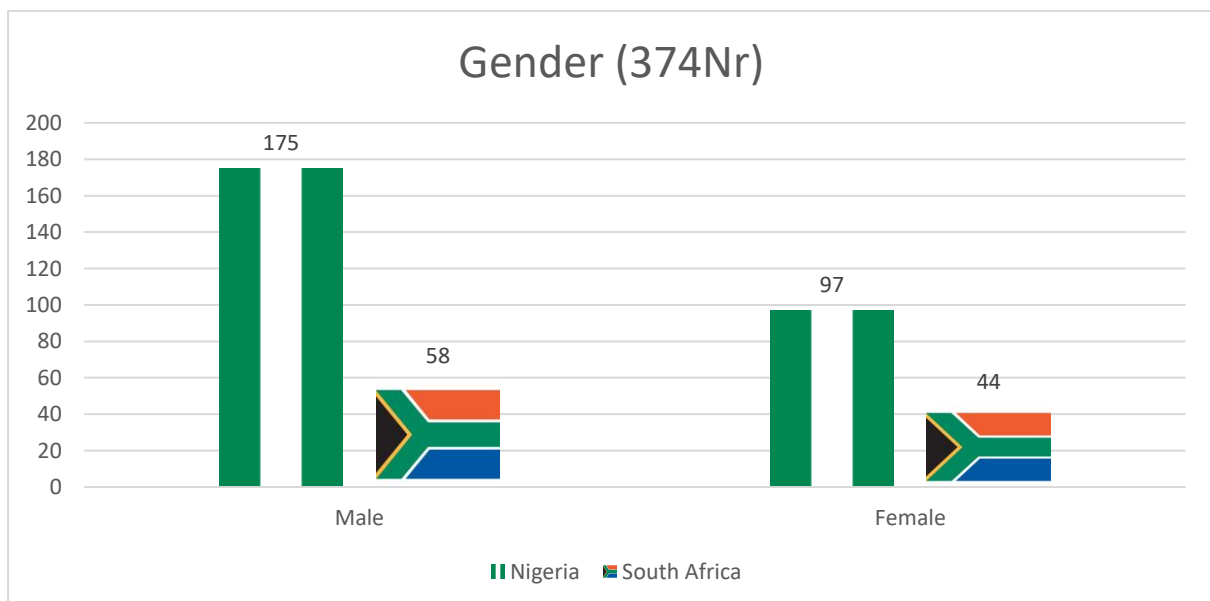
Figure 5. 1: Gender of respondents

Source: Researcher's Analysis of Data (2019)

5.2.2 Respondents age

The age question was to ascertain the age range of the study participants and to validate whether they were within the economically active groups of the economy.

The outcome of the analysis shown in Table 5.2 and Figure 5.2 confirms that 12.3% (46 Nr) were within the age group eighteen to thirty (18 to 30), while 44% (165 Nr) were within the age group of thirty-one (31) to forty-five (45) and 41.1% (154 Nr) were within the age group of forty-five (45) to sixty (60). Furthermore, 2.4% (9 Nr) were over sixty (60) years old. These figures revealed that of the respondents sampled, over 95% were within the productive age groups in the two economies (Nigeria and South Africa) which was specified as from the ages eighteen to fifty-five (18 to 55) by OECD (2019, Online). Ages naught to eighteen (0 to 18) years are in the dependency age group while people aged fifty-five to sixty-four (55 to 64) (those who are passing the peak of their careers and approaching retirement). However, for the two case studies, it shows that the age ranges of the respondents were between thirty-one to sixty (31 and 60). In a breakdown of each case study, Table 5.2 shows that the age range of forty-six to sixty (46 to 60) accounts for the higher percentage of 47.3% (129 Nr) closely followed by the age range of thirty-one to forty-five (31 to 45) at 38.1% (104 Nr) for Nigeria. Also, in South Africa, the age range of thirty-one to forty-five (31 to 45) account for 59.8% (61 Nr) whereas the age range of forty-six to sixty (46 to 60) years accounts for 24.5% (25 Nr). These show that there is no significant difference in the age distributions of the two case studies.

Table 5. 2: Respondents age

Age	Nigeria		South Africa		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
18-30	33	12.1	13	12.7	46	12.3
31-45	104	38.1	61	59.8	165	44.0
46-60	129	47.3	25	24.5	154	41.1
Above 60	6	2.2	3	2.9	9	2.4
Total	272	99.6	102	100	374	99.7
Missing	1	0.4	0	0	1	0.3
Total	273	100.0	102	100	375	100.0

Source: Researcher's Field Survey (2019)
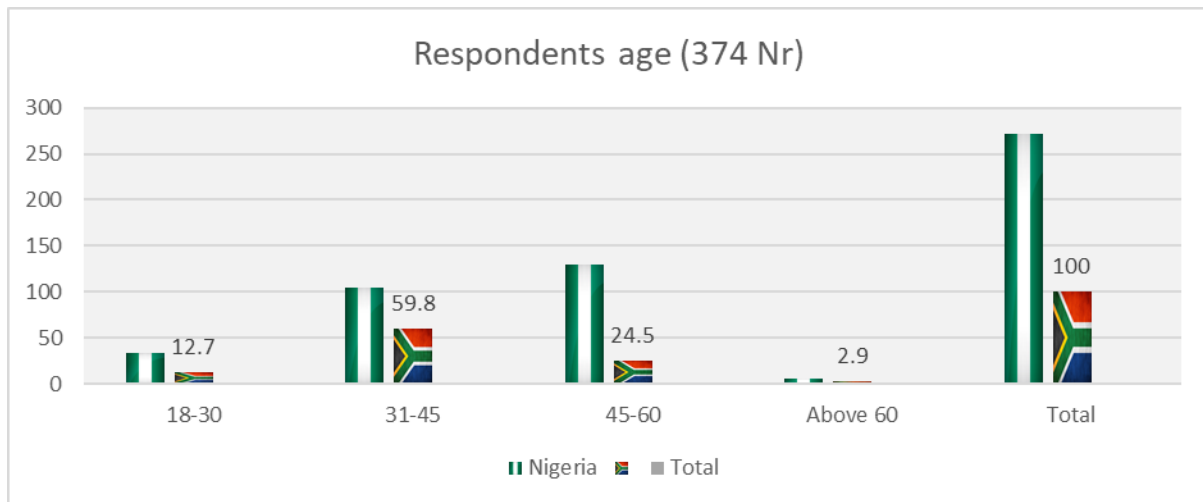
Figure 5. 2: Age of respondents

Source: Researcher's Analysis of Data (2019)

5.2.3 Respondents education level

This question in the biographic information section seeks to identify the respondent's education level. Table 5.3 indicates that there was a missing value of 1.9% (7 Nr). None of the respondents lacked formal education while 1.3% (5 Nr) had attended or obtained High School or Matric or Senior Secondary Certificate or Technical and Vocational Training and 15.7% (59 Nr) had Diplomas and Undergrad. Degrees. Furthermore, 61.1% (229 Nr) had either Honours (South Africa) or BSc (Nigeria), and 20% (75 Nr) had either a master's degree or a PhD.

A further breakdown by individual case study, as illustrated in Table 5.3 showed that 71.8% (196 Nr) of the Nigerian respondents have a BSc degree while 22% (60 Nr) have Masters / PhD. Of the South African respondents, 48% (49 Nr) have obtained Diplomas and Undergrad Degrees, 32.4% (33 Nr) have Honours, and 14.7% (15 Nr) have Post Graduate Degrees, either Master's or PhDs.

These findings validate the research context that showed that the data supplied is relevant, trustworthy, descriptive and convincing, as a significant proportion of the participants have essential education and can relate to the issues under investigation.

Table 5. 3: Education Level of respondents

Education Level	Nigeria		South Africa		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
No formal education	0	0	0	0	0	0
High School / Matric / SSCE / TVET	2	0.7	3	2.9	5	1.3
Diploma / Undergrad Degree	10	3.7	49	48.0	59	15.7
Honours / BSc (Nigeria)	196	71.8	33	32.4	229	61.1
Masters / PhD	60	22.0	15	14.7	75	20.0
Total	268	98.2	100	98.0	368	98.1
Missing	5	1.8	2	2.0	7	1.9
Total	273	100.0	102	100.0	375	100.0
Source: Researcher's Field Survey (2019)						
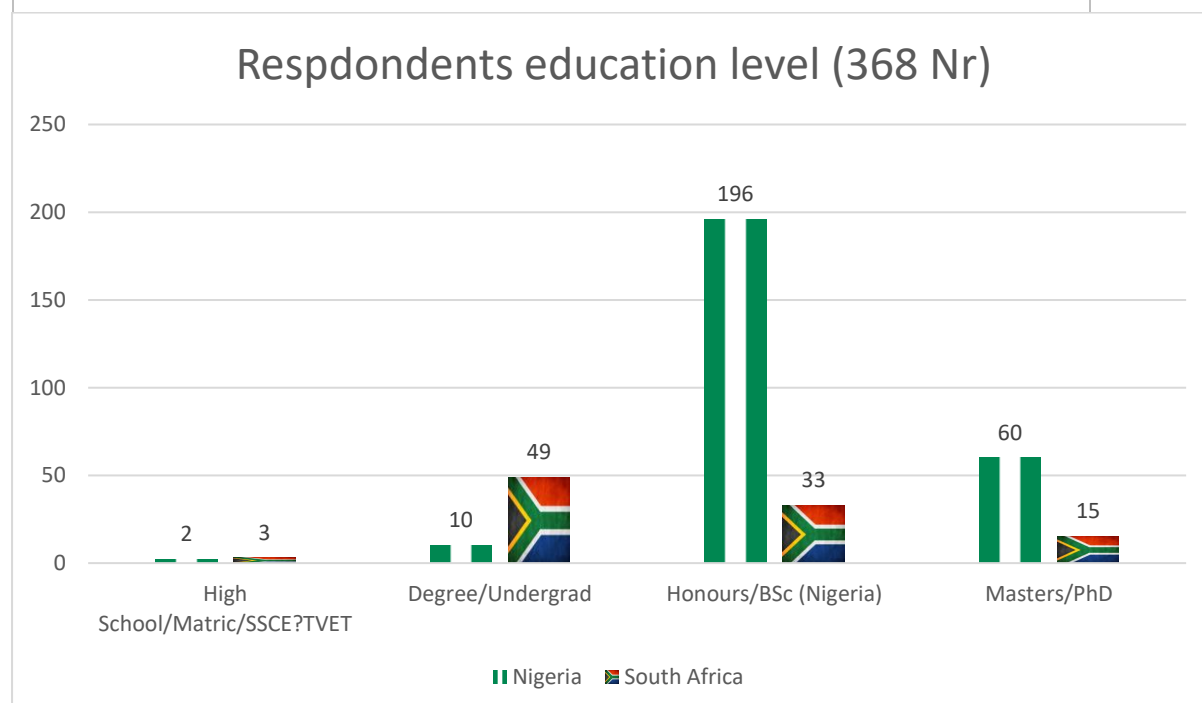
Figure 5. 3: Respondents' education level

Source: Researcher's Analysis of Data (2019)

5.2.4 Respondents profession

Respondents were asked to indicate their occupation in order to verify the credibility and reliability of the information they provided for this study. It was also to confirm whether a significant percentage of the respondents are trained or skilled enough to serve as managers of human settlements or whether they have substantial understanding, skill, awareness and knowledge of the object of the study.

The results from Nigeria has a missing value of 14.3% (39 Nr) and as presented in Table 5.4 and Figure 5.4 this indicates that 64.8% (177 Nr) of the respondents are Estate Surveyors and Valuers / Facility or Property Managers, while lawyers / company secretaries account for 2.6% (7 Nr).

Other allied professions such as Architects and Quantity surveyors accounted for 1.8% (5Nr) each; Mechanical engineers, Project managers, Surveyors and Town Planners also accounted for 0.7% (2Nr) each. It is interesting to note that these are the professions charged with the responsibility of the management of the human settlements.
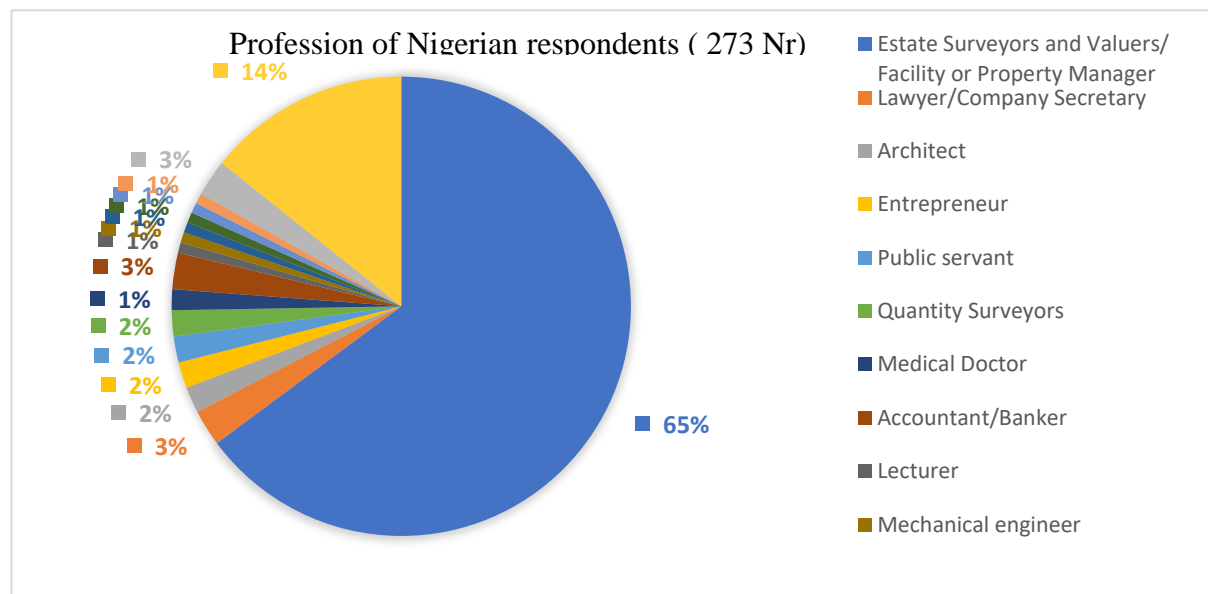
Figure 5. 4: Profession of Nigerian respondents

Source: Researcher's Analysis of Data (2019)

Table 5. 4: Profession of Nigerian respondents

Profession	Frequency	Percentage
Estate Surveyors and Valuers / Facility or Property Manager	177	64.8
Lawyer / Company Secretary	7	2.6
Architect	5	1.8
Entrepreneur	5	1.8
Public Servant	5	1.8
Quantity Surveyors	5	1.8
Medical Doctor	4	1.5
Accountant / Banker	7	2.6
Lecturer	2	0.7
Mechanical Engineer	2	0.7
Pensioner	2	0.7
Project Manager	2	0.7
Surveyor	2	0.7
Town Planners	2	0.7
Others	7	2.6
Missing	39	14.3
Total	**273**	**100**

Source: Researcher's Field Survey (2019)

However, in South Africa, also with a missing value of 12.7% (13 Nr) as shown in Table 5.5 and Figure 5.5, Property Managers and Agents accounted for 28.4% (29 Nr) while allied professions in the built environment such as Town Planner / Building Inspector, Quantity Surveyor, Construction or Project manager and Civil Engineer account for 7.8% (8 Nr) each.

Administrators are at 6.9% (7 Nr) and Accountants or Auditors are at 3.9% (4 Nr) while Municipal Managers, Lawyers and Academics represent 3% (2 Nr) each. Ward Councillor / Community reps and Land Surveyors represent 1% (1 Nr) each and others such as sociologists, social scientists, Director: Retail, Electricity and Energy and Technical controller are at 5.9% (6 Nr).

Table 5. 5: Profession of South African respondents

Profession	Frequency	Percent
Property Manager and Agent	29	28.4
Town Planner / Building Inspector	8	7.8
Quantity Surveyor	8	7.8
Construction or Project Manager	8	7.8
Civil Engineer	8	7.8
Administrators	7	6.9
Accountant or Auditor	4	3.9
Municipal Manager	3	2.9
Lawyer	3	2.9
Academic	3	2.9
Ward Councillor / Community Rep.	1	1.0
Land Surveyor	1	1.0
Others	6	5.9
Missing	13	12.7
Total	**102**	**100.0**

Source: Researcher's Field Survey (2019)
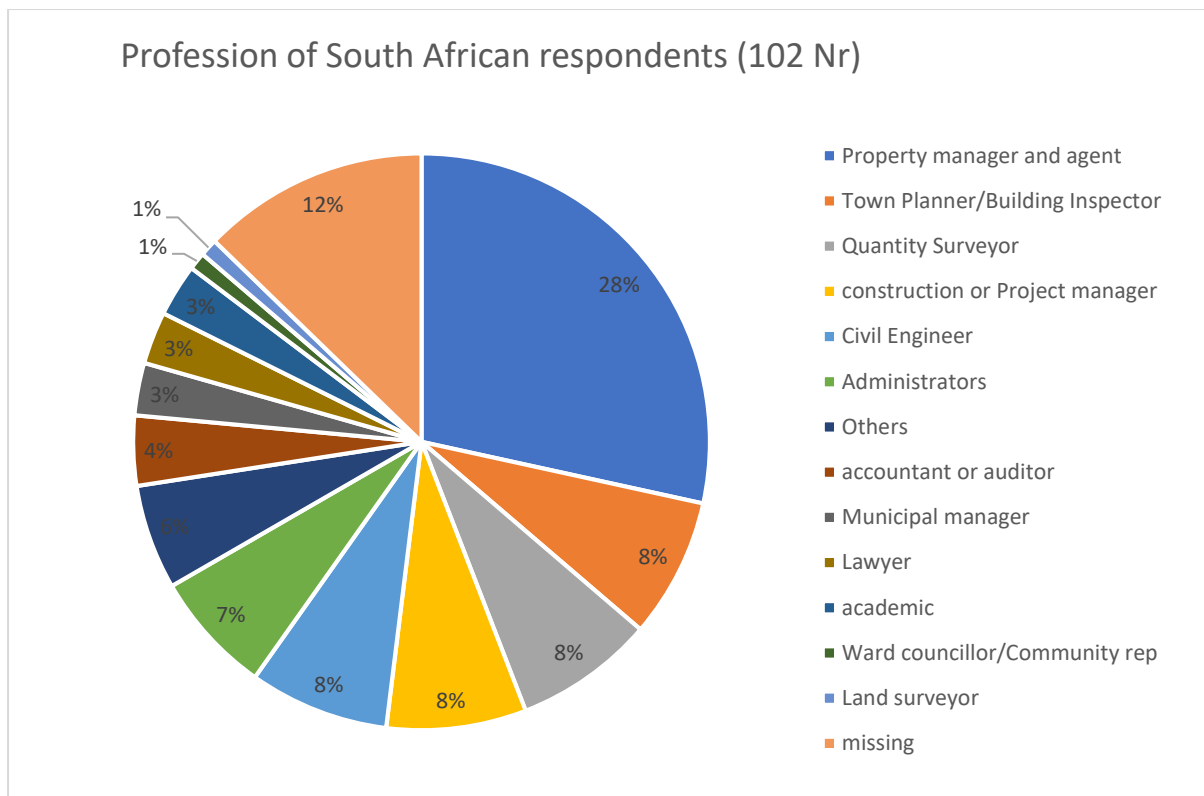
Figure 5. 5: Profession of South African respondents

Source: Researcher's Analysis of Data (2019)

5.2.5 Respondents year of experience in human settlements management

It is vital that the experience of the respondents in the study demonstrated and justified that they have significantly participated in the management of human settlements.

With a missing value of 1.6% (6 Nr), the quantitative results shown in Table 5.6 and Figure 5.6 showed that 49.6% (186 Nr) of the respondents had between one and ten (1 and 10) years' experience, whereas 34.9% (131 Nr) had between eleven and twenty (11 and 20) years' experience, and 10.4% (39 Nr) had within twenty-one to thirty (21 to 30) years of experience. However, 1.9% (7 Nr) of the respondents had an experience level above thirty (30) years, and only 1.6% (6 Nr) had less than one (1) year' experience.

These results show that at least 96.8% of the respondents had a minimum of one (1) year experience in human settlement management units, as compared with 3.2% who had no experience (missing value) or less than one (1) year experience. The 3.2% represents respondents who are community representatives or are members of the landlord tenant's

association. This illustration gives credence to Tables 5.4 and Table 5.5, as well as Figures 5.4 and Figure 5.5, where over 60% of the respondents are employed actively in the management of human settlements.

Table 5. 6: Year of experience in human settlements management

Years of experience in human settlements management	Nigeria		South Africa		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Less than 1 year	5	1.8	1	0.98	6	1.6
1-10 years	106	38.8	80	78.43	186	49.6
11-20 years	116	42.5	15	14.71	131	34.9
21-30 years	37	13.6	2	1.96	39	10.4
Above 30 years	6	2.2	1	0.98	7	1.9
Total	**270**	**98.9**	**99**	**97.06**	**369**	**98.4**
Missing	3	1.1	3	2.94	6	1.6
Total	**273**	**100.0**	**102**	**100**	**375**	**100.0**

Source: Researcher's Field Survey (2019)
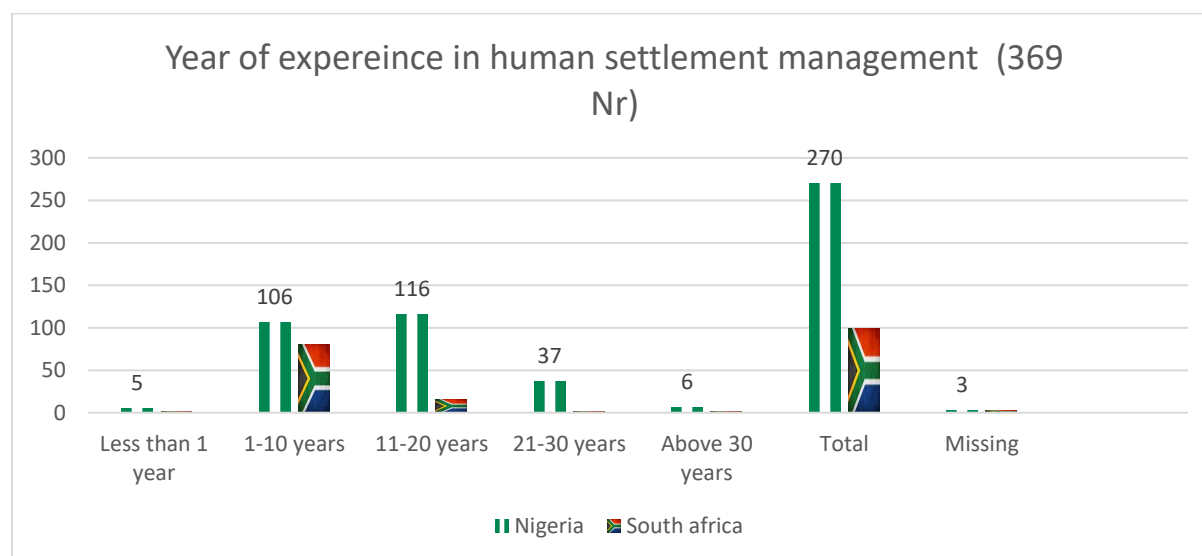
Figure 5. 6: Years of experience in human settlement management

Source: Researcher's Analysis of Data (2019)

5.2.6 Respondents organisation

This question seeks to validate and to support that the information provided by the respondents is reliable. It also aims to establish the percentage of the respondents who work or serve in private or public organisations identified for this study and hence underpin whether the respondent's awareness, knowledge and understanding of the subject of investigation of the study is acceptable. The results in Table 5.7 revealed that of the three hundred and seventy-five (375) respondents, 45.6% (171 Nr) work as private professionals or contractors, while 11.5% (43 Nr) work at the Local or municipal governance level and 16% (60 Nr) of the respondents work with the State Housing Corporation or the Provincial Department of Human Settlement. 10.9% (41 Nr) work with the Federal Housing Authority or the National Department of Human Settlements, whereas 7.7% (29 Nr) are designated community representatives while 1.9% (7 Nr) respondents do not have applicable work and are considered as a resident or tenant.

These findings revealed that at least 96% of the respondents' work in the relevant organisations and support the research perspective that the data provided is appropriate, descriptive and reliable. It also gives confidence to the over 60% of study participant claiming to be professionals and allied professionals, in the built environment (see Table 5.4 and Table 5.5) and the 95% who were also asserting to have a minimum of one (1) year experience in the issue under investigation (see Table 5.6) and working towards becoming professionals who would be knowledgeable about the subjects of the research.

Table 5. 7: Type of organisation

Type of Organisation	Nigeria		South Africa		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Private Professionals / Contractors	136	49.8	35	34.3	171	45.6
Local/Municipal	17	6.2	26	25.5	43	11.5
State Housing Corp / Provincial DHS	37	13.6	23	22.5	60	16.0
Fed. Housing Authority / National DHS	40	14.7	1	1.0	41	10.9
Community Representative	25	9.2	4	3.9	29	7.7
Others	5	1.8	2	2.0	7	1.9
Missing	1	0.4	1	1.0	2	0.5
Total	273	100.0	102	100.0	375	100.0

Source: Researcher's Field Survey (2019)
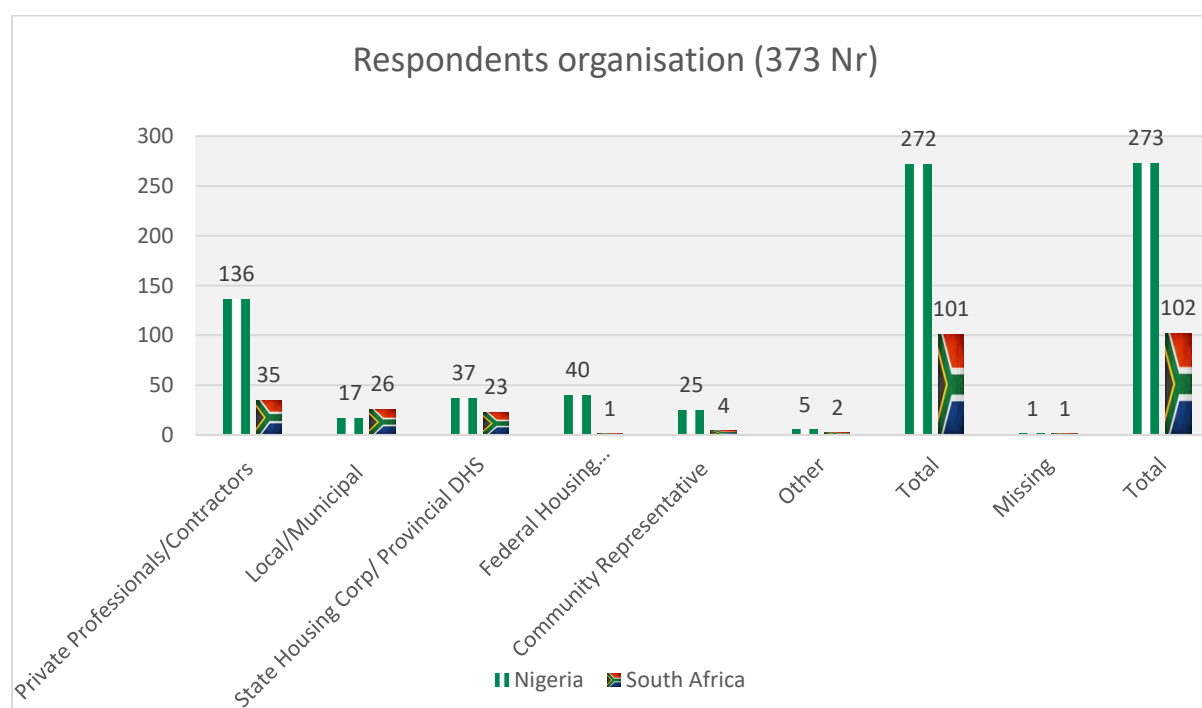
Figure 5. 7: Respondents organisation

Source: Researcher's Analysis of Data (2019)

5.2.7 Respondents level of involvement in human settlements management

The question sought to validate whether the respondents were significantly involved in human settlement management activities and the results of the three hundred and seventy-five (375) (Nr) respondents shown in Table 5.8 revealed that 32% (120 Nr) expressed that they were extremely involved, whereas 43.5% (163 Nr) responded that they were very involved and 15.5% (58 Nr) revealed that they were moderately involved. 6.4% (16 Nr) posited that they were slightly involved and only 1.9% (7 Nr) disclosed that they were not involved at all.

From these findings, at least 75.5% of the respondent's showed significant involvement in the activities of human settlement management as against 24.5% who were moderately or slightly involved.

These findings confirmed in the research context that a very significant percentage of the respondents are expressly involved in the management of human settlements.

Hence, it can be inferred that the information they supplied for this study is credible, reliable, consistent, representative and coherent, and that the findings emanating from it are considered acceptable.

Table 5. 8: Level of involvement in human settlement management

Level of involvement in the management of human settlements	Nigeria		South Africa		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Extremely involved	94	34.4	26	25.5	120	32.0
Very involved	118	43.2	45	44.1	163	43.5
Moderately Involved	43	15.8	15	14.7	58	15.5
Slightly Involved	16	5.9	8	7.8	24	6.4
Not Involved	1	0.4	6	5.9	7	1.7
Missing	1	0.4	2	2.0	3	0.8
Total	**273**	**100.0**	**102**	**100.0**	**375**	**100.0**

Source: Researcher's Field Survey (2019)
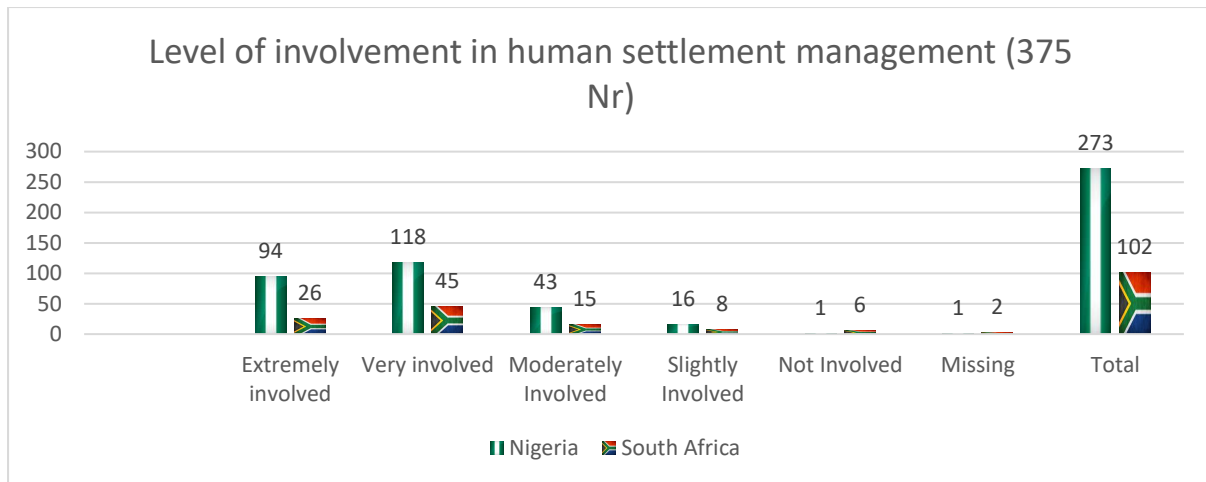
Figure 5. 8: Level of involvement in human settlement management

5.3 The physical condition of human settlements

Analysed results are presented and discussed to understand the existing human settlements in Nigeria and in South Africa. The questionnaires investigated the location, age, density, types of buildings and the physical states of the human settlements. These results addressed the first research objective which is to "undertake a study of the existing human settlements or neighbourhoods in Nigeria and in South Africa", and it only analysed and showed the results of the data generated from the study. The interpreted data were collected using a questionnaire, and the results will aid in the consequent development of a model for the management of human settlements for sustainability.

The main sub-objectives of this section are to:

- identify and categorise the locations of the human settlements;
- ascertain the ages of the human settlements;
- assess the types of building and density of the human settlements; and
- evaluate the current physical state and condition of the human settlements.

The analysis of data generated from the questionnaire survey in this section adopted the QuestionPro® to collect data, while the Statistical Package for the Social Sciences (SPSS®) was used as a descriptive statistical tool for an in-depth understanding of the quantitative data generated. Section B (that is questions 8, 9, 10, 11 and 12) of the field instrument provides the questions asked to investigate and answer the main sub-objectives in this section.

5.3.1 Location of human settlements of respondents

To confirm if the research spreads across the case studies, the respondents were requested to affirm the location of the human settlements they manage. As shown in Figure 5.9 and Table 5.9, the respondents were spread across the three major regions of the North (2.2%), East (4%) and West (78%), as well as the Federal Capital Territory (8.8 %) in Nigeria. Lagos, the commercial nerve centre of Nigeria, that has the highest frequency of 64.1% (175 Nr), while the Federal Capital has 8.8% (24 Nr).
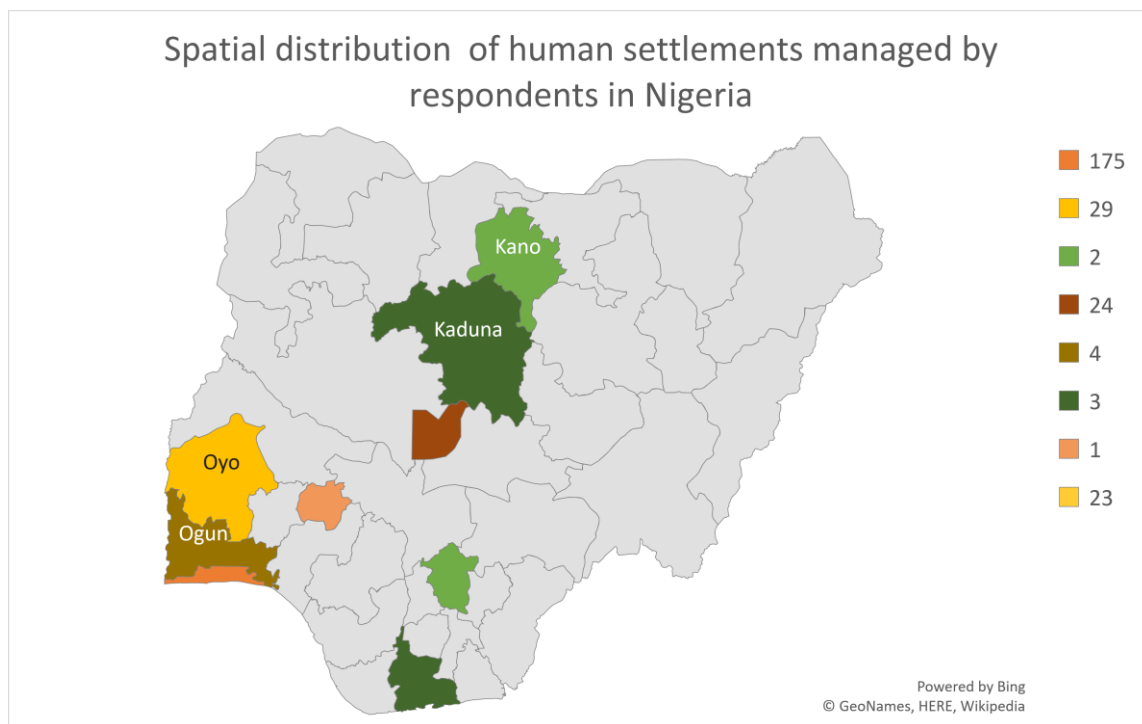
Figure 5. 9: Spatial distribution of human settlements managed by respondents in Nigeria

Source: Researcher's Analysis of Data (2019)

Table 5. 9: Location of human settlements managed by respondents in Nigeria

Region	State	Frequency	Percent
West	Lagos	175	64.1
	Oyo	29	10.6
	Ogun	4	1.5
	Ekiti	1	0.4
	Ogun	4	1.5
East	Imo	2	0.7
	Enugu	2	0.7
	Rivers	3	1.1
	Delta	3	1.1
	Edo	1	0.4
Federal Capital	Federal Capital Territory	24	8.8
North	Kano	2	0.7
	Kaduna	3	1.1
	Niger	1	0.4
	Missing	19	7.0
Total		**273**	**100.0**

Source: Researcher's Field Survey (2019)

Figure 5.10 and Table 5.10 also illustrate the spatial spread of human settlements managed by the respondents, and it spreads across six (6) out of the nine (9) provinces in the Republic of South Africa. Limpopo and the Free state Province have 1% (1 Nr) each, while the Western Cape Province has 12% (12 Nr). 13% (13 Nr) each, which revealed that the rest of the human settlements are in the Gauteng and KwaZulu-Natal Province, while the Eastern Cape Province has 51% (53 Nr).

This data reveals that although there are clusters of responses, there is a spread of responses forming a broad area in each of the case study nations.

Table 5. 10: Location of human settlements managed by respondents in South Africa

Province	Frequency	Percent
Limpopo	1	1
Eastern Cape	52	51
Gauteng	13	13
KwaZulu-Natal	13	13
Western Cape	12	12
Free State	1	1
Missing	10	10
Total	**102**	**100**

Source: Researcher's Field Survey (2019)
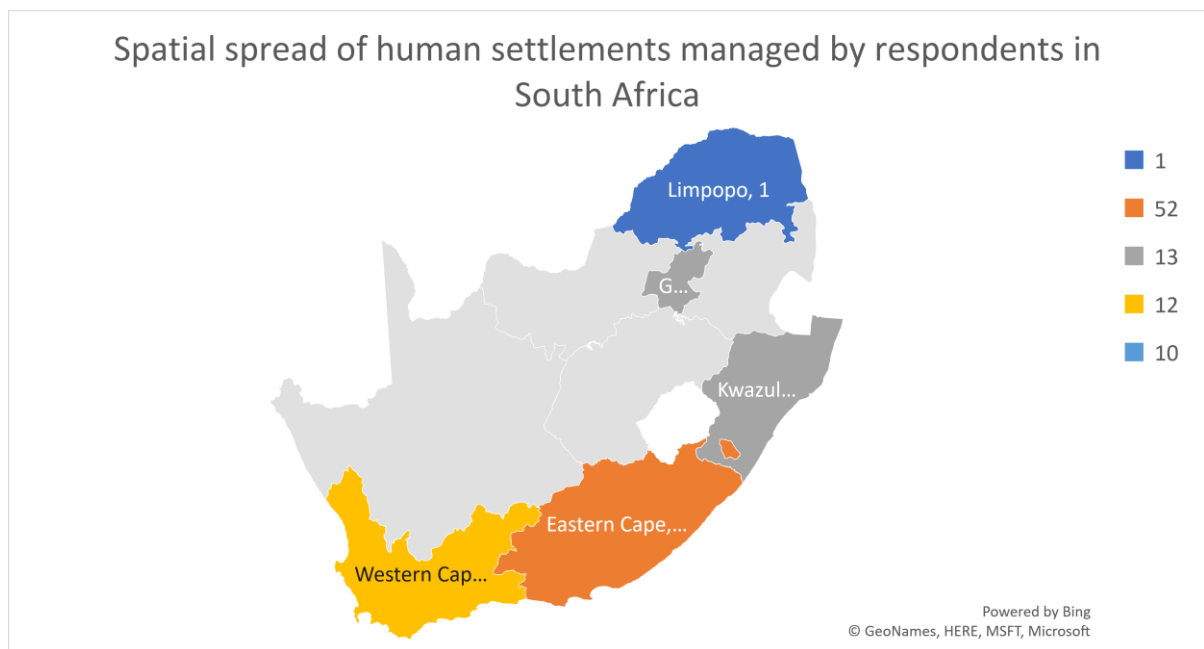
Figure 5. 10: Spatial spread of human settlements managed by respondents in South Africa

Source: Researcher's Analysis of Data (2019)

5.3.2 Age of human settlements of the respondents

This theme and the related question seek to evaluate the ages of the human settlements managed by the study participants. Age could define the level of wear and tear as well as the condition of the components of human settlements and as such, there is a need to evaluate the age of the settlements. The data illustrated in Table 5.11 and Figure 5.11 reveals that most of the human settlements are between the ages of one to ten (1 to 10) years at 34.7% (130 Nr) and followed by eleven to twenty (11 to 20) years at 30.4% (114 Nr). Also, 21.3% (80 Nr) are between the ages of twenty-one to thirty (21 to 30) years while 9.95% (37 Nr) and 1.3% (5 Nr) are above thirty (30) years old or less than one year old, respectively. However, South Africa is seen to have the higher figure (over 70%) in the range of between one to twenty (1 to 20) years old and this shows that most of the human settlements were constructed between 1995 to date in the period when the country returned to democracy and the focus of the government was directed towards mass housing provision for the disadvantaged black populace. This chapter will later confirm this inference, showing the type of ownership within human settlements.

Table 5. 11: Age of human settlements

Age of human settlements	Nigeria		South Africa		Total	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Less than 1 year	2	0.7	3	2.9	5	1.3
1-10 years	69	25.3	61	59.8	130	34.7
11-20 years	95	34.8	19	18.6	114	30.4
21-30 years	70	25.6	10	9.8	80	21.3
Above 30 years	32	11.7	5	4.9	37	9.9
Total	268	98.2	98	96.1	366	97.6
Missing	5	1.8	4	3.9	9	2.4
Total	**273**	**100.0**	**102**	**100.0**	**375**	**100.0**

Source: Researcher's Field Survey (2019)
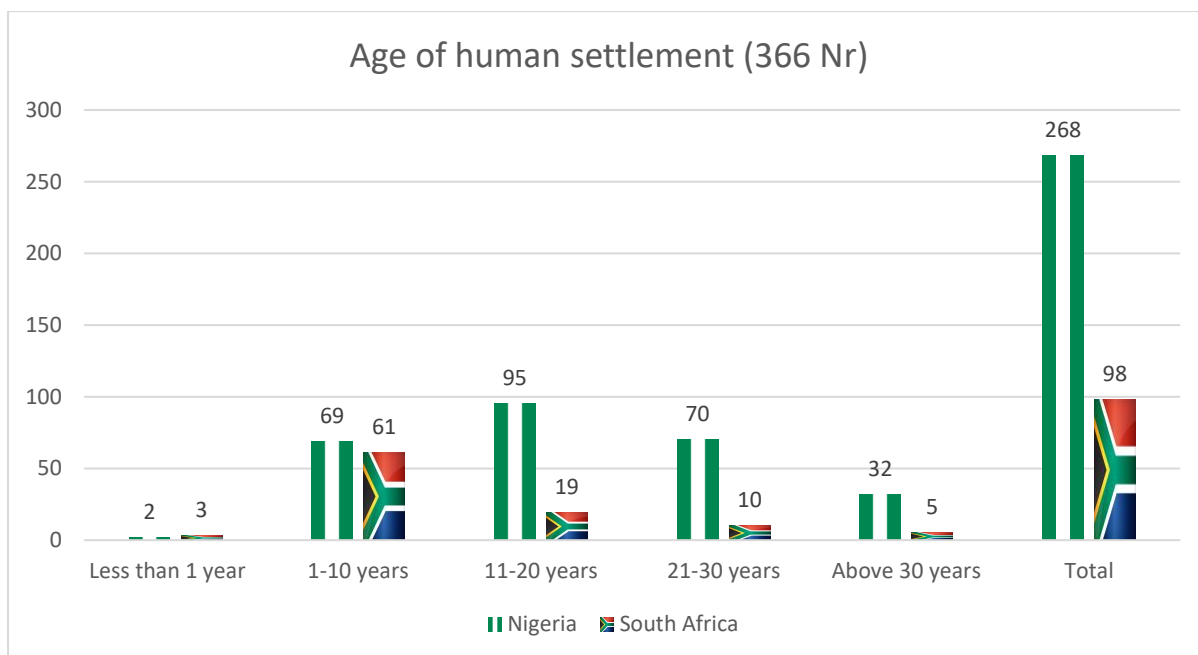
Figure 5. 11: Age of human settlements

Source: Researcher's Analysis of Data (2019)

5.3.3 Types of building and density in the human settlements of respondents

Table 5.12 shows that 33.6% (201 Nr) of the respondents indicated that they had blocks of flats in their human settlements, while 33.1% (198 Nr) specified detached houses. 25.1% (150 Nr) said that they have terraced bungalows, while 6.9% (41 Nr) indicated condominiums and 1.3% (8 Nr) specified other. Table 5.12 indicates that In Nigeria, there is no substantial difference in the number of responses for terraced bungalows and detached houses with both at 29%. Blocks of flats have a more significant number of 33% while the condominium represents 7%. However, in South Africa, detached houses represent 46.1%, and blocks of flats represent 34.8%. The result is an accurate representation as the government provides more of these units in the Break New Grounds (BNG), the Finance Linked Individual Subsidy Programme (FLISP) and other housing programmes.

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Table 5. 12: Types of buildings in the human settlements

Types of buildings in human settlements	Nigeria		South Africa		Combined	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Terraced Bungalows	136	29.8	14	9.9	150	25.1
Detached Houses	133	29.1	65	46.1	198	33.1
Condominium	32	7.0	9	6.4	41	6.9
Block of Flats	152	33.3	49	34.8	201	33.6
Others	4	0.9	4	2.8	8	1.3
Total					598	100.0

Source: Researcher's Field Survey (2019)
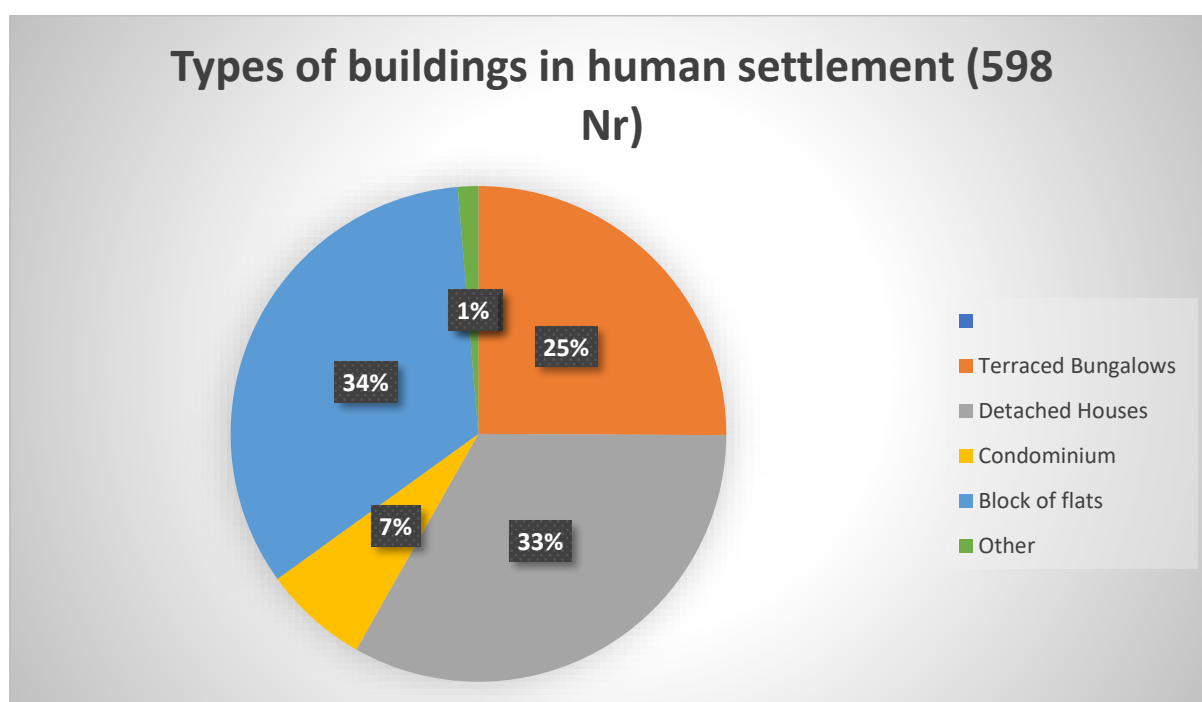
Figure 5. 12: Types of buildings in human settlements

Source: Researcher's Analysis of Data (2019)

The data in Table 5.13 indicates that 45.3% (170 Nr) of the respondents indicated that their settlements are medium density, while 26.7% (100 Nr) specified their settlements as low density whereas 16.3% (61 Nr) responded mixed density. Nevertheless, 9.1% (34 Nr) indicated that their settlements are high density areas.

Table 5. 13: Density of human settlements

The density of human settlements	Nigeria		South Africa		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Low density	88	32.2	12	11.8	100	26.7
Medium density	119	43.6	51	50.0	170	45.3
High density	22	8.1	12	11.8	34	9.1
Mixed density	38	13.9	23	22.5	61	16.3
Total	267	97.8	98	96.1	365	97.3
Missing	6	2.2	4	3.9	10	2.7
Total	273	100.0	102	100	375	100.0

Source: Researcher's Field Survey (2019)
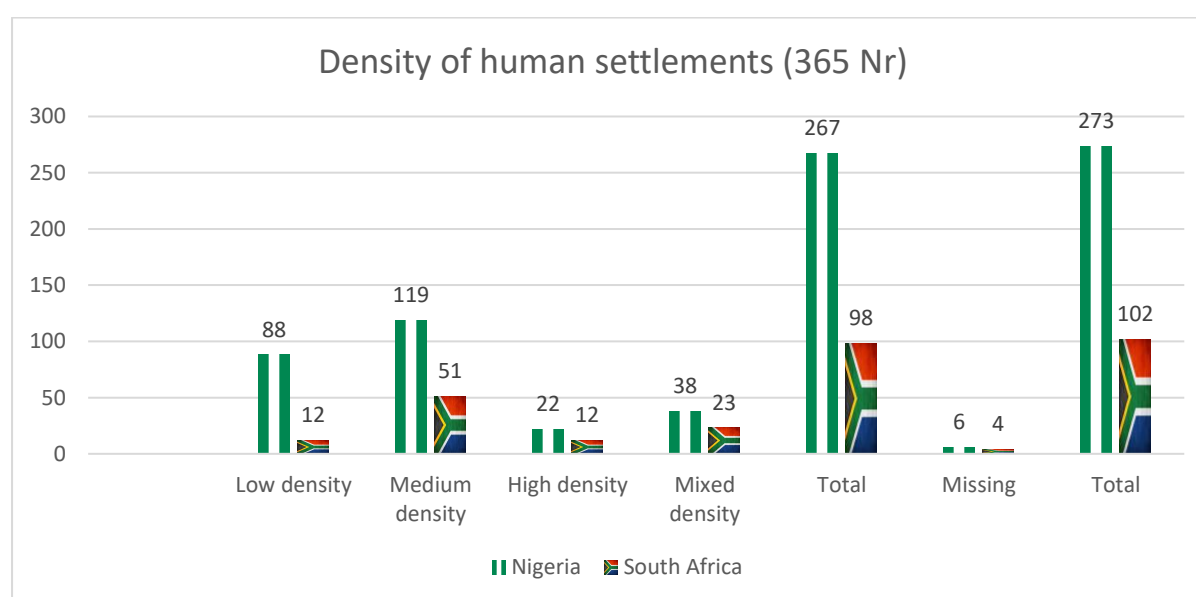
Figure 5. 13: Density of human settlements

Source: Researcher's Analysis of Data (2019)

Table 5.14 illustrates a cross-tabulation of density against the types of buildings in the human settlements, as indicated by the respondents. In Nigeria, terraced bungalows are indicated to be 41.2% (56 Nr) in low-density human settlements, 36% (49 Nr) in medium-density human settlements, 0.7% (1 Nr) in high density human settlements and 22.1% (31 Nr) in mixed density human settlements. Detached houses are also indicated to be at 31.9% (52Nr) in low-density human settlements, 36.8% (49 Nr) in medium-density human settlements, 2.3% (3 Nr) in high-

density human settlements and 21.8% (29 Nr) in mixed density human settlements. Furthermore, condominiums have 34.4% (11 Nr) in medium density settlements and 21.9% each, in low density, high density and mixed density human settlements. Others which included Brazilian type buildings, have 25% (1 Nr) in low-density human settlements and 75% (3 Nr) in high-density human settlements.

Table 5.14 further shows the South African respondents indicating that terraced bungalows are at 35.7% (5 Nr) in low-density human settlements, 14.3% (2 Nr) in medium-density human settlements, none in high-density human settlements and 50% (7 Nr) in mixed density human settlements. Detached houses are also shown to be at 11.3% (7 Nr) in low-density human settlements, 51.6% (32 Nr) in medium-density human settlements, 9.7% (6 Nr) in high-density human settlements and 27.4% (17 Nr) in mixed density human settlements. Additionally, Table 5.14 also shows that condominiums are not found in low-density human settlements and 1% (1 Nr) in medium density and 44.4% (4 Nr) each in high density and mixed density human settlements. Others which included Brazilian type buildings have 25% (1 Nr) each in low and medium density human settlements and 50% (2 Nr) in high-density human settlements.

Table 5. 14: Density versus types of buildings

	Terraced Bungalows		Detached Houses		Condominium		Block of Flats		Other	
Nigeria	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Low density	56	41.2	52	39.1	7	21.9	16	10.6	1	25.0
Medium density	49	36.0	49	36.8	11	34.4	84	55.6	0	0.0
High density	1	0.7	3	2.3	7	21.9	19	12.6	3	75.0
Mixed density	30	22.1	29	21.8	7	21.9	32	21.2	0	0.0
South Africa	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Low density	5	35.7	7	11.3	0	0.0	3	6.4	1	25.0
Medium density	2	14.3	32	51.6	1	11.1	21	44.7	1	25.0
High density	0	0.0	6	9.7	4	44.4	6	12.8	0	0.0
Mixed density	7	50.0	17	27.4	4	44.4	17	36.2	2	50.0

Source: Researcher's Field Survey (2019)

5.3.4 Current physical state and condition of the human settlements of respondents

The State of Queensland Department of Housing and Public Works (2017) policy document, on maintenance management frameworks, which is applicable to the general human settlement physical condition provides the following definitions: "Very Poor" housing (human settlement) falls within a community or a component that has failed; not viable nor functional; uninhabitable, where there is a predominance of environmental / contamination / pollution. However, it is considered "poor" where there is a critical deterioration of features; where there are structural problems and substandard façades with major defects; and frequent component failure. An "acceptable condition" exists when there is evidence of substantial defects; dilapidated façades demanding maintenance; where functional facilities require attention due to delayed maintenance activity, and where average physical appearance prevails in the units. "Good" refers to units with inconsequential defects; insignificant wear and tear; worsening finishes; where vital maintenance activity is not required. A "very good" condition exists in human settlements when there are no defects, where units appear looking 'as new', in usage and appearance.

Table 5.15 shows each of the components of human settlement conditions of the respondents' units in Nigeria, and they rated the global environment as being rated at 3.66. The table reveals that respondents rated high the following as high, with security having a mean figure of 4.02 followed sequentially by windows, 3.88; walls, 3.85; floors, 3.83; floor condition, 3.73; paintings, 3.24 and waste disposal at 3.18. It is also apparent from the table that road networks, electricity supply and water supply were rated below average, with mean values of 2.87, 2.34 and 2.36, respectively.

Figure 5.14 displays a mean bar graph at a 95% confidence interval, which reveals that there is a significant difference or otherwise, in the perception of the respondents on the different variables used to identify the conditions in human settlements. There is a significant difference between security and the other variables, and there is no significant difference between responses on windows, walls, floors and on the general environment. On the other hand, Table 5.16 revealed that all the components have a rated mean value that is above 3.00. Electricity and water supply are ranked highest, with a mean value of 3.86 each, while waste disposal is ranked the lowest with a mean value of 3.42. Figure 5.15 indicates that there is not much difference in the responses of the participants to the different variables used in qualifying the condition of South African human settlements.

Table 5. 15: Current physical state and condition of the human settlements managed by Nigerian respondents

Component	N	Mean	Median	Std. Deviation	Min	Max	95% CI
Security[2]	265	4.02	4.00	1.022	1	5	0.123094374
Windows[1]	271	3.88	4.00	0.658	2	5	0.078369708
Walls[1]	271	3.85	4.00	0.627	2	5	0.07463438
Floor[1]	267	3.82	4.00	0.599	2	5	0.071823622
Roof condition[1]	271	3.73	4.00	0.725	2	5	0.08628146
General environment[1]	265	3.66	4.00	0.655	1	5	0.078809865
Paintings[1]	263	3.24	3.00	0.778	1	5	0.093981113
Waste disposal[2]	265	3.18	3.00	0.824	1	5	0.099226614
Road network[2]	264	2.87	3.00	0.849	1	5	0.102428236
Water supply[2]	263	2.36	2.00	0.954	1	5	0.115355838
Electricity supply[2]	265	2.34	2.00	0.898	1	5	0.108176396

Source: Researcher's Field Survey (2019) (Key: [1] are physical components. [2] are services)
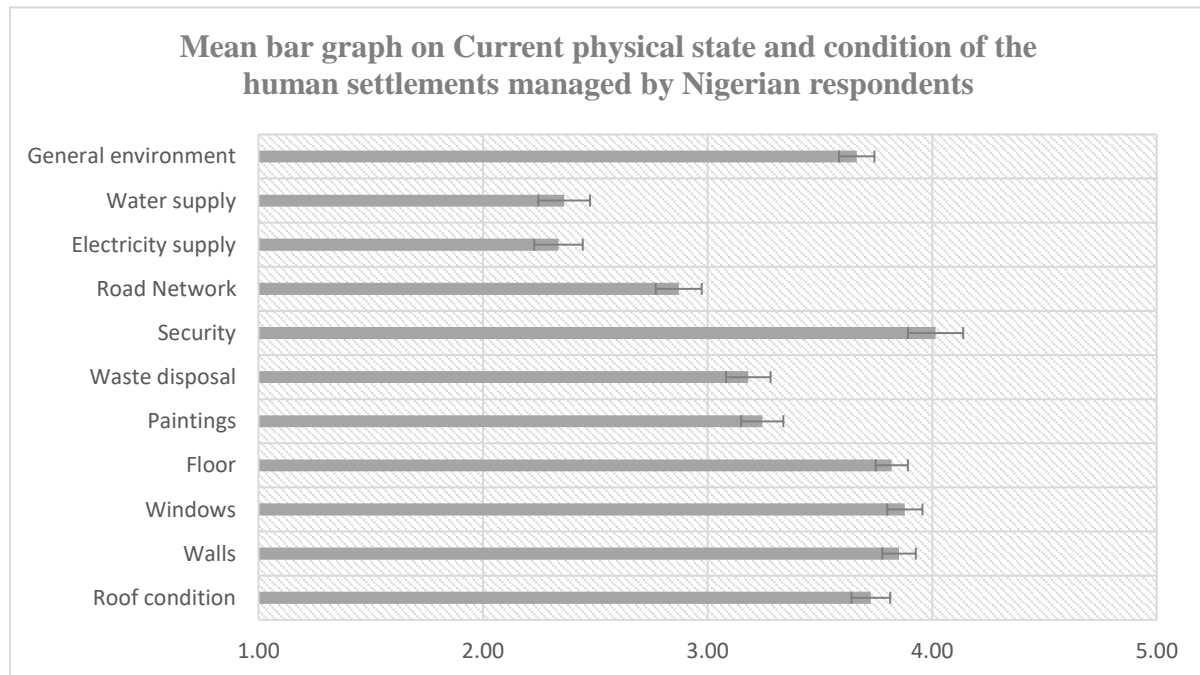
Figure 5. 14: Mean bar graph on Current physical state and condition of the human settlements managed by Nigerian respondents

Table 5. 16: Current physical state and condition of the human settlements managed by South African respondents

Components	N	Mean	Median	Std. Deviation	Min	Max	95% CI
Electricity supply	100	3.86	4.00	0.711	2	5	0.139347
Water supply	99	3.86	4.00	0.714	2	5	0.140734
Roof condition	102	3.84	4.00	0.741	1	5	0.143848
Windows	102	3.83	4.00	0.797	1	5	0.154686
Floor	100	3.82	4.00	0.809	1	5	0.158523
Walls	102	3.77	4.00	0.807	1	5	0.156658
General environment	100	3.77	4.00	0.815	2	5	0.159681
Security	100	3.65	4.00	0.947	1	5	0.185576
Paintings	101	3.64	4.00	0.832	1	5	0.162199
Road Network	100	3.50	4.00	0.882	1	5	0.172856
Waste disposal	100	3.42	3.00	0.987	1	5	0.193369

Source: Researcher's Field Survey (2019)
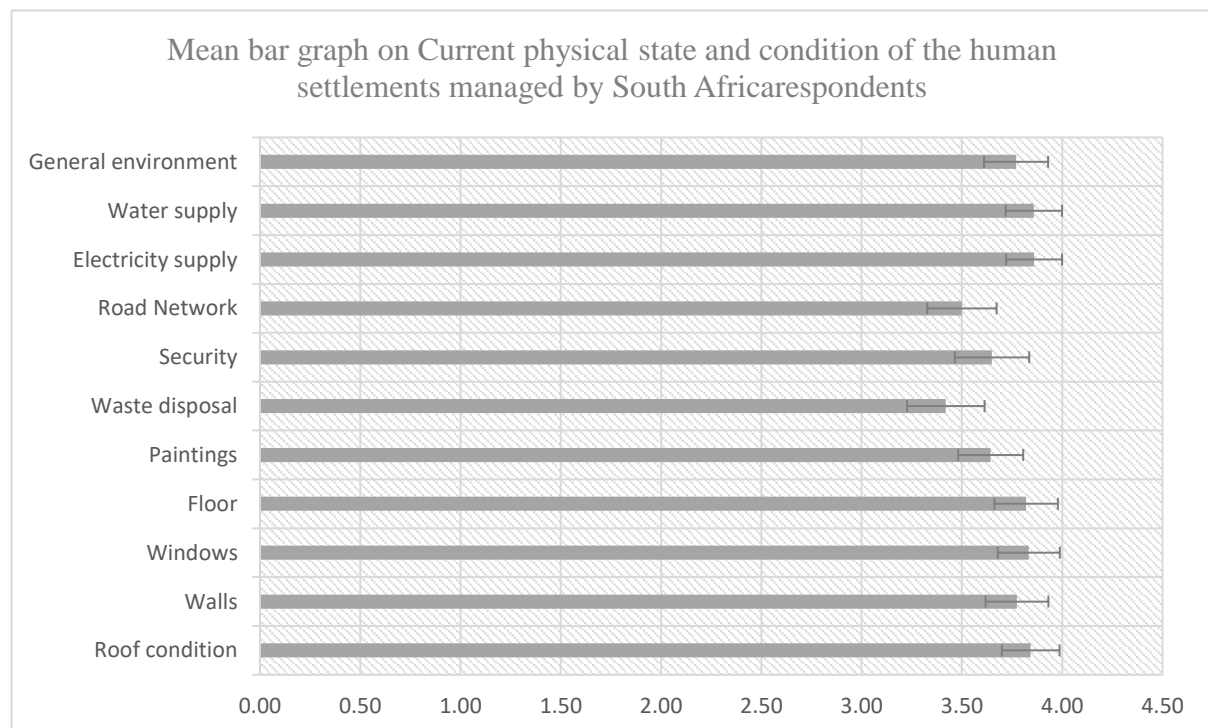
Figure 5. 15: Mean bar graph on Current physical state and condition of the human settlements managed by South African respondents.

Table 5.17 illustrates the current physical state as well as the state of services, as indicated by the respondents. The physical state of integrated human settlements has a mean score of 3.706, which suggests that it is beyond average while the state of the service, which is rated 3.081 is also on the verge of average.

Table 5. 17: State of integrated human settlements in Nigeria

The elements of human settlement	N	Missing	Mean	Median	Std. Deviation	Range	Min	Max
Physical	271	2	3.706	3.800	0.578	3.200	1.800	5.000
Services	268	5	3.081	3.000	0.607	3.333	1.667	5.000

Source: Researcher's Field Survey (2019)

The data was further subjected to ANOVA to check whether there was a significant difference between the physical state and age as well as between service and age, and the result was presented in Table 5.18.

There was a significant difference between the physical state of the human settlements and the age of the human settlements, as shown in Table 5.17 at the $p<0.05$ level for the three conditions (F (11.420,77.693) = 12.886, p = 0.001). Post hoc comparisons using the Tukey HSD test (Table 5.19) indicated that human settlements that are less than ten (10) years old are in better physical condition than those above ten (10) years old. This result suggests that the older a human settlement grows, the poorer the physical condition becomes. However, Table 5.18 further revealed that there is no significant difference between the state of services and the age of the services in the human settlements at the $p<0.05$ level for the three conditions (F (2.685,89.021) = 2.614, p = 0.052).

Table 5. 18: Correlation between the physical state/ services and age (Nigeria)

ANOVA (Physical State Vs Age)					
	Sum of Squares	**df**	**Mean Square**	**F**	**p-value**
Between Groups	11.420	3	3.807	12.886	0.000
Within Groups	77.693	263	0.295		
Total	89.113	266			
ANOVA (Services vs Age)					
Between Groups	2.685	3	0.895	2.614	0.052
Within Groups	89.021	260	0.342		
Total	91.706	263			

Source: Researcher's Analysis of Data (2019)

Table 5. 19: Tukey HSD Post Hoc Tests (Physical State and age)

Group 1	**Group 2**	**p-value**
10 years or less	11 to 20 years	0.000
	21 to30 years	0.000
	Above 30 years	0.000
11 to 20 years	10 years or less	0.000
	21 to 30 years	0.941
	Above 30 years	0.413
21 to 30 years	10 years or less	0.000
	11 to 20 years	0.941
	Above 30 years	0.712
Above 30 years	10 years or less	0.000
	11 to 20 years	0.413
	21 to 30 years	0.712

Source: Researcher's Analysis of Data (2019)

Table 5.20 also suggests that the physical state and services conditions of South African human settlements are above average, with a mean of 3.781 and 3.684, respectively.

Table 5. 20 State of integrated human settlements in South Africa

Element of human settlement	N	Missing	Mean	Median	Std. Deviation	Range	Min	Max
Physical	102	0	3.781	4.000	0.723	3.400	1.600	5.000
Services	101	1	3.684	3.833	0.730	3.333	1.667	5.000

Source: Researcher's Analysis of Data (2019)

Further evidence as revealed from Table 5.21 shows that there was no significant relationship difference between the physical state and the age of the respondents' human settlement as well as between the services and the age of human settlements, as indicated by the South African respondents. Physical state and age t (96) = -0.576, p = 0.566 while service condition t (95) = -1.727, p = 0.087.

Table 5. 21: Correlation between the physical state / services and age (South Africa)

		N	Mean	Std. Deviation	Std. Error Mean	F	p-value (variance)	t	df	p-value	Cohen's d
Physical State	≤10	64	3.7406	0.75313	0.09414	0.032	0.859	-0.576	96	0.566	N/A
	>10	34	3.8309	0.71074	0.12189						
Services	≤10	64	3.5755	0.78955	0.09869	3.306	0.072	-1.727	95	0.087	N/A
	>10	33	3.8465	0.60306	0.10498						

Source: Researcher's Analysis of Data (2019)

A further test to confirm if there was a relationship between physical condition, services and density of human settlement was carried out and presented below.

Table 5. 22: Correlation between the physical state / services and density (Nigeria)

ANOVA (Physical State Vs Density)	Sum of Squares	df	Mean Square	F	p-value
Between Groups	15.658	3	5.219	18.633	0.000
Within Groups	73.672	263	0.280		
Total	**89.330**	**266**			
ANOVA (Services Vs Density)					
Between Groups	11.026	3	3.675	12.363	0.000
Within Groups	77.296	260	0.297		
Total	**88.322**	**263**			

Source: Researcher's Analysis of Data (2019)

There was a significant relationship between the physical state of the human settlements and the density of the human settlement population of the Nigerian respondents, as shown in Table 5.21 at the $p<0.05$ level for the three conditions ($F (15.568, 73.672) = 18.633$, $p = 0.001$). Post hoc comparisons using the Tukey HSD test (Table 5.23) indicated that high-density human settlements' physical condition is poorer than the physical conditions of those with low, medium and mixed densities. This result suggests that the higher the density of human settlements, the poorer the physical condition is. There is also a significant relationship between services and the density of human settlements of the Nigerian respondents, as also shown in Table 5.23 at the $p<0.05$ level for the three conditions ($F (11.026, 77.296) = 12.363$, $p = 0.001$). Post hoc comparisons using the Tukey HSD test indicated in Table 5.22 also revealed that there is a relationship between density and services as high-density human settlements' services are more inadequate than the services of other densities. This result suggests that the higher the density of a human settlement, the poorer the services are.

Table 5. 23: Tukey HSD Post Hoc Tests physical state / services and density (Nigeria)

	Group 1	Group 2	p-value
Physical State	Low density	Medium density	0.168
		High density	0.000
		Mixed density	0.964
	Medium density	Low density	0.168
		High density	0.000
		Mixed density	0.715
	High density	Low density	0.000
		Medium density	0.000
		Mixed density	0.000
	Mixed density	Low density	0.964
		Medium density	0.715
		High density	0.000
Services	Low density	Medium density	0.002
		High density	0.000
		Mixed density	0.177
	Medium density	Low density	0.002
		High density	0.001
		Mixed density	0.925
	High density	Low density	0.000
		Medium density	0.001
		Mixed density	0.002
	Mixed density	Low density	0.177
		Medium density	0.925
		High density	0.002

Source: Researcher's Analysis of Data (2019)

From the result of the analysis for the South African respondents, as shown in Table 5.24, there is a significant relationship between the physical state of human settlements and its density (F $(5.506, 46.602) = 3.702$, p $= 0.01$) while there is no significant difference between the state of services and the density of the human settlements (F $(3.790, 47.628) = 2.467$, p $= 0.067$). A further examination of the difference in the physical state and density, as illustrated in Table

5.25, shows that there is a significant difference between the services in the physical state of low and medium density human settlements, as indicated by the respondents.

Table 5. 24: Correlation between the physical state / services and density (South Africa)

ANOVA (Physical State Vs Density)	Sum of Squares	df	Mean Square	F	p-value
Between Groups	5.506	3	1.835	3.702	0.014
Within Groups	46.602	94	0.496		
Total	**52.108**	**97**			
ANOVA (Services Vs Density)					
Between Groups	3.790	3	1.263	2.467	0.067
Within Groups	47.628	93	0.512		
Total	51.418	96			

Source: Researcher's Analysis of Data (2019)

Table 5. 25: Tukey HSD Post Hoc Tests physical state and density (South Africa)

	Group 1	Group 2	p-value
Physical State	Low-density	Medium density	0.009
		High density	0.481
		Mixed density	0.174
	Medium density	Low density	0.009
		High density	0.503
		Mixed density	0.630
	High density	Low density	0.481
		Medium density	0.503
		Mixed density	0.976
	Mixed density	Low density	0.174
		Medium density	0.630
		High density	0.976

Source: Researcher's Analysis of Data (2019)

5.4 Human Settlements Maintenance Management

This section presents the data analysis and the discussions of the results of the case study, to establish the human settlements maintenance and management types and practices in Nigeria and in South Africa. This section will help to identify the human settlement management and maintenance principles and the approaches used in the management employed in human settlements in Nigeria and in South Africa. The second objective of "ascertaining human settlements maintenance and management types and practices in Nigeria and South Africa" will be addressed by this and will help toward the development of a management model for human settlements. The results of the data retrieved from the fieldwork, particularly for those of Estate Management methods and maintenance management practices currently adopted in the human settlements, will be analysed to provide a basis for later discussion of the results, utilising cross-referencing to the evidence, based on the reviewed body of knowledge on this subject.

The main sub-objectives of this section are:

- To ascertain the Estate Management approach used in human settlements;
- To identify the ownership status of the human settlements or the housing estates;
- To classify the maintenance types adopted in the management of the human settlements and reasons for its use;
- To appraise the typical maintenance condition of the human settlements;
- To assess the level of completion of the human settlements; and
- To identify, ascertain and evaluate the factors that affect human settlement management and the impact rates of such factors.

Section C (that is questions 13, 14, 15, 16, 17 and 18) of the field instrument provides the questions asked to investigate and answer the sub-objectives in this section.

5.4.1 The Estate Management approach used for human settlements

This question in the research context seeks to ascertain the Estate Management methods available in practice applied in managing human settlements. The results in Table 5.26 and Figure 5.16 indicated that the outsourcing method at 42.1% (158 Nr) was the most used management method, while partnership (a hybrid of in-house and outsourced) followed at 30.1% (113 Nr) and 17.1% (64 Nr) disclosed that the Estate Management method used was in-house. Whereas 4.8% (18 Nr) declared that they were unsure and 2.7% (10 Nr) expressed that none of the methods was in use, while 2.4% (9 Nr) revealed that they were unaware of any technique in use. What is interesting in Table 5.26 is that the majority of the respondents in the two countries said that the management of the human settlement was outsourced and Banfield (2005) agreed that each method has its merits and demerits and that the management method chosen depends on the available resources and the managers' stance.

Table 5. 26: Estate Management approach used in human settlements management

Estate Management approach used in human settlements	Nigeria		South Africa		Combined	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Unaware	1	0.4	8	7.8	9	2.4
None	9	3.3	1	1.0	10	2.7
In-house	43	15.8	21	20.6	64	17.1
Outsourced	116	42.5	42	41.2	158	42.1
Partnership / Hybrid of in-house and outsourced	96	35.2	17	16.7	113	30.1
Unsure	5	1.8	13	12.7	18	4.8
Total	**270**	**98.9**	**102**	**100.0**	**372**	**99.2**
Missing	3	1.1	0	0	3	0.8
Total	**273**	**100.0**	**102**	**0**	**375**	**100.0**

Source: Researcher's Field Survey (2019)
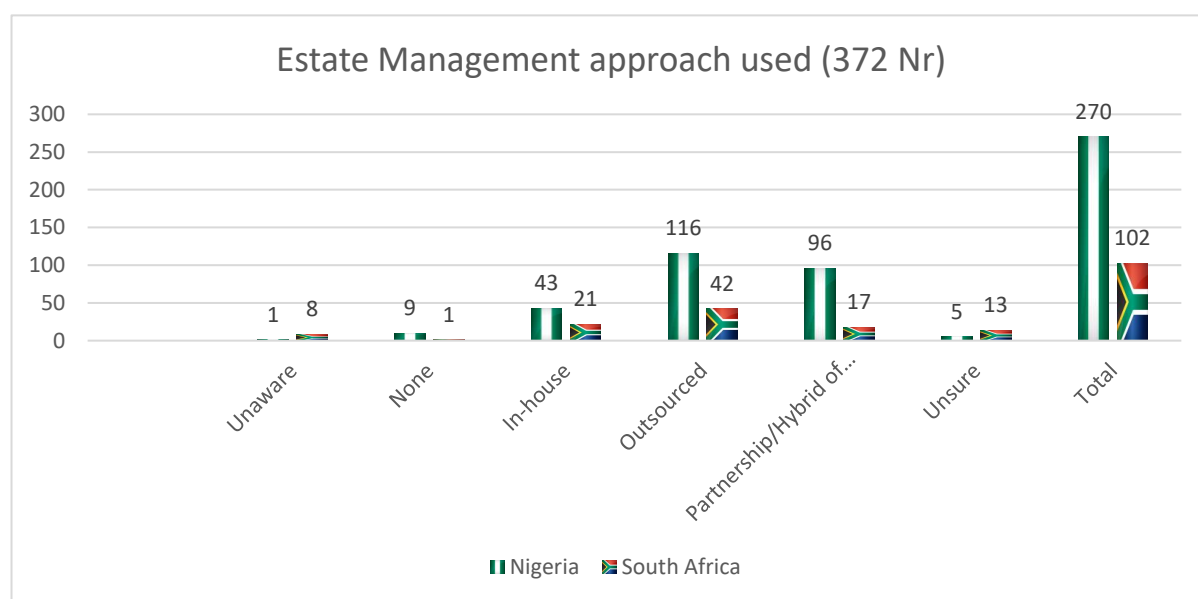
Figure 5. 16: Estate Management approach

Source: Researcher's Analysis of Data (2019)

5.4.2 Ownership of human settlements

The question in this theme attempts to determine the owner(s) of the human settlements under this research context. Some of the respondents are managing more than one human settlements which are owned by different form of owners hence the number of responses is more than 375. The quantitative results, as revealed in Figure 5.17, displays the responses as to the owners of

the human settlements in the case studies. 35% (137 Nr), which ranks the highest, is specified as being privately-owned, followed by 25% (98 Nr) which are provincial or state owned. 16% (65 Nr) of the responses indicated that the municipalities owned the human settlements while 11% (43 Nr) each stated that the Federal or National government and the Private-Public Partnership owned their human settlement. However, 1.8% (7 Nr) of the participants signified that they were unsure about the ownership of the human settlement they lived in. These results revealed that human settlements are observed to be 60.0% owned by the various arms of Government. A further look at the case studies individually as illustrated in Table 5.27 showed that, despite having different housing policies, the ownership types do not show any significant difference as the government seems to be the primary provider of human settlements overall.

Table 5. 27: Ownership of human settlement

Ownership of Human Settlements	Nigeria		South Africa		Combined	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Private	97	35.5	40	39.2	137	34.9
Local / Municipal Government	26	9.5	39	38.2	65	16.6
Provincial / State Government	79	28.9	19	18.6	98	25.0
National / Federal Government	41	15.0	2	2.0	43	11.0
Public Private Partnership	31	11.4	11	10.8	42	10.7
Unsure	2	0.7	5	4.9	7	1.8
Total	276	100	116	100	392	100.0

Source: Researcher's Field Survey (2019)
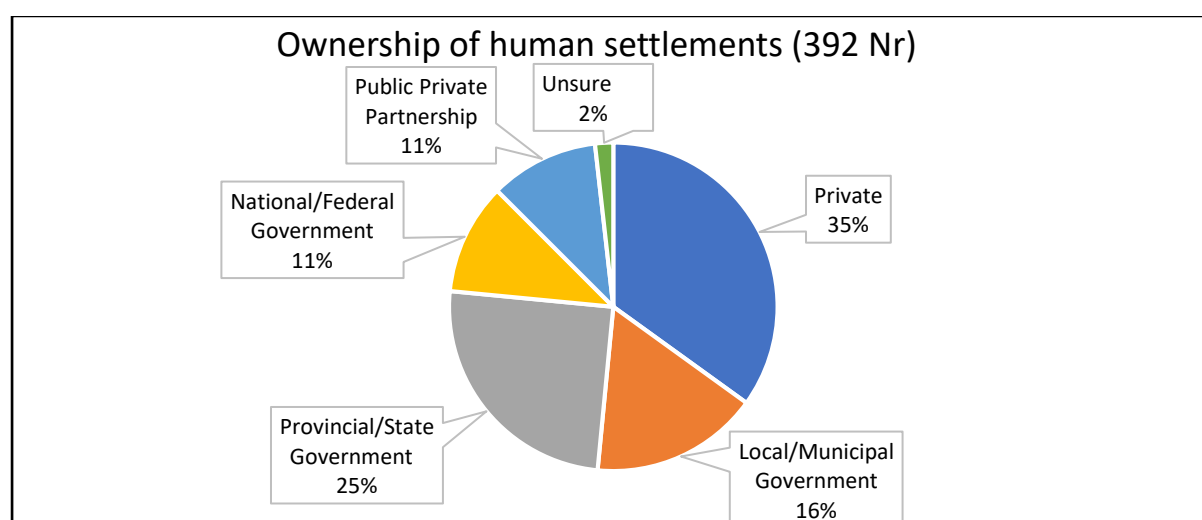
Figure 5. 17: Ownership of human settlement

Source: Researcher's Analysis of Data (2019)

5.4.3 Maintenance types adopted and the reason

The question was requested to ascertain and to evaluate the degree of operation of the maintenance management alternatives available in practice for the management of human settlements. The question allowed for multiple selection hence the result of the response in this section. The resulting data indicated in Table 5.28 and Figure 5.18 indicated that the approach most be adopted in the maintenance management of human settlements was reactive maintenance 61.9% (302 Nr), while planned corrective maintenance comprised 15.2% (74 Nr) and planned preventive maintenance was at 13.1% (64 Nr).

Unplanned maintenance was at 7.4% (36 Nr), and only 1.0% (5 Nr) each, was shown as being unaware and unsure regarding the type of maintenance management approach from the participants.

The results substantiate that about 28.0% employed the use of a planned preventative and planned corrective maintenance management approach, compared with some 69% of the human settlements using an unplanned corrective maintenance management approach and this could lead to ineffective human settlement sustainability. This result suggests a likely reason for the current condition of human settlements.

Documentary evidence such as the National maintenance management standard for immovable assets (Department of Public Works/CIDB 2017) and the Nigerian National Housing Policy (Federal Republic of Nigeria 2011) both aim at ensuring sustainable maintenance of all physical assets and infrastructure, without a specific maintenance management method that would enhance continuity and reduce the bad and poor conditions and shortage of human settlement stock.

However, researchers such as Barberá Martínez *et al*., (2018:327) and Lee & Scott (2009:270) opined that to keep the assets in good condition and for the return or the benefits of its provision to be achieved, a Planned Preventive Maintenance approach should be adopted.

This maintenance approach goes through a process, namely being hypothesised, anticipated, strategized, costed, and aptly transmitted to all concerned stakeholders, such that obsolescence issues have decreased in human settlements. Further analysis, as presented in Figures 5.19 and 5.20, illustrates the spread of choice of maintenance and the reason(s) for such decisions.

The 78% respondents in Nigeria who chose unplanned maintenance, as shown in Figure 5.19 indicated that other reasons such as bureaucracy, the lack of funds, an unwritten rule and a norm, account for the maintenance type used, and 33% stated that it was due to suitability, whereas 22% believed that it was a result of cost-effectiveness, time and the availability of personnel. Only 6% stated that it was a policy requirement. Others, Provinces are not involved in maintenance, owners are responsible.

Table 5. 28: Type of maintenance adopted for human settlements

Type of Maintenance	Nigeria		South Africa		Combined	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Unplanned Maintenance	18	6.6	18	17.6	36	7.4
Reactive Maintenance	232	85.0	70	68.6	302	61.9
Planned Corrective Maintenance	27	9.9	47	46.1	74	15.2
Planned Preventive Maintenance	25	9.2	39	38.2	64	13.1
Unaware	1	0.4	4	3.9	5	1.0
Unsure	0	0	5	4.9	5	1.0
Others	0	0	2	2.0	2	0.4
Total					488	100.0

Source: Researcher's Field Survey (2019)
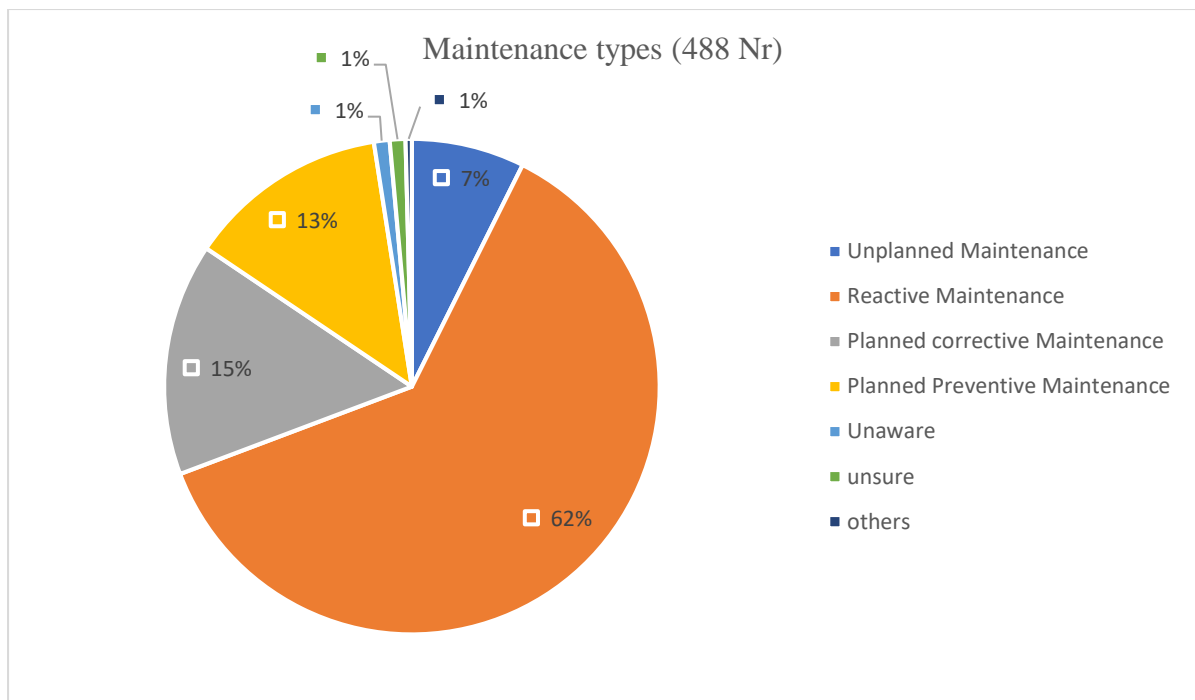
Figure 5. 18: Type of maintenance adopted

Source: Researcher's Analysis of Data (2019)
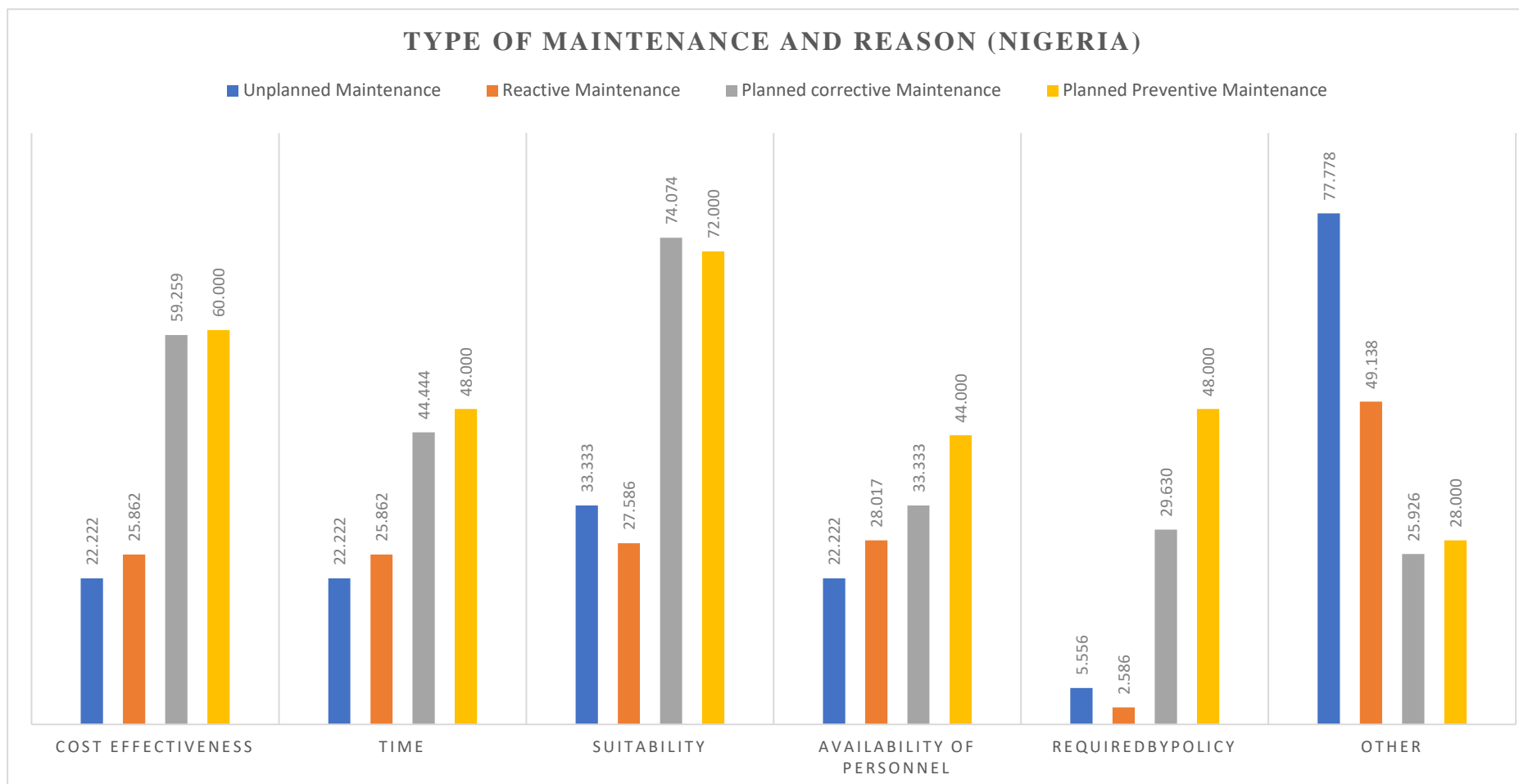
Figure 5. 19: Maintenance type used and reasons (Nigeria)

Source: Researcher's Analysis of Data (2019)
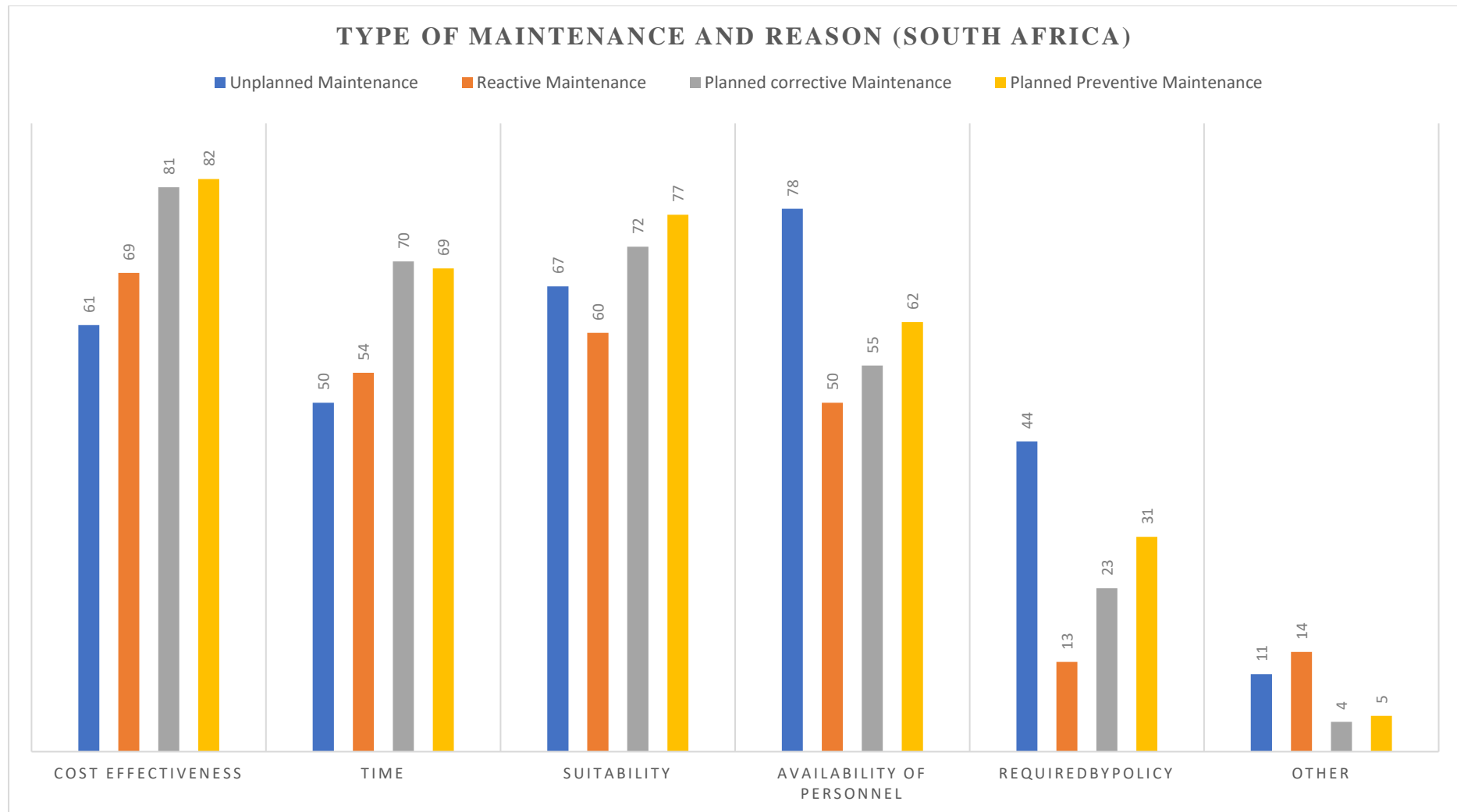
Figure 5. 20: Maintenance type used and reasons (South Africa)

Source: Researcher's Analysis of Data (2019)

Figure 5.20 which shows the South African respondents' analysis, indicates that more than 80% of the respondents disclosed that they adopted planned corrective and planned preventive maintenance, due to its cost-effectiveness, while 61% and 69% select the unplanned and reactive maintenance method for the same reason.

Table 5.29 shows that the Nigerian respondents indicated that all the respondents indicated that they adopted an unplanned maintenance approach. 22.86% (8 Nr) was for terraced bungalows, 31.34% (11 Nr) was for detached houses, 5.71% (2 Nr) was for condominiums, 37.14% (13 Nr) was for blocks of flats, and 2.86% (1 Nr) was for other. They further indicated that of the respondents who responded that the reactive maintenance approach was adopted, 29.86% (126 Nr) each was for terraced bungalows and detached houses, 6.40% (27 Nr) was for condominiums, 33.18% (140 Nr) was for blocks of flats and 0.71% (3 Nr) was for other.

For those who adopted the planned corrective maintenance approach, 29.55% (13 Nr) adopted it for terraced bungalows, 25% (11 Nr) for detached houses, 11.36% (5 Nr) for condominiums, 31.82% (14 Nr) for block of flats and 2.27% (1 Nr) for other. Of the respondents who adopted the planned preventive maintenance approach, however, 26.09% (12 Nr) each adopted it for terraced bungalows and detached houses, 17.39% (8 Nr) for condominiums, 28.26% (13 Nr) for blocks of flats and 2.17% (1 Nr) for other.

South African respondents as indicated in Table 5.29, showed that 7.14% (2 Nr) adopted the unplanned maintenance approach for terraced bungalows, 64.29% (18 Nr) represented those who used an unplanned maintenance approach for detached houses, 7.14% (2 Nr) adopted the same for condominiums, 17.88% (5 Nr) adopted the same for blocks of flats and 3.57% (1 Nr) was for other. The tables also indicated that of the respondents who responded, a reactive maintenance approach was adopted, as follows: 11.76% (12 Nr) was for terraced bungalows, 46.08% (47 Nr) was for detached houses, 5.88% (6 Nr) was for condominiums, 35.29% (36 Nr) was for block of flats and 0.98% (1 Nr) was for other.

In addition, for those who adopted a planned corrective maintenance approach, 16% (12 Nr) adopted it for terraced bungalows, 40% (30 Nr) for detached houses, 10.67% (8 Nr) for condominiums, 32% (24 Nr) for block of flats and 1.33% (1 Nr) for other. Of the respondents who adopted the planned preventive maintenance approach, however, 16.92% (11 Nr) adopted it for terraced bungalows, 33.85% (22 Nr) adopted it for detached houses, 6.15% (4 Nr) for condominiums and 43.08% (28 Nr) for blocks of flats.

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Table 5. 29: Maintenance type versus building type

Nigeria	Unplanned Maintenance		Reactive Maintenance		Planned corrective Maintenance		Planned Preventive		Planned		Unsure		Unaware		Other	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Terraced Bungalows	8	22.86	126	29.86	13	29.55	12	26.09	0	0.00	0	0.00	0	0.00
Detached Houses	11	31.43	126	29.86	11	25.00	12	26.09	0	0.00	0	0.00	0	0.00
Condominium	2	5.71	27	6.40	5	11.36	8	17.39	0	0.00	0	0.00	0	0.00
Block of flats	13	37.14	140	33.18	14	31.82	13	28.26	0	0.00	0	0.00	0	0.00
Other	1	2.86	3	0.71	1	2.27	1	2.17	0	0.00	0	0.00	0	0.00
South Africa	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Terraced Bungalows	2	7.14	12	11.76	12	16.00	11	16.92	0	0.00	0	0.00	0	0.00
Detached Houses	18	64.29	47	46.08	30	40.00	22	33.85	1	20.00	5	83.33	1	50.00
Condominium	2	7.14	6	5.88	8	10.67	4	6.15	0	0.00	0	0.00	0	0.00
Block of flats	5	17.86	36	35.29	24	32.00	28	43.08	3	60.00	1	16.67	0	0.00
Other	1	3.57	1	0.98	1	1.33	0	0.00	1	20.00	0	0.00	1	50.00

Source: Researcher's Field Survey (2019)

Similarly, Table 5.30 illustrates the cross-tabulation of the maintenance approach, versus the ownership type of the respondents' human settlements. For the Nigerian respondents, of all those that indicated unplanned maintenance approach, 17.6% (3 Nr) are privately owned human settlements, 11.8% (2 Nr) are owned by the local / municipal government, 58.8% (10 Nr) are owned by the province / state governments, 5.9% (1 Nr) each are owned by the national / federal government and public-private partnerships.

Also, of all those who indicated a reactive maintenance approach, 37% (80 Nr) are privately owned human settlements, 9.7% (21Nr) are owned by the local / municipal government, 29.2% (63 Nr) are owned by the province / state governments, 17.6% (38 Nr) are owned by the national / federal government and 5.6% (12 Nr) are owned by public / private partnerships while 0.9% (2 Nr) are unsure of the ownership. In addition, of those who indicated planned corrective maintenance, 50% (10 Nr) are private owners, 20% (4 Nr) are owned by the Local / Municipal Government while 15% (3 Nr) each, are owned by the Provincial / State government or are owned by a Public-Private Partnership.

Furthermore, of the respondents who indicated that they employ the planned preventive maintenance approach, 33.3% (6 Nr) were private, 16.75 (3 Nr) were owned by the Provincial / State governments while 50% (9 Nr) were owned by the Public-Private partnership. Only one respondent with ownership held by the local / municipal government was unaware of the maintenance approach adopted.

Also, of the South African respondents, of all those who indicated an unplanned maintenance approach, 78.6% (11 Nr) are owned by the local / municipal government, 7.1% (1 Nr) are owned by the province / state governments, 14.3% (2 Nr) are unsure about ownership status partnerships. Also, of all those who indicated a reactive maintenance approach, 45.9% (28 Nr) are privately owned human settlements, 36.1% (22 Nr) are owned by the local / municipal government, 9.8% (6 Nr) are owned by the province / state governments, 1.6% (1 Nr) are owned by the national / federal government and 3.3% (2 Nr) each are owned by public / private partnerships or are unsure of the ownership. In addition, of those who indicated planned corrective maintenance, 59.5% (25 Nr) are private owners, 26.2% (11 Nr) are owned by the Local / Municipal Government while 7.1% (3 Nr) each are owned by the Provincial / State government and Public-Private Partnerships.

Furthermore, of the respondents who indicated that they employ the planned preventive maintenance approach, 68.8% (22 Nr) were private, 12.5 (4% Nr) were owned by the local / municipal government, and 9.4% (3 Nr) each are owned by the Provincial / State governments and Public-Private partnerships.

Of the respondents who are unsure of the maintenance approach employed, one respondent each was owned by private and local / municipal government while two respondents were unsure of the ownership. Also, only two respondents each, whose human settlement owners

were the local / municipal government and state /provincial government, and one who was unsure of the owners was unaware of the maintenance approach being adopted.

Table 5. 30: Maintenance approach versus Ownership type

	Unplanned Maintenance		Reactive Maintenance		Planned corrective Maintenance		Preventive Maintenance		Planned		Unsure		Unaware		Other	
Nigeria	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Private	3	17.6	80	37.0	10	50.0	6	33.3	0	0.0	0	0.0	0	0.0
Local / Municipal Government	2	11.8	21	9.7	4	20.0	0	0.0	0	0.0	1	100.0	0	0.0
Provincial/Stats	10	58.8	63	29.2	3	15.0	3	16.7	0	0.0	0	0.0	0	0.0
National / Federal Government	1	5.9	38	17.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Public Private Partnership	1	5.9	12	5.6	3	15.0	9	50.0	0	0.0	0	0.0	0	0.0
Unsure	0	0.0	2	0.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
South Africa	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Private	0	0.0	28	45.9	25	59.5	22	68.8	1	25.0	0	0.0	1	50.0
Local / Municipal Government	11	78.6	22	36.1	11	26.2	4	12.5	1	25.0	2	40.0	0	0.0
Provincial/Stats	1	7.1	6	9.8	3	7.1	3	9.4	0	0.0	2	40.0	1	50.0
National / Federal Government	0	0.0	1	1.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Public Private Partnership	0	0.0	2	3.3	3	7.1	3	9.4	0	0.0	0	0.0	0	0.0
Unsure	2	14.3	2	3.3	0	0.0	0	0.0	2	50.0	1	20.0	0	0.0

Source: Researcher's Field Survey (2019)

As illustrated in Table 5.31, physical state and services have their highest mean value at the planned preventive maintenance approach, and the lowest mean value when using the unplanned maintenance approach except for the physical state of the South African human settlements which has its lowest when using the reactive maintenance approach.

Table 5. 31 Mean value of Physical state and services versus maintenance approach

	Physical State				Services			
	Mean	Median	Standard Deviation	Range	Mean	Median	Standard Deviation	Range
Nigeria								
Unplanned Maintenance	3.60	3.60	0.58	2.00	2.81	2.83	0.45	1.33
Reactive Maintenance	3.68	3.80	0.57	3.20	2.98	3.00	0.51	2.50
Planned Corrective Maintenance	3.71	3.60	0.62	2.40	3.56	3.67	0.80	3.17
Planned Preventive Maintenance	4.00	4.00	0.58	2.40	3.59	3.83	0.68	2.33
South Africa								
Unplanned Maintenance	3.96	3.80	0.66	2.20	3.59	3.67	0.59	2.50
Reactive Maintenance	3.77	3.80	0.68	3.40	3.67	3.83	0.70	3.33
Planned Corrective Maintenance	3.85	4.00	0.69	2.80	3.87	4.00	0.58	2.50
Planned Preventive Maintenance	4.05	4.00	0.48	2.00	4.10	4.00	0.46	2.00

Source: Researcher's Field Survey (2019)

5.4.4 Maintenance condition

This theme and the related question seek to evaluate the current maintenance conditions of the human settlements of the respondents. Earlier in Section 5.3.4 the various categories of conditions were highlighted as documented by The State of Queensland Department of Housing and Public Works (2017).

The analysed data as shown in Table 5.32 denotes that 42.4% (159 Nr) of the human settlements are considered to be in a fair condition, 34.1% (128 Nr) are deemed to be in good condition while 15.5% (58 Nr) is disclosed as being in poor condition. However, only 4.0% (15 Nr) are declared to be in a very good condition, and 2.1% (8 Nr) are described as being in a deplorable state.

Table 5. 32: Maintenance condition of human settlements

Maintenance condition	Nigeria		South Africa		Combined	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Very Poor	4	1.5	4	3.9	8	2.1
Poor	50	18.3	8	7.8	58	15.5
Fair	116	42.5	43	42.2	159	42.4
Good	89	32.6	39	38.2	128	34.1
Very Good	9	3.3	6	5.9	15	4.0
Total	268	98.2	100	98.0	368	98.1
Missing	5	1.8	2	2.0	7	1.9
Total	273	100.0	102	100	375	100.0

Source: Researcher's Field Survey (2019)

Further analytics, as illustrated in Table 5.33, shows that the mean value of the maintenance condition of the cases studied stood at 3.183 and 3.350 for Nigeria and South Africa, respectively.

The indication is that the conditions of the human settlements are fair.

Table 5. 33 Analytics & Computed Values on Maintenance condition of human settlements

Country	Mean	Standard deviation	Standard error	95% CI Lower bound	95% CI Upper bound	Nr
Nigeria	3.183	0.826	0.050	3.084	3.282	268
South Africa	3.350	0.869	0.087	3.180	3.520	100

Source: Researcher's Field Survey (2019)

Table 5.34 shows the cross-tabulation of maintenance conditions with the maintenance approach adopted. In Nigeria, examining the respondents who indicated that they adopted the unplanned maintenance approach, showed that; 5.6% (1 Nr) reported very poor and good maintenance conditions while 44.4% (8 Nr) each had poor and fair maintenance conditions. Of those that indicated that they adopted the reactive maintenance approach, 1.7% (4 Nr) reported very poor maintenance condition, 18.8% (43 Nr) reported poor maintenance conditions, 46.7% (107 Nr) had fair maintenance condition, 29.7% (68 Nr) reported a good maintenance condition and 3.1% (7 Nr) reported a very good maintenance condition.

In addition, concerning the respondents who specified that they had adopted planned corrective maintenance, 18.5% (5 Nr) indicated that their maintenance condition was poor, 29.6% (8 Nr) indicated that theirs was fair and 51.9% (14 Nr) indicated a good maintenance condition.

For the respondents who indicated that they employed the use of the planned preventive maintenance approach, 4.2% (1 Nr) indicated that their maintenance condition was poor, 20.8% (5 Nr) indicated that theirs was fair, 66.7% (16 Nr) indicated a good maintenance condition and 8.3% (2 Nr) indicated a very good maintenance condition.

In the case of South African respondents, as revealed in table 5.34, of those who indicated that they adopted the unplanned maintenance approach, 16.7% (3 Nr) reported very poor maintenance conditions, 11.1% (2 Nr) reported a poor maintenance conditions, 55.6% (10 Nr) reported a fair maintenance condition, and 16.7% (3 Nr) reported good maintenance conditions. In addition, of those that indicated that they adopted the reactive maintenance approach, 2.9% (2 Nr) reported a very poor maintenance condition, 7.4% (5 Nr) reported poor maintenance

conditions, 41.2% (28 Nr) reported a fair maintenance condition, 42.6% (29 Nr) reported a good maintenance condition and 5.9% (4 Nr) reported a very good maintenance condition.

Concerning the respondents who specified that they adopted the planned corrective maintenance, none reported very poor or poor, 37.8% (17 Nr) indicated that their maintenance condition was fair, 57.8% (26 Nr) indicated that theirs was good and 4.4% (42Nr) indicated very good maintenance condition. For the respondents who indicated that they employed the use of the planned preventive maintenance approach, none indicated that their maintenance condition was very poor nor poor, 28.9% (11 Nr) indicated that their maintenance condition was fair, 60.5% (23 Nr) indicated that theirs was good and 10.5% (4 Nr) indicated a very good maintenance condition.

Table 5. 34: Maintenance approach versus Maintenance condition

	Maintenance condition									
	Very Poor		Poor		Fair		Good		Very Good	
Nigeria	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Unplanned Maintenance	1	5.6	8	44.4	8	44.4	1	5.6	0	0.0
Reactive Maintenance	4	1.7	43	18.8	107	46.7	68	29.7	7	3.1
Planned corrective Maintenance	0	0.0	5	18.5	8	29.6	14	51.9	0	0.0
Planned Preventive Maintenance	0	0.0	1	4.2	5	20.8	16	66.7	2	8.3
Unsure	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unaware	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0
Other	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
South Africa	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Unplanned Maintenance	3	16.7	2	11.1	10	55.6	3	16.7	0	0.0
Reactive Maintenance	2	2.9	5	7.4	28	41.2	29	42.6	4	5.9
Planned corrective Maintenance	0	0.0	0	0.0	17	37.8	26	57.8	2	4.4
Planned Preventive Maintenance	0	0.0	0	0.0	11	28.9	23	60.5	4	10.5
Unsure	0	0.0	2	50.0	1	25.0	1	25.0	0	0.0
Unaware	1	20.0	1	20.0	3	60.0	0	0.0	0	0.0
Other	0	0.0	0	0.0	2	100.0	0	0.0	0	0.0

Source: Researcher's Field Survey (2019)

5.4.5 Level of completion of human settlements

In addition to the quantitative study in this theme, the level of completion of the human settlement was considered, that is whether it was uncompleted; partly completed and occupied; completed and unoccupied; completed and partly occupied or completed and fully occupied. Table 5.35 and Figure 5.21 shows that 80.8% (303 Nr) were completed and fully occupied, while 9.1% (34 Nr) were partly completed and occupied, and 4.5% (17 Nr) were completed and partly occupied. Whereas 2.9% (11 Nr) are completed and unoccupied, and only 0.8% (3 Nr) were others.

Table 5. 35: Level of completion of human settlement

Level of completion of human settlements	Nigeria		South Africa		Combined	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Partly completed and occupied	10	3.7	24	23.5	34	9.1
Completed and unoccupied	9	3.3	2	2.0	11	2.9
Completed and partly occupied	9	3.3	8	7.8	17	4.5
Completed and fully occupied	239	87.5	64	62.7	303	80.8
Other	1	0.4	2	2.0	3	0.8
Total	268	98.2	100	98.0	368	98.1
Missing	5	1.8	2	2.0	7	1.9
Total	**273**	**100.0**	**102**	**100.0**	**375**	**100.0**

Source: Researcher's Field Survey (2019)
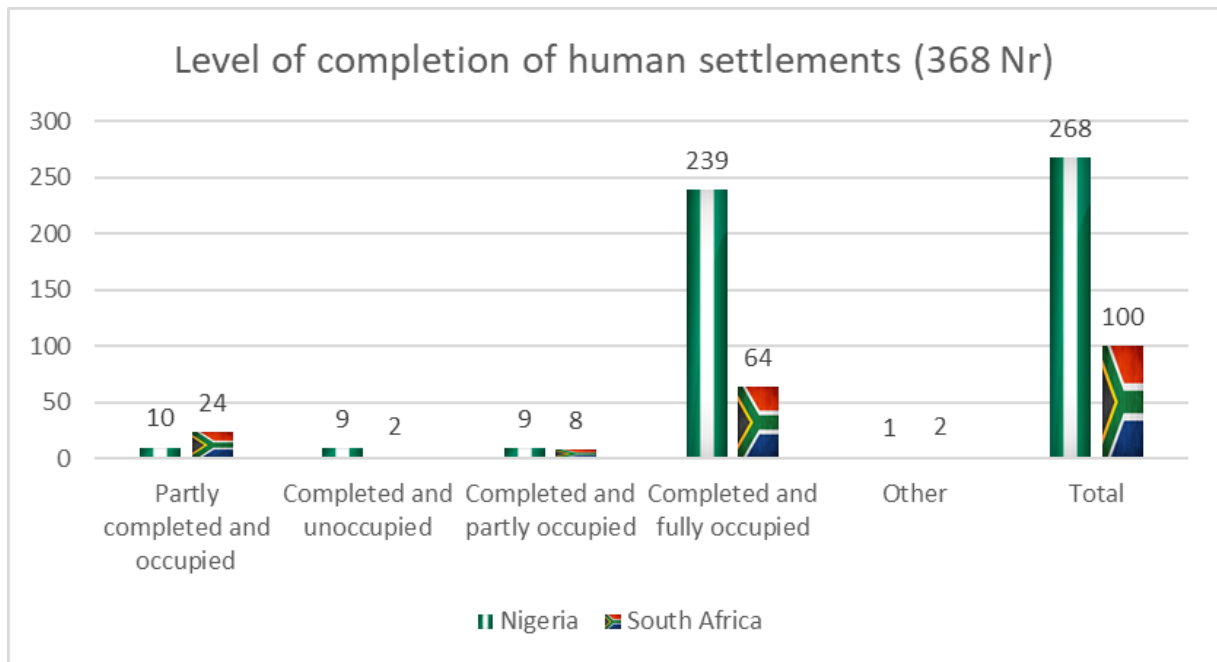
Figure 5. 21: Level of completion of human settlement

Source: Researcher's Analysis of Data (2019)

Table 5.36 shows the cross-tabulation of the responses between maintenance types and ownership.

Table 5. 36: Crosstabulation of maintenance types versus ownership type

	Unplanned Maintenance		Reactive Maintenance		Planned corrective Maintenance		Preventive Planned Maintenance		Unsure		Unaware		Other	
Nigeria	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Private	3	17.6	80	37.0	10	50.0	6	33.3	0	0.0	0	0.0	0	0.0
Local / Municipal Government	2	11.8	21	9.7	4	20.0	0	0.0	0	0.0	1	100.0	0	0.0
Provincial/Stats	10	58.8	63	29.2	3	15.0	3	16.7	0	0.0	0	0.0	0	0.0
National / Federal Government	1	5.9	38	17.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Public Private Partnership	1	5.9	12	5.6	3	15.0	9	50.0	0	0.0	0	0.0	0	0.0
Unsure	0	0.0	2	0.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
South Africa	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Private	0	0.0	28	45.9	25	59.5	22	68.8	1	25.0	0	0.0	1	50.0
Local / Municipal Government	1	78.6	22	36.1	11	26.2	4	12.5	1	25.0	2	40.0	0	0.0
Provincial/Stats	1	7.1	6	9.8	3	7.1	3	9.4	0	0.0	2	40.0	1	50.0
National / Federal Government	0	0.0	1	1.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Public Private Partnership	0	0.0	2	3.3	3	7.1	3	9.4	0	0.0	0	0.0	0	0.0
Unsure	2	14.3	2	3.3	0	0.0	0	0.0	2	50.0	1	20.0	0	0.0

Source: Researcher's Field Survey (2019)

5.5 Human Settlement Management Factors

This part presents the data analysis and discussions of results of the case study, to assess the factors that affect the human settlements management practices in Nigeria and in South Africa.

This section will help to identify the human settlement management elements that influence the management of human settlements in Nigeria and in South Africa.

The third objective of "assessing the various factors that affect human settlement management in Nigeria and in South Africa," will be addressed in the section and will help toward the development of a management model for human settlements.

The results of the data retrieved from the fieldwork will be analysed to provide a basis for a later discussion of the results, utilising cross-referencing to the evidence, based on the reviewed body of knowledge on this subject.

The main sub-objective of this section is:

- To identify, ascertain and evaluate the factors that affect human settlement management and the impact rates of such factors.

Question 19 of the field instrument provides the questions asked to investigate and to accomplish the sub-objective in this section.

5.5.1 Factors that affect human settlement management

This theme seeks to identify, authenticate and evaluate the factors and their rate of influence on human settlement management, as established by the results of the analysed data.

An exploration of this theme through the questionnaire survey identified maintenance management factors and their impact, as presented in Table 5.37.

The table reveals that the following were ranked high, comprising over 70% of the respondents from Nigeria, as affecting the management of human settlement by agreeing and strongly agreeing:

Non-implementation of policies showed (98.7%); motivation of management personnel showed (97.4%); lack of funds for management / maintenance activities showed (97.7%); training of management / maintenance personnel showed (97.4%); default in the payment of rents / rates / taxes was at (96.9%); lack of needs assessment showed (95.8%); the lack of

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maintenance records showed (99.6%); procurement management method of the organisation showed (96.6%); the lack of policy coordination showed (97.3%); fiscal policy of government showed (96.2%); adequate supervision of management and maintenance tasks showed (96.2%); incoherent policies(95.8%); maintenance policy of the organisation (96.2%); deficiency in policy monitoring showed (96.9%); weak government institutions were at (94.8%); standard operating procedure of management organisation showed (95.5%); breaches of covenant / contract by inhabitants were at (95.8%); continuous political patronage - (95.4%); unavailability of policy review - (96.6%); poor land use management model - (95.4%); dispute by inhabitants - (94.7%); conflict of interest of stakeholders - (94.3%); ownership status of the house / land was at (93.9%) ; - incessant political propaganda - (92.4%); job specialization - (92.3%); division of labour - (91.4%); absence of public participation - (91.6%); workplace hierarchy - (91.1%); - location of the settlement / estate (90.8%); - availability of spare part of infrastructure and equipment (90.6%); - poor education and literacy level of inhabitants - (89.4%); population density of the settlement / housing estate - (88.3%); lack of qualified personnel - (86.4%); size of land / expanse of settlement (85.2%); - presence of flood plains - (84.7%); existence of water bodies - (84.0%); natural drainage basin of the area - (83.2%); vegetation of the area - (82.8%); - soil texture of the area (82.1%); bad house designs - (81.2%); embezzlement of funds allocated for management / maintenance - (79.8%); software tools for maintenance activities - (79.6%) and greed of personnel involved in management / maintenance - (71.7%).

However, 16.3% (43 Nr) strongly agreed that the high-interest rate on funds affected the management of human settlements and 33.5% (88 Nr) agreed. 21.3% (56 Nr) were neutral / undecided that it had an effect and 19.8% - (52 Nr) disagreed that it affected the management, while 9.1% (24 Nr) strongly disagreed. In the case of elevation of the site, 34.2% (90 Nr) were neutral or undecided, and 30.8% (81 Nr) disagreed that it affected the settlement, while 24.7% (65 Nr) agreed that it did.

A further 9.1% (24 Nr) strongly agreed that it affected human settlements management, while a negligible 1.1% (3 Nr) agreed strongly. Regarding norms and tradition of inhabitants, 46.2% (122 Nr) strongly disagreed that it affected the management of human settlements and a further 25.0% (66 Nr) disagreed that it has an impact while 14.8% (39 Nr) however agreed. 11.4% (39 Nr) were neutral, and 2.7% (7 Nr) strongly agreed that it has influence. Regarding the ethnicity of inhabitants, 48.9% (129 Nr) strongly disagreed that it affected the management of human

settlements while an additional 25.4% (67 Nr) disagreed that it has an effect while 12.1% (32 Nr) were neutral.

However, 11.4% (30 Nr) agreed that it has an effect and 2.3% (6 Nr) strongly agreed that it had an effect.

Lastly, regarding religious beliefs of the inhabitants, 45.5% (120 Nr) strongly disagreed that it had an effect and a further 31.4% (83 Nr) disagreed, while 10.6% (28 Nr) and 11% (29 Nr) were neutral / undecided or agreed, respectively. An insignificant 1.5% (4 Nr) strongly agreed that it had an effect.

Regarding the South African respondents, Table 5.38 revealed that over 70% of the respondents agreed or strongly agreed that human settlement management is affected by the following:

Deficiency in policy monitoring (92.0%), fiscal policy of government (91.1%), the training of management / maintenance personnel (90.0%), procurement management method of the organisation (89.1%), incoherent policies (89.0%), a lack of needs assessment (88.9%), the lack of maintenance records (87.3%), adequate supervision of management and maintenance tasks (87.1%), motivation of management personnel (87.0%), non-implementation of policies (87.0%), the unavailability of policy review (87.0%), disputes between inhabitants (87.0%), standard operating procedure of management organisation (86.3%), a lack of policy coordination (86.1%), maintenance policy of the organisation (85.0%), the lack of funds for management / maintenance activities (84.2%), ownership status of the house / land (84.2%), location of the settlement / estate (83.0%), job specialization (82.4%), weak government institutions (82.2%), software tools for maintenance activities (82.2%), poor education and literacy level of inhabitants (81.2%), conflict of interest of stakeholders (81.0%), workplace hierarchy (80.4%), availability of spare part of infrastructure and equipment (80.2%), poor land use management model (80.2%), size of land / expanse of settlement (80.2%), population density of the settlement / housing estate (80.0%), absence of public participation (80.0%), continuous political patronage (80.0%), the lack of qualified personnel (79.2%), incessant political propaganda (77.2%), defaulting on the payment of rents / rates / taxes (76.2%), bad house designs (75.8%) and breach of covenant / contract by inhabitants (71.0%).

Table 5. 37: Factors affecting human settlement management (Nigeria)

Factors	Strongly Disagree		Disagree		Undecided / Neutral		Agree		Strongly Agree	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Lack of maintenance records	0	0.0	0	0.0	1	0.4	46	17.5	216	82.1
Lack of policy coordination	0	0.0	2	0.8	5	1.9	105	39.8	152	57.6
Unavailability of policy review	1	0.4	2	0.8	6	2.3	105	39.8	150	56.8
Deficiency in policy monitoring	0	0.0	2	0.8	6	2.3	105	40.1	149	56.9
Non-implementation of policies	1	0.4	1	0.4	4	1.5	112	42.4	146	55.3
Continuous political patronage	0	0.0	3	1.1	9	3.4	104	39.7	146	55.7
Motivation of management personnel	0	0.0	1	0.4	6	2.3	113	42.6	145	54.7
Lack of needs assessment	0	0.0	2	0.8	9	3.4	108	40.9	145	54.9
Incessant political propaganda	0	0.0	6	2.3	14	5.3	98	37.4	144	55.0
Absence of public participation	0	0.0	15	5.7	7	2.7	99	37.8	141	53.8
Breach of covenant / contract by inhabitants	0	0.0	4	1.5	7	2.7	112	42.7	139	53.1
Poor land use management model	0	0.0	6	2.3	6	2.3	114	43.3	137	52.1
Weak government institutions	0	0.0	6	2.2	8	3.0	118	44.2	135	50.6
Incoherent policies	0	0.0	2	0.8	9	3.4	120	45.3	134	50.6
Bad house designs	2	0.8	18	6.9	29	11.2	81	31.2	130	50.0
Default in the payment of rents / rates / taxes	0	0.0	3	1.1	5	1.9	127	48.5	127	48.5
Standard operating procedure of management organisation	2	0.7	2	0.7	8	3.0	132	49.3	124	46.3
Poor education and literacy level of inhabitants	5	1.9	9	3.4	14	5.3	114	43.0	123	46.4
Population density of the settlement / housing estate	10	3.8	18	6.8	3	1.1	113	42.8	120	45.5
Conflict of interest of stakeholders	0	0.0	2	0.8	13	5.0	128	48.9	119	45.4
Size of land / expanse of settlement	0	0.0	24	9.1	15	5.7	107	40.7	117	44.5
Lack of funds for management / maintenance activities	1	0.4	0	0.0	5	1.9	143	54.0	116	43.8
Fiscal policy of government	0	0.0	3	1.1	7	2.6	140	52.8	115	43.4

Table continuation										
Training of management / maintenance personnel	0	0.0	3	1.1	4	1.5	147	55.5	111	41.9
Dispute by inhabitants	0	0.0	2	0.8	12	4.6	140	53.4	108	41.2
Ownership status of the house / Land	0	0.0	9	3.4	7	2.7	141	53.6	106	40.3
Location of the settlement / estate	0	0.0	16	6.1	8	3.1	145	55.3	93	35.5
Adequate supervision of management and maintenance tasks	0	0.0	8	3.0	2	0.8	163	61.5	92	34.7
Procurement management method of the organisation	0	0.0	0	0.0	9	3.4	166	62.9	89	33.7
Maintenance policy of the organisation	2	0.8	6	2.3	2	0.8	173	65.5	81	30.7
Lack of qualified personnel	2	0.8	5	1.9	29	11.0	158	59.8	70	26.5
Job specialization	0	0.0	13	4.8	8	3.0	181	66.8	69	25.5
Greed of personnel involved in management / maintenance	9	3.4	20	7.5	46	17.4	124	46.8	66	24.9
Availability of spare part of infrastructure and equipment	1	0.4	1	0.4	23	8.7	174	65.7	66	24.9
Embezzlement of funds allocated for management / maintenance	5	1.9	16	6.0	33	12.4	149	55.8	64	24.0
Workplace hierarchy	4	1.5	11	4.1	9	3.3	185	68.3	62	22.9
Bribery	2	0.7	24	9.0	57	21.3	122	45.7	62	23.2
Division of labour	3	1.1	3	1.1	17	6.3	191	71.3	54	20.1
Software tools for maintenance activities	1	0.4	4	1.5	49	18.5	165	62.3	46	17.4
Vegetation of the area	0	0.0	18	6.9	27	10.3	171	65.3	46	17.6
Natural drainage basin of the area	0	0.0	15	5.7	29	11.1	174	66.4	44	16.8
High interest rate on funds	24	9.1	52	19.8	56	21.3	88	33.5	43	16.3
Presence of flood plains	0	0.0	15	5.7	25	9.6	182	69.7	39	14.9
Soil texture of the area	0	0.0	18	6.9	29	11.1	176	67.2	39	14.9
Existence of water bodies	0	0.0	17	6.5	25	9.5	186	70.7	35	13.3
Elevation of the site	3	1.1	81	30.8	90	34.2	65	24.7	24	9.1
Norms and tradition of inhabitants	122	46.2	66	25.0	30	11.4	39	14.8	7	2.7
Ethnicity of inhabitants	129	48.9	67	25.4	32	12.1	30	11.4	6	2.3
Religious belief of the inhabitants	120	45.5	83	31.4	28	10.6	29	11.0	4	1.5

Source: Researcher's Field Survey (2019)

Table 5. 38: Factors affecting human settlement management (South Africa)

Elements	Strongly Disagree		Disagree		Undecided / Neutral		Agree		Strongly Agree	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Dispute by inhabitants	0	0.0	4	4.0	9	9.0	27	27.0	60	60.0
Lack of maintenance records	1	1.0	3	3.0	9	8.8	33	32.4	56	54.9
Conflict of interest of stakeholders	1	1.0	7	7.0	11	11.0	26	26.0	55	55.0
Population density of the settlement / housing estate	1	1.0	7	7.0	12	12.0	30	30.0	50	50.0
Fiscal policy of government	0	0.0	0	0.0	9	8.9	45	44.6	47	46.5
Standard operating procedure of management organisation	0	0.0	3	2.94	11	10.78	43	42.16	45	44.12
Lack of funds for management / maintenance activities	1	1.0	5	5.0	10	10.0	42	42.0	43	43.0
Location of the settlement / estate	0	0.0	6	6.0	11	11.0	40	40.0	43	43.0
Weak government institutions	1	1.0	8	8.0	9	9.0	41	41.0	42	42.0
Training of management / maintenance personnel	1	1.0	2	2.0	7	7.0	48	48.0	42	42.0
Poor education and literacy level of inhabitants	1	1.0	10	10.0	8	8.0	41	41.0	41	41.0
Absence of public participation	2	2.0	9	9.0	9	9.0	39	39.0	41	41.0
Maintenance policy of the organisation	0	0.0	6	6.0	9	9.0	46	46.0	39	39.0
Motivation of management personnel	0	0.0	4	4.0	9	9.0	49	49.0	38	38.0
Default in the payment of rents / rates / taxes	1	1.0	9	9.0	14	14.0	40	40.0	37	37.0
Lack of qualified personnel	0	0.0	9	9.0	12	12.0	43	43.0	36	36.0
Adequate supervision of management and maintenance tasks	2	2.0	2	2.0	9	8.9	52	51.5	36	35.6
Lack of needs assessment	1	1.0	1	1.0	9	9.1	53	53.5	35	35.4
Procurement management method of the organisation	0	0.0	2	2.0	9	8.9	58	57.4	32	31.7
Size of land / expanse of settlement	2	2.0	2	2.0	16	15.8	49	48.5	32	31.7
Workplace hierarchy	3	2.9	4	3.9	13	12.8	51	50.0	31	30.4
Poor land use management model	2	2.0	6	5.9	12	11.9	51	50.5	30	29.7
Ownership status of the house / Land	0	0	5	5.0	11	10.9	55	54.5	30	29.6
Job specialization	1	1.0	10	9.8	7	6.9	55	53.9	29	28.4
Bad house designs	1	1.0	15	15.2	8	8.0	46	46.5	29	29.3
Availability of spare part of infrastructure and equipment	0	0.0	4	4.0	16	16.0	55	55.0	26	26.0
Non-implementation of policies	1	1.0	1	1.0	11	11.0	62	62.0	25	25.0
Lack of policy coordination	1	1.0	4	4.0	9	8.9	63	62.4	24	24.0
Continuous political patronage	0	0.0	5.0	5.0	15	15.0	57	57.0	23	23.0
Incessant political propaganda	0	0.0	6.0	6.0	17	17.0	55	55.0	23	23.0

Incoherent policies	1	1.0	2.0	2.0	8	8.0	67	67.0	22	22.0
Unavailability of policy review	1	1.0	4.0	4.0	8	8.0	65	65.0	22	22.0
Deficiency in policy monitoring	0	0.0	4.0	4.0	4	4.0	71	71.0	21	21.0
Breach of covenant / contract by inhabitants	2	2.0	7	7.0	20	20.0	51	51.0	20	20.0
Software tools for maintenance activities	0	0.0	4	4.0	14	13.8	64	63.5	19	18.7
High interest rate on funds	4	4.0	9	8.9	24	23.8	53	52.5	11	10.8
Division of labour	6	5.9	15	14.9	28	27.7	45	44.6	7	6.9
Greed of personnel involved in management / maintenance	38	38.0	13	13.0	27	27.0	16	16.0	6	6.0
Embezzlement of funds allocated for management / maintenance	34	33.7	16	15.8	23	22.8	23	22.8	5	4.9
Soil texture of the area	1	1.0	40	40.0	21	21.0	33	33.0	5	5.0
Bribery	31	30.6	15	14.9	31	30.7	20	19.8	4	4.0
Elevation of the site	2	2.0	38	38.8	26	26.6	28	28.6	4	4.0
Natural drainage basin of the area	3	3.0	39	38.6	20	19.8	35	34.6	4	4.0
Presence of flood plains	2	2.0	38	38.0	18	18.0	38	38.0	4	4.0
Ethnicity of inhabitants	36	36.0	23	23.0	20	20.0	18	18.0	3	3.0
Norms and tradition of inhabitants	31	30.7	18	17.8	16	15.8	33	32.7	3	3.0
Existence of water bodies	1	1.0	36	36.0	27	27.0	33	33.0	3	3.0
Religious belief of the inhabitants	37	36.5	25	24.8	25	24.8	12	11.9	2	2.0
Vegetation of the area	1	1.0	36	35.6	24	23.8	39	38.6	1	1.0

Source: Researcher's Field Survey (2019)

High-interest rate on funds showed a strongly agree and agreed with a figure of 63.4% while the division of labour reflected 51.5% for the same response. However, division of labour, presence of flood plains, vegetation of the area, natural drainage basin of the area, soil texture of the area, existence of water bodies, norms and tradition of the inhabitants, elevation of the site, embezzlement of funds allocated for management / maintenance, bribery, greed of personnel, involved in management / maintenance, ethnicity of inhabitants and religious belief of the inhabitants showed a level of 60% and above for strongly disagree, disagree and neutral categories. Table 5.39 reveals a ranking of the elements that affect human settlement management and lack of maintenance records, namely; lack of policy coordination and deficiency in policy monitoring ranks numbers one, two and three respectively in Nigeria, while disputes by inhabitants, fiscal policy of government and lack of maintenance records rank one, two and three in South Africa. However, norms and tradition of the inhabitants, the ethnicity of inhabitants and religious beliefs of the inhabitants ranked the least in Nigeria while religious beliefs of the inhabitants, ethnicity of the inhabitants and greed of personnel involved

in management / maintenance ranked the lowest in South Africa. It can be deduced from this that these elements have a lesser effect on the management of human settlement than is generally indicated. When the two cases were merged, lack of maintenance records, motivation of management personnel and lack of needs assessments ranked as the three highest factors influencing the management of human settlements, while norms and traditions of inhabitants, ethnicity of inhabitants and religious beliefs of the inhabitants ranked as the last three factors with the lowest mean values.

Table 5. 39: Ranking of factors affecting human settlement management

Factors	Nigeria	South Africa	Average mean	Ranking
Work-place hierarchy	4.07	4.01	4.05	34
Job specialization	4.13	3.99	4.09	32
Division of labour	4.08	3.32	3.87	36
Standard operating procedure of management organisation	4.40	4.27	4.36	10
Weak government institutions	4.43	4.14	4.35	13
Bribery	3.82	2.51	3.46	43
Conflict of interest of stakeholders	4.39	4.27	4.36	10
Embezzlement of funds allocated for management / maintenance	3.94	2.50	3.54	42
The greed of personnel involved in management / maintenance	3.82	2.39	3.43	44
Lack of funds for management / maintenance activities	4.41	4.20	4.35	13
High interest rate on funds	3.28	3.57	3.36	45
Fiscal policy of the government	4.38	4.38	4.38	7
Poor education and literacy level of inhabitants	4.29	4.10	4.23	25
Ethnicity of inhabitants	1.93	2.29	2.03	48
Norms and tradition of inhabitants	2.03	2.59	2.18	47
Population density of the settlement/housing estate	4.19	4.21	4.20	27
The religious belief of the inhabitants	1.92	2.18	1.99	49
Maintenance policy of the organisation	4.23	4.18	4.22	26
The procurement management method of the organisation	4.30	4.19	4.27	22
Lack of qualified personnel	4.09	4.06	4.09	33
Adequate supervision of management and maintenance tasks	4.28	4.17	4.25	23

Table continuation

Training of management / maintenance personnel	4.38	4.28	4.35	13
Availability of spare part of infrastructure and equipment	4.14	4.02	4.11	31
Motivation of management personnel	4.52	4.21	4.43	2
Software tools for maintenance activities	3.95	3.97	3.95	35
Lack of needs assessment	4.50	4.21	4.42	3
Incoherent policies	4.46	4.07	4.35	13
Non-implementation of policies	4.52	4.09	4.40	5
Lack of policy coordination	4.54	4.04	4.40	5
Deficiency in policy monitoring	4.53	4.09	4.41	4
Unavailability of policy review	4.52	4.03	4.38	7
Continuous political patronage	4.50	3.98	4.36	10
Incessant political propaganda	4.45	3.94	4.31	19
Bad house designs	4.23	3.88	4.13	30
Poor land use management model	4.45	4.00	4.33	17
Absence of public participation	4.40	4.08	4.31	19
Size of land / expanse of settlement	4.21	4.06	4.16	29
Elevation of the site	3.10	2.94	3.06	46
The natural drainage basin of the area	3.94	2.98	3.67	39
Presence of flood plains	3.94	3.04	3.69	37
Existence of water bodies	3.91	3.01	3.66	40
Soil texture of the area	3.90	3.01	3.65	41
Vegetation of the area	3.94	3.03	3.68	38
Location of the settlement/estate	4.20	4.20	4.20	27
Ownership status of the house / Land	4.31	4.09	4.25	23
Breach of covenant / contract by inhabitants	4.47	3.80	4.29	21
Default in the payment of rents / rates / taxes	4.44	4.02	4.33	17
Dispute by inhabitants	4.35	4.43	4.37	9
Lack of maintenance records	4.82	4.37	4.69	1

Source: Researcher's Field Survey (2019)

5.5.2 Factor analysis

Yin (2013) articulated the difficulty in the task of examining the generated data about a subject under investigation but, Saunders, Lewis & Thornhill (2008) expressed that it is, however, vital to prove the consistency and the reliability of the research findings and conclusions of a study.

Even though result variation was a function of the sample size, this study opined that the first step to analyse gathered data was to test for data consistency and reliability. The procedure aided in confirming whether all the data in the questionnaire was consistent and evaluated the same underlying construct. Initially, the factorability of the forty-nine (49) items was tested using several well-recognised criteria for the factorability of a correlation and all had a minimum of 0.3 correlation, and this signifies reasonable factorability.

The Kaiser-Meyer-Olkin measure of sampling adequacy was also 0.88 which is above the recommended value of 0.6, and Bartlett's test of sphericity was significant (χ^2 (1176) = 11135.910, p < 0.001). Finally, the communalities were more than 0.3 (see Table 5.40), further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was conducted with all 49 questions. Since the primary purpose was to identify and compute composite management factors, principle components analysis was used for the underlying factors. The initial eigenvalues indicated that the first factor explained 26.44 of the variance, the second factor 11.85 of the variance, and a third and fourth factor of 5.17 and 5.06 of the variance respectively. The fifth had eigenvalue of 4.15, sixth 3.58, seventh 3.34, eighth 2.89, ninth 2.411, tenth 2.29 while the eleventh had 2.21. Using both varimax and oblimin rotations of the factor loading matrix, the eleven-factor solution, which explained 69.39% of the variance, was preferred because of its previous theoretical support. Although cross-loadings were present for some of the factors, all items had primary loadings of over 0.3. for the items with cross-loadings, either the highest loading or that which made theoretical interpretation was retained.

The factor loading matrix for this final solution is shown in Table 5.40. The factors identified by Burges and Van Wyk suited the extracted factors and were retained.

Cronbach's alpha was used in examining internal consistency for each of the scales, and the alphas were above the recommended value of 0.7 except for technological factor – 0.931 for Policy / Political Factors (8 items), 0.918 for Environmental Factors (6 items), 0.841 for Physical Factors (6 items), 0.824 for Organisational Factors (6 items), 0.892 for Socio-cultural Factors (3 items), 0.788 for Human Resource Factors (5 items), 0.919 for Ethical / Moral Factors (3 items), 0.748 for Socio-economic Factors (6 items), 0.742 for legal Factors (3 items) and 0.566 for Technological Factors (2 items) (see Table 5.40).

The macro-economic factor was discarded as it was loading on only one item and literature indicates that it could be due to a low number of questions, poor interrelatedness between items

or heterogenous constructs. The technological factor was retained because it was loading on two items. No significant increases in alpha could have been reached by excluding more items for any of the scales. Also, composite scores were generated for each of the ten (10) retained factors, based on their means, which had their primary loadings on each factor.

Table 5.40: Factors loadings and communalities based on principle component analysis with oblimin rotation for 48 items from the management of human settlements (N = 377)

	Political / Policy	Environmental	Physical	Organisational	Socio-cultural	Human resource	Ethical / Moral	Socio-Economic	Legal	Technological	Macro-economic	Communality
Q19 - Work place hierarchy						0.714						0.667
Q19 - Job specialization						0.774						0.758
Q19 - Division of labour						0.511	0.397					0.565
Q19 - Standard operating procedure of management organisation						0.593						0.570
Q19 - Weak government institutions	0.318					0.587						0.624
Q19 - Bribery							0.836					0.796
Q19 - Conflict of interest of stakeholders	0.309				0.392			0.324				0.522
Q19 - Embezzlement of funds allocated for management / maintenance		0.324					0.868					0.896
Q19 - Greed of personnel involved in management / maintenance		0.341					0.839					0.858
Q19 - Lack of funds for management / maintenance activities								0.489				0.513
Q19 - High interest rate on funds					-0.323						0.630	0.663
Q19 - Fiscal policy of government								0.611				0.601
Q19 - Poor education and literacy level of inhabitants								0.775				0.711
Q19 - Ethnicity of inhabitants					-0.862							0.815
Q19 - Norms and tradition of inhabitants					-0.857							0.798
Q19 - Population density of the settlement / housing estate								0.582				0.576
Q19 - Religious belief of the inhabitants					-0.880							0.810
Q19 - Maintenance policy of the organisation				0.552				0.353				0.590
Q19 - Procurement management method of the organisation				0.633				0.303				0.609
Q19 - Lack of qualified personnel				0.488				0.354	0.334			0.565
Q19 - Adequate supervision of management and maintenance tasks				0.754								0.715
Q19 - Training of management / maintenance personnel				0.723								0.678

Table continuation

Q19 - Availability of spare part of infrastructure and equipment				0.344					0.579		0.570
Q19 - Motivation of management personnel	0.342			0.469							0.561
Q19 - Software tools for maintenance activities									0.750		0.665
Q19 - Lack of needs assessment	0.645										0.589
Q19 - Incoherent policies	0.829										0.800
Q19 - Non-implementation of policies	0.853										0.825
Q19 - Lack of policy coordination	0.825										0.802
Q19 - Deficiency in policy monitoring	0.841										0.823
Q19 - Unavailability of policy review	0.794										0.764
Q19 - Continuous political patronage	0.686									-0.303	0.699
Q19 - Incessant political propaganda	0.528									-0.443	0.690
Q19 - Bad house designs			0.698								0.672
Q19 - Poor land use management model	0.336		0.603								0.659
Q19 - Absence of public participation	0.315		0.608								0.701
Q19 - Size of the land / expanse of settlement			0.671								0.672
Q19 - Elevation of the site		0.598									0.476
Q19 - Natural drainage basin of the area		0.847									0.817
Q19 - Presence of flood plains		0.895									0.868
Q19 - Existence of water bodies		0.858									0.832
Q19 - Soil texture of the area		0.861									0.851
Q19 - Vegetation of the area		0.844									0.816
Q19 - Location of the settlement /estate			0.660								0.755
Q19 - Ownership status of the house / Land			0.642								0.680
Q19 - Breach of covenant/contract by inhabitants									0.682		0.684
Q19 - Default in the payment of rents / rates / taxes									0.744		0.700
Q19 - Dispute by inhabitants								0.407	0.371		0.510
Q19 - Lack of maintenance records	0.315				0.322				0.553		0.618

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 12 iterations. Factor loading < .3 are suppressed.

Table 5.41 shows the descriptive statistics of factors influencing human settlements management. It reveals that the majority of the respondents agreed on average that Political / Policy factors ($\overline{x}$ = 4.373; SD = 0.567), environmental factors ($\overline{x}$ = 3.570 ; SD = 0.760), Physical factors ($\overline{x}$ = 4.299 ; SD = 0.632), Organisational factors ($\overline{x}$ = 4.265 ; SD = 0.494), Human resource factors ($\overline{x}$ = 4.140; SD = 0.575), Ethical / Moral factors ($\overline{x}$ = 3.477; SD = 1.120), Socio-Economic factors ($\overline{x}$ = 4.311; SD = 0.524), Legal factors ($\overline{x}$ = 4.427; SD = 0.598) and Technological factors ($\overline{x}$ = 4.031; SD = 0.555) influence human settlement management while they disagreed that Socio-cultural factors ($\overline{x}$ = 2.071; SD = 1.120) has an influence.

Table 5.41: Descriptive analysis of the distribution of responses for human settlement management factors

Factors	Nr. of Items	N	Missing	Mean	Median	Std. Deviation	Range	Minimum	Maximum	Alpha
Political / Policy	8	366	9	4.373	4.375	0.567	3.500	1.500	5.000	0.931
Environmental	6	364	11	3.570	3.833	0.760	4.000	1.000	5.000	0.918
Physical	6	364	11	4.229	4.333	0.632	3.500	1.500	5.000	0.841
Organisational	6	367	8	4.265	4.333	0.494	2.667	2.333	5.000	0.824
Socio-cultural	3	366	9	2.071	2.000	1.057	4.000	1.000	5.000	0.892
Human resource	5	373	2	4.140	4.200	0.575	3.000	2.000	5.000	0.792
Ethical / Moral	3	368	7	3.477	4.000	1.120	4.000	1.000	5.000	0.919
Socio-Economic	6	369	6	4.311	4.333	0.524	2.667	2.333	5.000	0.748
Legal	6	366	9	4.427	4.667	0.598	4.000	1.000	5.000	0.742
Technological	2	367	8	4.031	4.000	0.555	3.000	2.000	5.000	0.566

Source: Researcher's Field Survey (2019)

An independent-samples t-test was conducted, to compare differences in the responses for each factor by the case studies, and the results are presented in Table 5.42. There was a significant difference in the scores for political and policy factors, Nigeria (M=4.496, SD=0.516) and South Africa (M = 4.051, SD = 0.572); t (364) = 7.151, p = 0.0001, Cohen's d = 0.817 (large

effect size). This result indicates that Nigeria views this factor to have more influence on human settlements management than South Africa.

The responses for environmental factors also indicate there was a significant difference in Nigeria (M=3.787, SD=0.601) and South Africa (M = 3.002, SD = 0.835); t (141.638) = 8.633, p = 0.0001, Cohen's d = 1.080 (large effect size). The indication is that Nigeria participants evaluated this factor higher than the South African participants.

The feedback for physical factors as an influence in human settlements management also showed that there was a significant difference with Nigeria (M=4.299, SD=0.581) and South Africa (M = 4.046, SD = 0.719); t (152.846) = 3.168, p = 0.002, Cohen's d = 0.388 (small effect size) hence meaning that the factor was evaluated higher by the Nigerian participants.

The difference in the responses from the two countries on organisational factors were not significant as table 5.42 reveals Nigeria (M=4.300, SD=0.427) and South Africa (M = 4.173, SD = 0.632); t (136.218) = 1.861, p = 0.065). The indication of this is that the pattern of responses from the two participant case studies was not different regarding the influence of organisational factors on human settlement management.

As Table 5.42 further shows, the two case studies have significant difference in their responses as to the influence of socio-cultural factors in human settlement management, Nigeria (M=1.963, SD= 1.032) and South Africa (M = 2.356, SD = 1.074); t (364.000) = -3.225, p = 0.001, Cohen's d = 0.371 (small effect size). The negative t-value indicates a reversal in the directionality of the effect, which has no bearing on the significance of the difference between groups, hence there is a small significant difference in the pattern of responses, as to the influence of socio-cultural factors on human settlement management.

Furthermore, the values of Nigeria (M=4.214, SD= 0.517) and South Africa (M = 3.943, SD = 0.670); t (148.537) = 3.689, p = 0.001, Cohen's d = 0.452 (small effect size) indicates that there is a significant difference in the responses of the participants as to the influence of human resource factors on human settlement management. The Nigerian participants rated the influence of this factor higher than that of their South African counterparts.

Further evidence, as revealed in table 5.42, shows that ethical and moral factors responses from the two countries were significantly different. Nigeria (M=3.858, SD= 0.807) and South Africa (M = 2.469, SD = 1.208); t (135.168) = 10.698, p = 0.001, Cohen's d = 1.353 (large effect size). The implication of this is that Nigerian participants rated ethical and moral factors as an

influence in human settlement management higher than the ratings of the South African participants.

Table 5.42: Independent Samples T-Tests for Country Comparisons

Factors	Country	N	Mean	Std. Deviation	Std. Error Mean	F	p-value (variance)	t	df	p-value	Cohen's d
Political / Policy	Nigeria	265	4.496	0.516	0.032	2.148	0.144	7.151	364.000	0.000	0.817
	South Africa	101	4.051	0.572	0.057						
Environmental	Nigeria	263	3.787	0.601	0.037	29.704	0.000	8.633	141.638	0.000	1.080
	South Africa	101	3.002	0.835	0.083						
Physical	Nigeria	263	4.299	0.581	0.036	4.970	0.026	3.168	152.846	0.002	0.388
	South Africa	101	4.046	0.719	0.071						
Organisational	Nigeria	266	4.300	0.427	0.026	22.026	0.000	1.861	136.218	0.065	N/A
	South Africa	101	4.173	0.632	0.063						
Socio-cultural	Nigeria	265	1.963	1.032	0.063	2.534	0.112	-3.225	364.000	0.001	0.374
	South Africa	101	2.356	1.074	0.107						
Human resource	Nigeria	271	4.214	0.517	0.031	9.451	0.002	3.689	148.537	0.000	0.452
	South Africa	102	3.943	0.670	0.066						
Ethical / Moral	Nigeria	267	3.858	0.807	0.049	52.594	0.000	10.698	135.168	0.000	1.353
	South Africa	101	2.469	1.208	0.120						
Socio-Economic	Nigeria	267	4.333	0.454	0.028	37.790	0.000	1.075	137.670	0.284	N/A
	South Africa	102	4.255	0.673	0.067						
Legal	Nigeria	264	4.576	0.420	0.026	43.224	0.000	6.462	123.660	0.000	0.842
	South Africa	102	4.042	0.791	0.078						
Technological	Nigeria	266	4.045	0.528	0.032	2.659	0.104	0.771	365.000	0.441	N/A
	South Africa	101	3.995	0.622	0.062						

Interestingly, Table 5.42 indicates that there is no significant difference in the response of the participants, as to the influence of the socio-economic factor on human settlements management. Nigeria has (M=4.333, SD=0.454) and South Africa (M = 4.255, SD = 0.673); t (137.670) = 1.075, p = 0.284).

Legal factor has values of Nigeria (M=4.576, SD= 0.420) and South Africa (M = 4.042, SD = 0.791); t (123.660) = 6.642, p = 0.001, Cohen's d = 0.842 (large effect size) and this indicates a significant difference in the response of the participants on the influence of legal factors on human settlement management, with Nigerian participants rating it higher.

Finally, Table 5.42 also showed that there was no significant difference in the response of the participant on the influence technological factors have on human settlement management. Nigeria (M=4.045, SD= 0.528) and South Africa (M = 3.995, SD = 0.622); t (365.000) = 0.771, p = 0.441.

5.6 Human Settlements Sustainability Issues

This theme investigates the effects that essential sustainability factors have on the management of human settlements and assesses whether their integration will hence be beneficial. This section will help to ascertain the factors that influence sustainable human settlement management in Nigeria and in South Africa. The third second objective of "identifying and evaluating factors that are beneficial to the sustainable management of human settlements in Nigeria and in South Africa" will also be addressed here and it will help with answering the research question - are there critical sustainability factors that are necessary for the sustainability of human settlements? Data retrieved from the fieldwork will be analysed, to provide a basis for later discussion of the results, utilising cross-referencing to the evidence, based on the reviewed body of knowledge in this subject.

The main sub-objectives of this section are:

- To ascertain the knowledgeability of the respondents on the concept of sustainability and sustainable development / management;
- To establish the significance of sustainability in the effective management of human settlements; and
- To identify, ascertain and evaluate the factors that affect sustainable management of human settlements and the impact rates of such factors.

Section D (that is Questions 20, 21, 22, 23 and 24) of the field instrument examines and provide answers to the sub-objectives in this section.

This section applied the same procedures and instruments as were used in the preceding sections of this study, in analysing the data for results.

5.6.1 Awareness and understanding of sustainability in human settlements management practice

This theme seeks to investigate the awareness and the understanding of the concept, sustainability and sustainable development in the management of human settlements and it stems from the Brundtland report which underscores that: "all development must be that which meets the needs of the present generation without endangering the ability of the future generations to meet their own needs".

Table 5.43 shows the results of the respondents where 89.6% (336 Nr) claimed that they were aware of the issues and concept of sustainability whereas 6.7% (25 Nr) indicated that they were not aware and 3.2% (12 Nr) were unsure while 0.5% (2 Nr) did not respond.

Table 5.44 also reveals same range of responses when the respondents were asked if they had an understanding of the concept of sustainable development and management with 88.8% (333 Nr) expressing that they understood the concept whereas 6.1% (23 Nr) disclosed that they were not aware and 4.0% (15 Nr) were unsure while 1.1% (24 Nr) were missing. The pattern of response in the case studies was not also different for the two questions.

Table 5.43: Awareness of sustainability concept and issues in human settlements management.

Awareness of the issues and concept of sustainability	Nigeria		South Africa		Combined	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	245	89.7	91	89.2	336	89.6
No	19	7.0	6	5.9	25	6.7
Unsure	7	2.6	5	4.9	12	3.2
Missing	2	0.7	0	0	2	0.5
Total	273	100.0	102	100	375	100.0

Source: Researcher's Field Survey (2019)

Table 5.44: Understanding of the concept of sustainable development and management.

Understanding the concept of sustainable development	Nigeria		South Africa		Combined	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	239	87.5	94	92.2	333	88.8
No	19	7.0	4	3.9	23	6.1
Unsure	12	4.4	3	2.9	15	4.0
Missing	3	1.1	1.00	1.0	4	1.1
Total	273	100.0	102	100.0	375	100.0

Source: Researcher's Field Survey (2019)

In a further investigation of the degree of awareness and understanding of the concept of sustainable development and management within the context of human settlements management, Table 5.45 reveals that out of the three hundred and seventy-five (375) responses in the survey, 52.3% (196 Nr) were rated as having a good awareness and understanding, whereas 21.3% (80 Nr) were rated as having a very good level of awareness and understanding and 14.9% (24 Nr) were rated as having a fair level of awareness and understanding. 5.9% (22 Nr) were rated as having a poor level of awareness and understanding, and only 4.3% (16 Nr) were rated as having an excellent level of awareness and understanding while 1.3% (5 Nr) did not respond. The result reveals that a large percentage of the respondents are aware and knowledgeable about the concept of human development and management.

Table 5.45: Rating of the awareness and understanding of the concept of sustainable development / management

Rating of the awareness and the understanding of the concept of sustainable development / management	Nigeria		South Africa		Combined	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Poor	18	6.6	4.0	3.9	22	5.9
Fair	37	13.6	19.0	18.6	56	14.9
Good	161	59.0	35.0	34.3	196	52.3
Very Good	44	16.1	36.0	35.3	80	21.3
Excellent	11	4.0	5.0	4.9	16	4.3
Total	271	99.3	99.0	97.1	370	98.7
Missing	2	0.7	3.0	2.9	5	1.3
Total	273	100.0	102.0	100.0	375	100.0

Source: Researcher's Field Survey (2019)

5.6.2 Significance of the concept of sustainability to the management of human settlements

This theme aims to establish the significance of the concept of sustainability in the effective management of human settlements.

Table 5.46 indicates that 89.6% (336 Nr) were positive that sustainability concepts were significant for the management of human settlements, while 2.4% (9 Nr) were negative and that 7.2% (27 Nr) were unsure. This result validates that the sustainability concept in human settlement management was vital for achieving the goals and aims of any human settlement.

Table 5. 46: Significance of the concept of sustainability to the management of human settlements

Significance of the concept of sustainability to the management of human settlements	Nigeria		South Africa		Combined	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	242	88.6	94.0	92.2	336	89.6
No	6	2.2	3.0	2.9	9	2.4
Unsure	23	8.4	4.0	3.9	27	7.2
Missing	2	0.7	1.0	1.0	3	0.8
Total	**273**	**100**	**102**	**100**	**375**	**100**

Source: Researcher's Field Survey (2019)

5.6.3 Factors that influence sustainable management of human settlements

This theme seeks to ascertain whether: human capital factors; environmental factors; social factors; technology factors and legal factors; are vital for sustainable management of human settlements.

For the Nigerian respondents, examination of inhabitants' income, as indicated in Table 5.47 shows that 0.4% (1 Nr) of the respondents strongly disagreed that it has an influence, while 1.5% (4 Nr) disagreed that it has an influence and 2.2% (6 Nr) were undecided or neutral. 66.7% (180 Nr) agreed that it has an influence and 29.3% (79 Nr) strongly agreed that it has an influence. The mean score of 4.23 as indicated in Table 5.47 confirms that it has a high level of significance and ranks 10[th] among the factors with influence on sustainable management of human settlements.

The assessment of the ages of inhabitants as shown in Table 5.47, reveals that 1.5% (4 Nr) of the respondents strongly disagreed that it has an influence on sustainable human settlement management in Nigeria, 14.6% (39 Nr) disagreed that it has an influence and 19.0% (51 Nr) were undecided or neutral. 50.5% (134 Nr) agreed that it has an influence and 14.9% (40 Nr) strongly agreed that it has an influence. With a mean score of 3.62, the factor ranked 23rd among the factors influencing sustainable management of human settlements. The education level of inhabitants showed 0.4% (1 Nr) strongly disagreeing that it has an influence on the sustainable management of human settlements and 1.5% (4 Nr) disagreed that it influenced them while 3.4% (9 Nr) were neutral or undecided. Whereas, 48.5% (129 Nr) agreed, and 46.2% (123 Nr) strongly agreed that it has an influence. The factor has a mean score of 4.39 and ranked 8th (see Table 5.47). Interestingly, the education level of management personnel showed a combined cumulative result of 96.6%, agreeing and strongly agreeing to confirm that it has a significant influence on the sustainable management of human settlements as compared to 3.4% of the respondents who disagreed or were undecided on its influence on promoting sustainable management of human settlements. The factor was ranked 4th with a mean score of 4.47 (see Table 5.47).

There is a remarkable result in the technology used in management exercise; as Table 5.47 revealed that no one strongly disagreed that it had an influence, whereas 0.8% (2 Nr) disagreed that it had an influence and 1.9% (5 Nr) were undecided or neutral. Another 41.9% (111 Nr) agreed that it had an influence and 55.5% (147 Nr) strongly agreed that it had an influence. This factor ranked the third among the factors, with a strong influence and a mean score of 4.52. The influence of professional expertise involved in the sustainable management of human settlement also ranked 4th, as shown in Table 5.47, and it indicated that none of the respondents strongly disagreed that it influenced them, while 0.4% (1 Nr) disagreed and 1.9% (5 Nr) were neutral or undecided. However, 48.5% (128 Nr) agreed, and 49.2% (130 Nr) strongly agreed that it had influence. This factor also has a mean score of 4.47.

The population density of human settlements ranked 6th with a mean score of 4.43, as illustrated in Table 5.47 and the table revealed that it showed a cumulative result of 96.6% and confirmed that it has a significant influence, as compared with 3.4% who disagreed or were undecided on its influence to promote sustainable management. As further indicated in Table 5.47, 0.4 (1 Nr) of the respondents strongly disagreed that the scale of unemployment has an influence and 10.6% (28 Nr) disagreed while 18.1% (48 Nr) were undecided or neutral. Furthermore, 55.5%

(147 Nr) agreed, and 15.5% (41 Nr) strongly agreed that it has an influence. The item ranked 22nd, with a mean score of 3.75.

The item of the policy framework for management / maintenance had no one strongly disagreeing about its influence on sustainable human settlement management, and 0.8% (2 Nr) disagreed while 3.0% (8 Nr) were undecided or neutral. Also, 52.1% (138 Nr) agreed, and 44.2% (111 Nr) strongly agreed that it has an influence. With a mean score of 4.40, the item ranked 7th, as revealed in Table 5.47. As can be seen further from Table 5.47, tenure of inhabitants' as an influence on the sustainable management of human settlements was at 0.4% (1 Nr) strongly disagreeing, 5.3% (14 Nr) disagreeing, 20.8% (55 Nr) undecided or neutral, 59.8% (158 Nr) agreeing and 13.6% (36 Nr) strongly agreeing. The item ranked 21st, with a mean score of 3.81. Additionally, from the data in Table 5.47, it is apparent that the item of title deed / documentation has the least influence on sustainable management of human settlements, with a ranking of 25 and a mean score of 3.40. 0.8% (2 Nr) strongly disagreed that it has an influence and 14.4% (38 Nr) disagreed, while 38.8% (102 Nr) were undecided or neutral, whereas 35.7% (94 Nr) and 10.3% (27 Nr) agreed and agreed strongly respectively.

Moreover, 0.4% (1 Nr) of the participants strongly disagreed that community participation influences the sustainable management of human settlements while 3.8% (10 Nr) disagreed and 4.6% (12 Nr) were undecided or neutral. 43.7% (115 Nr) agreed that it has an influence and 47.5% (125 Nr) strongly agreed. With a mean score of 4.34 it is ranked 9th among the factors. In the same vein as illustrated in Table 5.47, the security of tenure which ranks 14th with a mean score of 4.13 has 0.4% (1 Nr) of the participants strongly disagreeing that it has an influence, while 1.5% (4 Nr) disagreed and 7.6% (20 Nr) were undecided or neutral. 65.3% (171 Nr) agreed that it has an influence and 25.2% (66 Nr) strongly agreed.

The survey results as additionally indicated in Table 5.47 showed that none of the respondents strongly disagreed that the social status of the inhabitants influenced sustainable management of human settlements, while 3.5% (9 Nr) disagreed and 5.0% (13 Nr) were undecided or neutral. 73.8% (192 Nr) agreeing and 17.7% (36 Nr) strongly agreeing that it does influence sustainable management of human settlements and thus, it ranked 15th among the factors, with a score of 4.06. Occupation of inhabitants also ranked 15th as illustrated in Table 5.47 has a mean score of 4.06 and confirms that it has a significant influence, as compared with 6.5% of disagreeing or being undecided on its influence to stimulate sustainable management of human settlements. Likewise, the safety of life and property as a factor that influences sustainable

management of human settlement ranked eighth with a mean score of 4.16 which showed that it has a significant influence.

Table 5.47 discloses that none of the respondents strongly disagreed that the social justice system of the community influenced sustainable human settlement management, but 1.9% (5 Nr) disagreed whereas 3.1% (8 Nr) were neutral or undecided. However, 72.8% (190 Nr) agreed that it influences them while 22.2% (58 Nr) strongly agreed and it is ranked 13th among other factors, with a mean score of 4.15. The available landmass, which also ranked 11th, has a mean score of 4.16, which affirms that it influenced the sustainable management of human settlements. Elevation / topography of the area as indicated in Table 5.47 also has 0.4% (1 Nr) strongly disagreeing that it influences the sustainable management of human settlements and 14.9% (39 Nr) disagreeing while 37.8% (99 Nr) were undecided or neutral. 36.6% (96 Nr) agreed that it influences sustainable management of human settlements, while 10.3% (27 Nr) strongly agreed. The score was 3.42, and the item was ranked 24th among other items of influence.

The survey results as further suggested in Table 5.47 showed that none of the respondents strongly disagreed that flood plains and slopes influenced sustainable management of human settlements, while 5.3% (14 Nr) disagreed and 11.5% (30 Nr) were undecided or neutral. 72.1% (189 Nr) agreed and 11.1% (29 Nr) strongly agreed that it does motivate sustainable management of human settlements and it ranked 20th among the items, with a mean score of 3.89. A cumulative 84.4% of the respondents agreed or strongly agreed that the presence of water bodies influenced the sustainable management of human settlements, so it is ranked 19th with a mean score of 3.90 while a cumulative 84% agreed or strongly agreed that soil texture and quality influenced sustainable management of human settlements and it is ranked 18th, with a mean score of 3.92. The item of natural vegetation also has a mean value of 4.01 with a ranking of 17. The technology used in building as shown in Table 5.47, revealed that none of the respondents strongly disagreed that it influences sustainable human settlement management in Nigeria, while 0.8% (2 Nr) disagreed that it has an influence and 1.9% (5 Nr) were undecided or neutral. 35.5% (93 Nr) agreed that it has an influence and 61.8% (162 Nr) strongly agreed that it has an influence. The mean score of 4.58 confirmed this factor and it ranked 2nd amongst the factors influencing sustainable management of human settlements. Finally, the last item in the survey results in Table 5.47 showed that none of the respondents strongly disagreed that time available for management and maintenance influences sustainable management of human settlements, while 0.4% (1 Nr) disagreed and 1.5% (4 Nr) were undecided or neutral. With

33.0% (86 Nr) agreeing and 65.1% (170 Nr) strongly agreeing that it does sustainably influence the management of human settlements and ranks first among the items, with a mean value of 4.63.

Table 5. 47: Factors influencing sustainable human settlement management (Nigeria)

Factors affecting sustainable human settlement management	Strongly Disagree		Disagree		Undecided / Neutral		Agree		Strongly Agree		Mean score	Ranking
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%		
Inhabitants income	1	0.4	4	1.5	6	2.2	180	66.7	79	29.3	4.23	10
Age grade of inhabitants	4	1.5	39	14.6	51	19.0	134	50.0	40	14.9	3.62	23
Education level of inhabitants	1	0.4	4	1.5	9	3.4	129	48.5	123	46.2	4.39	8
Education level of management personnel	0	0.0	3	1.1	6	2.3	119	44.9	137	51.7	4.47	4
Technology used in management exercise	0	0.0	2	0.8	5	1.9	111	41.9	147	55.5	4.52	3
Professional expertise involved in the management exercise	0	0.0	1	0.4	5	1.9	128	48.5	130	49.2	4.47	4
Population density of the settlement	0	0.0	2	0.8	7	2.6	132	49.8	124	46.8	4.43	6
Scale of unemployment	1	0.4	28	10.6	48	18.1	147	55.5	41	15.5	3.75	22
Policy framework for management / maintenance	0	0.0	2	0.8	8	3.0	138	52.1	117	44.2	4.40	7
Tenure of the inhabitants	1	0.4	14	5.3	55	20.8	158	59.8	36	13.6	3.81	21
Title deed / documentation	2	0.8	38	14.4	102	38.8	94	35.7	27	10.3	3.40	25
Community participation	1	0.4	10	3.8	12	4.6	115	43.7	125	47.5	4.34	9
Security of tenure	1	0.4	4	1.5	20	7.6	171	65.3	66	25.2	4.13	14
Social status of the inhabitants	0	0.0	9	3.5	13	5.0	192	73.8	46	17.7	4.06	15
Occupation of inhabitants	0	0.0	4	1.5	13	5.0	207	79.0	38	14.5	4.06	15
Safety of life and property	0	0.0	1	0.4	11	4.2	195	74.4	55	21.0	4.16	11
Social justice system of the community	0	0.0	5	1.9	8	3.1	190	72.8	58	22.2	4.15	13
Available land mass	0	0.0	12	4.6	13	5.0	158	60.5	78	29.9	4.16	11
Elevation / topography of the area	1	0.4	39	14.9	99	37.8	96	36.6	27	10.3	3.42	24
Flood plains and slopes	0	0.0	14	5.3	30	11.5	189	72.1	29	11.1	3.89	20
Presence of water bodies in the area	0	0.0	14	5.3	27	10.3	193	73.7	28	10.7	3.90	19
Soil texture and quality	0	0.0	12	4.6	30	11.5	186	71.0	34	13.0	3.92	18
Natural vegetation of the area	0	0.0	9	3.4	23	8.8	186	71.0	44	16.8	4.01	17
Technology used in building	0	0.0	2	0.8	5	1.9	93	35.5	162	61.8	4.58	2
Time available for management and maintenance	0	0.0	1	0.4	4	1.5	86	33.0	170	65.1	4.63	1

Source: Researcher's Field Survey (2019)

For the South African respondents, the results showing inhabitants' income as indicated in Table 5.48, shows that 2.9% (3 Nr) of the respondents strongly disagreed that it has an influence, while 1.0% (1 Nr) disagreed that it has an influence and 3.9% (4 Nr) were undecided or neutral. 43.1% (44 Nr) agreed that it has an influence and 49.0% (50 Nr) strongly agreed that it has an influence. The mean value for this factor is 4.34 and it was ranked 9th among the factors, with an influence on sustainable management of human settlements.

The age grade of inhabitants as shown in Table 5.48 revealed that 2.0% (2 Nr) of the respondents strongly disagreed that it has an influence on sustainable human settlement management in South Africa, 30.7% (31 Nr) disagreed that it has an influence and 14.9% (15 Nr) were undecided or neutral. 38.6% (39 Nr) agreed that it has an influence and 13.9% (14 Nr) strongly agreed that it has an influence. With a mean value of 3.32, the factor ranked 18th among the factors influencing the sustainable management of human settlements.

The education level of inhabitants has 2.0% (2 Nr) strongly disagreeing that it has an influence on sustainable management of human settlements and 3.0% (3 Nr) disagreed that it influences them, while 7.9% (8 Nr) were neutral or undecided. Whereas, 40.6% (41 Nr) agreed, and 46.5% (47 Nr) strongly agreed that it has an influence. The mean value of 4.27 showed that the education level of the inhabitants has a significant influence to promote sustainable management of human settlement and it ranked 10th (see Table 5.48). Another item that is relatable to the preceding item, education level of management personnel has a mean value of 4.39, confirming that it has a significant influence on the sustainable management of human settlements and the factor was ranked 6th (see Table 5.48).

The technology used in management shown in Table 5.48 revealed that 2.0% (2 Nr) each strongly disagreed or disagreed that it had an influence, whereas 6.9% (7 Nr) were undecided or neutral and 32.4% (33 Nr) were in agreement that it had an influence while 56.9% (58 Nr) strongly agreed that it had an influence. This item ranked 4th among the factors, thus showing a strong influence on sustainable management of human settlements and it had a mean value of 4.40.

The influence of professional expertise involved in the sustainable management of human settlement ranked 6th, as shown in Table 5.48, and it indicated that 1.0% (1 Nr) either strongly disagreed or disagreed that it had an influence, while 7.0% (7 Nr) were neutral or undecided and 36.0% (36 Nr) agreed; while 55.0% (55 Nr) strongly agreed that it had an influence. This factor ranked 3rd among the other factors, with a mean score of 4.43.

Population density of human settlement which ranked 8th as illustrated in Table 5.48 has a mean value of 4.36. As further indicated in Table 5.48, none of the respondents strongly disagreed or disagreed that the scale of unemployment has an influence, and 7.9% (8 Nr) were undecided or neutral. Furthermore, 46.5% (47 Nr) agreed, and 45.5% (46 Nr) strongly agreed that it has an influence and the factor ranked 7th, with a mean value of 4.38. The item of the policy framework for management / maintenance had no one strongly disagreeing about its influence on sustainable human settlement management, and 3.0% (3 Nr) disagreed, while 6.9% (7 Nr) were undecided or neutral. Also, 41.6% (42 Nr) agreed, and 48.5% (49 Nr) strongly agreed that it has an influence. With a mean value of 4.36, the item ranked 8th, as revealed in Table 5.48.

As further revealed in Table 5.48, length of tenure of inhabitants' as an influence on the sustainable management of human settlements showed 1.0% (1 Nr) strongly disagreeing, 16.7% (17 Nr) disagreeing, 19.6% (20 Nr) undecided or neutral, 46.1% (47 Nr) agreeing and 16.7% (17 Nr) strongly agreeing. The item ranked 17th, with a mean value of 3.61. Furthermore, from the data in Table 5.48, it is evident that the item of title deed / documentation has a low influence on sustainable management of human settlements with 14.9% (15 Nr) strongly disagreed that it has an influence, and 23.8% (24 Nr) disagreed while 21.8% (22 Nr) were undecided or neutral, whereas 29.7% (30 Nr) and 9.9% (10 Nr) agreed and agreed strongly, respectively. The factor ranked 25, with a mean value of 2.96.

Moreover, none of the participants strongly disagreed that community participation influences the sustainable management of human settlements, while 6.0% (6 Nr) disagreed and 4.0% (4 Nr) were undecided or neutral. 34.0% (34 Nr) agreed that it has an influence and 56.0% (56 Nr) strongly agreed. With a mean value of 4.40 and a ranking of 4th, this is an indication that community participation has a strong influence on sustainable management of human settlements. In the same vein, as illustrated in table 5.48, security of tenure ranked 16th with a mean value of 3.93 had 1.0% (1 Nr) of the participant strongly disagreeing that it has an influence, while 9.9% (10 Nr) disagreed and 7.9% (8 Nr) were undecided or neutral. 57.4% (58 Nr) agreed that it has an influence and 23.8% (24 Nr) strongly agreed. The survey results as indicated in Table 5.48 showed that none of the respondents strongly disagreed that social status of the inhabitants influences sustainable management of human settlements, while 3.0% (3 Nr) disagreed and 13.9% (14 Nr) were undecided or neutral. 56.4% (57 Nr) agreed and 26.7% (27 Nr) strongly agreed that it did influence sustainable management of human settlements and it ranked 14th among the items, with a mean value of 4.07. Occupation of inhabitants which ranked 11th, as shown in Table 5.48, has a mean value of 4.23. Likewise, the

safety of life and property was shown as a factor that influences sustainable management of human settlement with a ranking of 13th, with a mean score of 4.11, showing that it has a significant influence. Table 5.48 disclosed that none of the respondents strongly disagreed that the social justice system of the community influenced sustainable human settlement management, but 4.0% (4 Nr) disagreed whereas 8.9% (9 Nr) were neutral or undecided. However, 67.3% (68 Nr) agreed that it has an influence while 19.7% (20 Nr) strongly agreed and it is ranked 15th among other factors with a mean value of 4.03. The available landmass, which also ranked 12th, has a mean score of 4.18.

Elevation / topography of the area, as indicated in Table 5.48, has a 2.0% (2 Nr) strongly disagreeing that it influences the sustainable management of human settlements and 33.0% (33 Nr) disagreed, while 26.0% (26 Nr) were undecided or neutral. 34.0% (34 Nr) agreed that it influences the sustainable management of human settlements while 5% (5 Nr) strongly agreed. With a mean score of 3.07, the item was ranked 22nd among other items. The survey results as suggested in Table 5.48, showed that 3.0% (3 Nr) strongly disagreed that flood plains and slopes influence the sustainable management of human settlements, while 28.7% (29 Nr) disagreed and 21.8% (22 Nr) were undecided or neutral. 36.6% (37 Nr) agreed and 9.9% (10 Nr) strongly agreed that it does stimulate the sustainable management of human settlements and ranked 19th among the items, with a mean score of 3.22.

A cumulative average of 46.0% of the respondents agreed or strongly agreed that the presence of water bodies influences the sustainable management of human settlements and it is ranked 20th, with a mean score of 3.15, while a cumulative 43.6% agreed or strongly agreed that soil texture and quality influence the sustainable management of human settlements and is ranked 24, with a mean score of 3.06. Natural vegetation also has a mean score of 3.09 and ranks 21st. The technology used in building, as shown in Table 5.48 ranked first with a mean score of 4.50. None of the respondents strongly disagreed that it influences sustainable human settlement management in South Africa, while 2.0% (2 Nr) disagreed that it has an influence and 5.0% (5 Nr) were undecided or neutral. 34.7% (35 Nr) agreed that it has an influence and 58.4% (59 Nr) strongly agreed that it has an influence. Lastly, none of the respondents strongly disagreed that time available for management and maintenance influences sustainable management of human settlements, while 2.0% (2 Nr) disagreed and 6.0% (6 Nr) were undecided or neutral. With 34.0% (34 Nr) agreed and 58.0% (58 Nr) strongly agreed that time does sustainably influence the management of human settlements. The factor has a mean score of 4.48 and ranks 2nd among the items.

Table 5. 48: Factors influencing sustainable human settlement management (South Africa)

Factors affecting sustainable human settlement management	Strongly Disagree		Disagree		Undecided / Neutral		Agree (1)		Strongly Agree (2)		Mean score	Ranking
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%		
Inhabitants income	3	2.9	1	1.0	4	3.9	44	43.1	50	49.0	4.34	9
Age grade of inhabitants	2	2.0	31	30.7	15	14.9	39	38.6	14	13.9	3.32	18
Education level of inhabitants	2	2.0	3	3.0	8	7.9	41	40.6	47	46.5	4.27	10
Education level of management personnel	2	2.0	3	2.9	7	6.9	31	30.4	59	57.8	4.39	6
Technology used in management exercise	2	2.0	2	2.0	7	6.9	33	32.4	58	56.9	4.40	4
Professional expertise involved in the management exercise	1	1.0	1	1.0	7	7.0	36	36.0	55	55.0	4.43	3
Population density of the settlement	1	1.0	1	1.0	7	6.9	44	43.1	49	48.0	4.36	8
Scale of unemployment	0	0.0	0	0.0	8	7.9	47	46.5	46	45.5	4.38	7
Policy framework for management / maintenance	0	0.0	3	3.0	7	6.9	42	41.6	49	48.5	4.36	8
Tenure of the inhabitants	1	1.0	17	16.7	20	19.6	47	46.1	17	16.7	3.61	17
Title deed / documentation	15	14.9	24	23.8	22	21.8	30	29.7	10	9.9	2.96	25
Community participation	0	0.0	6	6.0	4	4.0	34	34.0	56	56.0	4.40	4
Security of tenure	1	1.0	10	9.9	8	7.9	58	57.4	24	23.8	3.93	16
Social status of the inhabitants	0	0.0	3	3.0	14	13.9	57	56.4	27	26.7	4.07	14
Occupation of inhabitants	0	0.0	1	1.0	11	10.9	53	52.5	36	35.6	4.23	11
Safety of life and property	0	0.0	5	5.0	5	5.0	65	64.4	26	25.7	4.11	13
Social justice system of the community	0	0.0	4	4.0	9	8.9	68	67.3	20	19.8	4.03	15
Available land mass	1	1.0	4	4.0	9	9.0	48	48.0	38	38.0	4.18	12
Elevation / topography of the area	2	2.0	33	33.0	26	26.0	34	34.0	5	5.0	3.07	22
Flood plains and slopes	3	3.0	29	28.7	22	21.8	37	36.6	10	9.9	3.22	19
Presence of water bodies in the area	3	3.0	32	32.0	19	19.0	39	39.0	7	7.0	3.15	20
Soil texture and quality	3	3.0	36	35.6	18	17.8	40	39.6	4	4.0	3.06	24
Natural vegetation of the area	3	3.0	33	33.0	20	20.0	40	40.0	4	4.0	3.09	21
Technology used in building	0	0.0	2	2.0	5	5.0	35	34.7	59	58.4	4.50	1
Time available for management and maintenance	0	0.0	2	2.0	6	6.0	34	34.0	58	58.0	4.48	2

Source: Researcher's Field Survey (2019)

Table 5.49 revealed a ranking of the elements that affect sustainable management of human settlements. When the two cases were merged; time available for management, the technology used in building and the technology used in management ranked as the three highest factors influencing the sustainable management of human settlements, while the age grade of inhabitants, elevation / topography of the area and norms and title deed / documentation ranked as the last three factors with the lowest mean values.

Table 5. 49: Ranking of factors affecting sustainable management of human settlements

Sustainable management of human settlement is affected by:	Nigeria	South Africa	Overall	Ranking
Inhabitants' income	4.23	4.34	4.26	10
Age grade of inhabitants	3.62	3.32	3.54	23
The education level of inhabitants	4.39	4.27	4.35	9
Education level of management personnel	4.47	4.39	4.45	5
The technology used in exercising management	4.52	4.40	4.49	3
Professional expertise involved in the management exercise	4.47	4.43	4.46	4
Population density of the settlement	4.43	4.36	4.41	6
Scale of unemployment	3.75	4.38	3.92	17
Policy framework for management / maintenance	4.40	4.36	4.39	7
Tenure of the inhabitants	3.81	3.61	3.75	19
Title deed / documentation	3.40	2.96	3.28	25
Community participation	4.34	4.40	4.36	8
Security of tenure	4.13	3.93	4.08	15
Social status of the inhabitants	4.06	4.07	4.06	16
Occupation of inhabitants	4.06	4.23	4.11	14
Safety of life and property	4.16	4.11	4.15	12
The social justice system of the community	4.15	4.03	4.12	13
Available land mass	4.16	4.18	4.16	11
Elevation / topography of the area	3.42	3.07	3.32	24
Flood plains and slopes	3.89	3.22	3.70	20
Presence of water bodies in the area	3.90	3.15	3.69	21
Soil texture and quality	3.92	3.06	3.68	22
Natural vegetation of the area	4.01	3.09	3.76	18
The technology used in building	4.58	4.50	4.56	2
Time available for management and maintenance	4.63	4.48	4.59	1

Source: Researcher's Field Survey (2019)

5.6.4 Factor analysis

Primarily, the factorability of the twenty-five (25) elements was tested, using numerous standard criteria for the factorability of a correlation and all had a minimum of a 0.3 correlation, and this signifies reasonable factorability. Also, the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.87, which is above the recommended value of 0.6, and Bartlett's test of sphericity was significant ($\chi 2$ (300) = 4659.895, p < 0.001). Finally, the communalities were more than 0.3 (see Table 5.50), further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was conducted with all twenty-five (25) questions.

Since the primary purpose was to identify and compute composite management factors, principle components analysis was used for the underlying factors. The initial eigenvalues indicated that the first factor explained 28.75% of the variance, the second factor 16.40% of the variance, and a third and fourth factor of 7.55% and 5.17% of the variance, respectively while the fifth had eigenvalues of 4.36%. Using both varimax and oblimin rotations of the factor loading matrix, the five-factor solution, which explained 62.22% of the variance, was preferred, because of its previous theoretical support.

Although cross-loadings were present for some of the factors, all items had primary loadings of over 0.3. for the items with cross-loadings, either the highest loading or that which made theoretical interpretation was retained. The factor loading matrix for this final solution is shown in Table 5.49.

The factor identified by Burges and Van Wyk suited the extracted factors and was retained. Cronbach's alpha was used in examining internal consistency for each of the scales, and the alphas were above the recommended value of 0.7, except for the legal factor – 0.886 for Human capital Factors (8 items), 0.910 for Environmental Factors (5 items), 0.784 for Socio-economic Factors (6 items), 0.738 for Technological Factors (3 items) and 0.540 for legal Factors (3 items) (see Table 5.49). No significant increases in alpha could have been reached by excluding more items from any of the scales.

Also, composite scores were generated for each of the five (5) retained factors, based on their means, which had their primary loadings on each factor.

Table 5. 50: Factors loadings and communalities, based on principle component analysis with oblimin rotation for twenty-five (25) items, from sustainable management of human settlements (N = 377)

	Human capital	Environmental	Socio-economic	Technological	Legal	Communalities
Q27 - Inhabitants income	0.340		0.631			0.522
Q27 - Age grade of inhabitants		0.386				0.250
Q27 - Education level of inhabitants	0.654		0.346			0.561
Q27 - Education level of management personnel	0.783					0.683
Q27 - Technology used in management exercise	0.848					0.762
Q27 - Professional expertise involved in the management exercise	0.794					0.691
Q27 - Population density of the settlement	0.714					0.582
Q27 - Scale of unemployment			0.588			0.389
Q27 - Policy framework for management / maintenance	0.669					0.536
Q27 - Tenure of the inhabitants					0.826	0.719
Q27 - Title deed / documentation		0.514			0.468	0.532
Q27 - Community participation	0.577			0.434		0.548
Q27 - Security of tenure					0.688	0.594
Q27 - Social status of the inhabitants			0.667			0.576
Q27 - Occupation of inhabitants			0.774			0.671
Q27 - Safety of life and property			0.649	0.358		0.600
Q27 - Social justice system of the community	0.314		0.578	0.335		0.594
Q27 - Available landmass	0.341			0.470		0.438
Q27 – Elevation / topography of the area		0.687				0.513
Q27 - Flood plains and slopes		0.871				0.779
Q27 - Presence of water bodies in the area		0.914				0.861
Q27 - Soil texture and quality		0.904				0.844
Q27 - Natural vegetation of the area		0.856				0.784
Q27 - Technology used in building	0.340			0.797		0.766
Q27 - Time available for management and maintenance				0.837		0.761

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations. b. Factor loading < .3 are suppressed.

Table 5.51 shows the descriptive statistics of factors influencing the sustainable management of human settlements.

It discloses that bulk of the respondents agreed on average that human capital factors ($\overline{x} = 4.422$; SD = 0.529), environmental factors ($\overline{x} = 3.630$; SD = 0.742), Socio-economic factors ($\overline{x} = 4.805$; SD = 0.524), Technological factors ($\overline{x} = 4.437$; SD = 0.528) and Legal factors ($\overline{x} = 3.6674$; SD = 0.636) influence the sustainable management of human settlements.

Table 5. 51 Descriptive analysis of the distribution of responses for sustainable management of human settlement

Factors	Nr. of items	N	Missing	Mean	Median	Std. Deviation	Range	Minimum	Maximum	Alpha
Human Capital	8	370	5	4.422	4.500	0.529	4.000	1.000	5.000	0.886
Environmental	5	363	12	3.630	3.800	0.742	4.000	1.000	5.000	0.910
Socio-economic	6	373	2	4.085	4.000	0.524	4.000	1.000	5.000	0.784
Technological	3	363	12	4.437	4.667	0.528	3.000	2.000	5.000	0.738
Legal	3	366	9	3.697	3.667	0.636	4.000	1.000	5.000	0.540

Source: Researcher's Analysis of Data (2019)

In addition, an independent-samples t-test was also conducted, to compare differences in the responses for each factor by examining the case studies, and the results are presented in Table 5.52.

It is interesting to note that of the five factors, there was no significant difference in the response trend of the case study participants.

There was no significant difference in the responses for human capital factors, Nigeria (M=4.441, SD=0.447) and South Africa (M = 4.374, SD = 0.701); t (133.397) = 0.899, p = 0.370.

This result suggests that the two case study participants responses indicates that they both rated that human capital has an influence on the sustainable management of human settlements.

The feedback for environmental factors however indicated there was a significant difference in response Nigeria (M=3.827, SD=0.541) and South Africa (M = 3.118, SD = 0.930); t (126.940) = 7.215, p = 0.0001, Cohen's d = 0.933 (large effect size).

The indication is that Nigeria participants evaluated this factor higher than the South African participants.

The response for socio-economic factors, as an influence on the sustainable management of human settlements also showed that there was no significant difference, with Nigeria (M=4.054, SD=0.481) and South Africa (M = 4.167, SD = 0.617); t (149.661) = -1.658, p = 0.099.

A reversal in the directionality of the effect is indicated by the negative t-value, and it has no bearing on the significance or otherwise of the difference between groups.

The difference in the responses from the two countries expressed by technological factors was not significant as table 5.45 reveals Nigeria (M=4.455, SD=0.482) and South Africa (M = 4.388, SD = 0.634); t (146.683) = 0.971, p = 0.333).

The indication of this is that the pattern of responses from the two participant case studies was not different as regards the influence of technological factors on the sustainable management of human settlements.

As Table 5.52 further shows, the two case studies have significant difference in their responses regarding the influence of legal factors in the sustainable management of human settlements, Nigeria (M=3.779, SD= 0.566) and South Africa (M = 3.484, SD = 0.751); t (147.333) = 3.596, p = 0.001, Cohen's d = 0.444 (small effect size).

The result indicates a significant difference in the pattern of responses regarding the influence of legal factors on sustainable management of human settlements.

Table 5. 52: Independent Samples T-Tests for Country Comparisons

Country		N	Mean	Std. Deviation	Std. Error Mean	F	p-value (variance)	t	df	p-value	Cohen's d
Human Capital	Nigeria	268	4.441	0.447	0.027	32.570	0.000	0.899	133.397	0.370	N/A
	South Africa	102	4.374	0.701	0.069						
Environmental	Nigeria	262	3.827	0.541	0.033	81.003	0.000	7.215	126.940	0.000	0.933
	South Africa	101	3.118	0.930	0.093						
Socio-economic	Nigeria	271	4.054	0.481	0.029	6.560	0.011	-1.658	149.661	0.099	N/A
	South Africa	102	4.167	0.617	0.061						
Technological	Nigeria	262	4.455	0.482	0.030	13.048	0.000	0.971	146.683	0.333	N/A
	South Africa	101	4.388	0.634	0.063						
Legal	Nigeria	264	3.779	0.566	0.035	9.575	0.002	3.596	147.333	0.000	0.444
	South Africa	102	3.484	0.751	0.074						

5.7 Awareness of an Existing Model, Template or Guideline that Incorporates Sustainability Features and Maintenance Practices for the Effective Management of Human Settlements

The investigation and the outcomes in this theme were to establish whether the respondents were aware of any known and/or existing model, template or guideline that is used currently in the management of human settlements and thus, can support its sustainability for the benefit of the stakeholders, as well as for the built environment.

The quantitative analysis and results as indicated in Table 5.53 and Figure 5.22 show that 5.9% (22 Nr) claimed that they were aware of an existing model, template or guideline, while 85.9% (322 Nr) affirmed that they were not aware nor had any knowledge of an existing model, template or guideline.

With only 7.2% (27 Nr) unsure and 1.1% (4 Nr) missing value, this result hence revealed that the knowledge / awareness of an existing model, template or guideline currently used in the management of human settlements was 85.9% negative while 5.9% was positive.

The positive 5.9%, mentioned neighbourhood watch, the infrastructure model presented by the Department of Treasury, BIM support and the housing code as models but that awareness of such documents does not assert the that there is a model nor do they have any other existing model for the management of human settlements.

This finding suggests that this position may be universal.

Table 5. 53 Awareness of existing model, template or guideline that incorporates sustainability features and maintenance practices for effective management of human settlements

Response	Frequency	Per cent
Yes	22	5.9
No	322	85.9
Unsure	27	7.2
Missing	4	1.1
Total	375	100.0

Source: Researcher's Field Survey (2019)

Awareness of existing model, template or guideline that incorporates sustainability features and maintenance practices for effective management of human settlements (375 Nr)

1
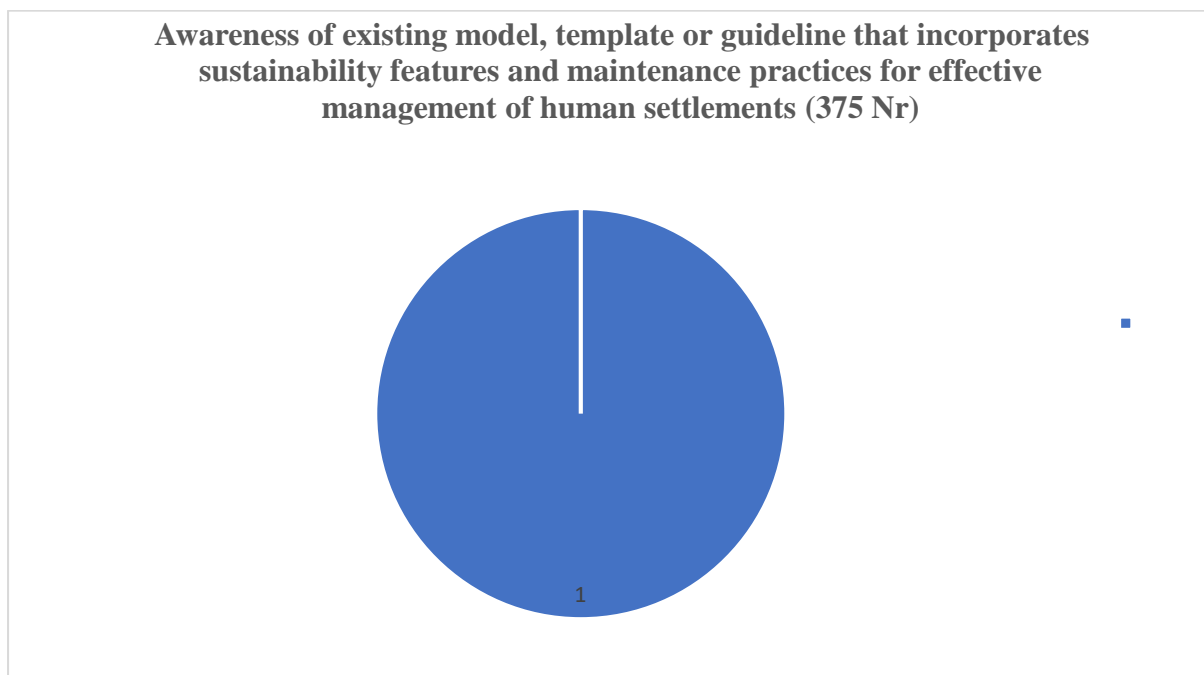
Figure 5.22: Awareness of existing model, template or guideline that incorporates sustainability features and maintenance practices for effective management of human settlements

Source: Researcher's Analysis of Data (2019)

5.8 Need for a Management Model for Human Settlement Sustainability

This theme seeks to evaluate the desirability of the proposed model for human settlement management, for working towards such sustainability to be of benefit to all stakeholders.

The questionnaire survey results in this theme as shown in Table 5.54 and the figures indicate that 88.8% (333 Nr) affirmed that there was a need for such a model, whereas 2.1% (8 Nr) contended there was no need for such a model and 8.0% (30 Nr) were unsure, while 1.1% (4 Nr) were missing. The results indicated that the need for development of a management model for human settlement sustainability cannot be overstressed as there was 88.8% in support as against 2.1% who expressed no need for it.

Table 5. 54: Need for a management model for human settlement sustainability

Response	Frequency	Per cent
Yes	333	88.8
No	8	2.1
Unsure	30	8.0
Missing	4	1.1
Total	**375**	**100.0**

Source: Researcher's Field Survey (2019)
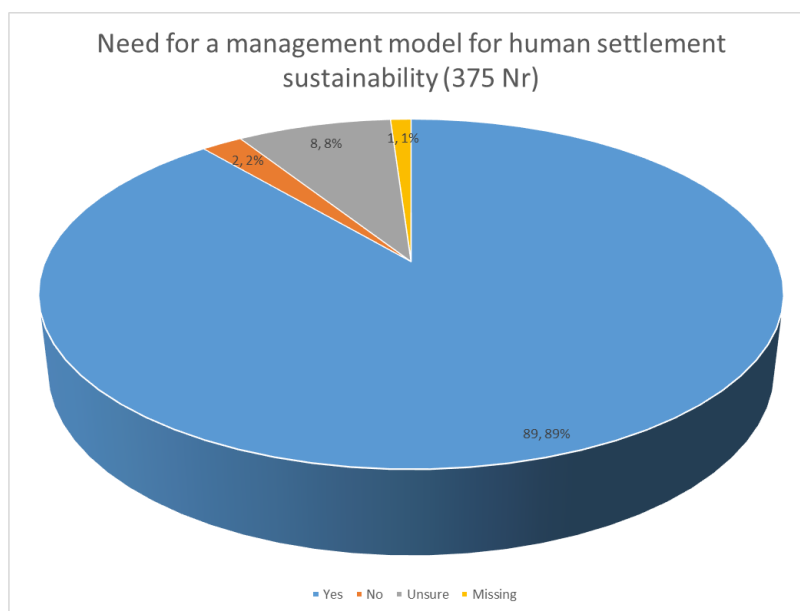
Figure 5. 23: Need for a management model for human settlement sustainability

Source: Researcher's Analysis of Data (2019)

The respondents further highlighted why the model was essential, and their responses are summarised below:

i. To ensure security, health and safety, thereby enhancing living conditions;

ii. To aid the maximisation of returns on investment and the longevity of human settlements;

iii. For sustainability in all facets;

iv. To reduce or eliminate avoidable costs and property loss;

v. To guarantee security, health and safety;

vi. To create employment in management and maintenance spheres;

vii. To shrink the housing gap and backlog;

viii. To hypothesize interrelationship between stakeholders;

ix. To warrant efficiency in our human settlements;

x. To preserve our heritage; and

xi. To aid planning implementation for sustainability.

The respondents also proposed some issues which the model must be cognisant of, which are: stakeholder participation, funding, research, monitoring, evaluation and feedback, simulation of human settlements with population growth, training and retraining of human settlement managers, policy formulation and review, the motivation of human settlement managers, an investment-friendly policy, a simple and concise policy, economic empowerment, education and sensitization, physiological and psychological issues and culture and tradition.

5.9 Summary of the Chapter

This chapter highlighted the various themes and presented the empirical data collected from the study along those lines. The data analysed was further subjected to various validity tests as appropriate. The next chapter presents the interpretation of the results discussed in Chapter 5 and it validates the results with theoretical underpinnings.

CHAPTER 6:THEORETICAL AND EMPIRICAL DISCUSSION

6.1 Introduction

This chapter relates each of the objectives outlined in Section 1.3 of this research to the outcomes of the analysed data. The problem that led to the investigation as stated in Section 1.1, is that current human settlement management practices are contributing to the visible persistent deterioration in human settlements in Nigeria and in South Africa. Besides, there is a shortage of research work substantiating the appreciable difference between the management systems of Nigeria and South Africa.

6.2 The Physical Condition of Human Settlements in Nigeria and in South Africa

The first step in addressing the research problem was to study the existing human settlements or neighbourhoods in Nigeria and in South Africa and provide an understanding of their setting. The criteria for identifying the condition of human settlements are the location, age, types and density of buildings and the current state and condition of human settlements (services, infrastructure and buildings) and a summary of this is presented in the following sections.

6.2.1 The location of human settlements of respondents

The findings of the survey, as indicated in Figures 5.9 and 5.10, as well as Tables 5.9 and 5.10, show that the participants who responded had a general spread from the case studies. In Nigeria, the responses came from the three geographic regions, being North, West and East as defined by the two major rivers, Benue and Niger. Also, responses came from five (5) out of the nine (9) provinces of South Africa. This result corroborates the definition of human settlements by the UN General Assembly/UN-Habitat I (1976:8) as places where people can live, learn and work within a mutual location which gives them something in common (Pland & Maré, 2005:8).

6.2.2 The age of human settlements of respondents

The empirical findings in Table 5.11 and Figure 5.11 suggest that the age of the human settlements managed by the respondents fall mostly between one to twenty (1 to 20) years, and that the minority were aged above twenty (20). In Nigeria, the ages could be an indication of the advent of the "Housing for all by the Year 2000AD" (Ebehikhalu & Dawam, 2015:43) and the decline could also be as a result of the recent economic recession. The era of economic

recession as indicated by Tenuche and Michael (2019:31) came simultaneously with weak government, weak treasury and weak income, which leads to unemployment, poor health care delivery, and inadequate social amenities that reduce the general well-being of citizens. Furthermore, the age range in South Africa also suggests that the human settlements were only established after the fall of the apartheid regime in 1994 and after the declaration of independence and the Housing White Paper (Cousins, *et al*., 2005:3; Mchunu & Nkambule, 2017:2).

The findings on age could be an indication of the current state of human settlements of the respondents, as indicated by Cheng *et al*., (2017:3) and Muldoon-Smith and Greenhalgh (2019:62) propose that age influences the state and the condition of the elements of human settlements. Tables 5.18 and 5.21 confirm that the age of a human settlement has a relationship with its physical state; as asserted by these authors. The indication of this is that the older the human settlements, the more obsolete its physical condition will be. However, the findings on the state of the services as indicated, does not agree with these assertions as the results do not show a relationship between the age of human settlements and the condition of services. A possible explanation for this result may be that services are sometimes replaced or maintained appropriately.

6.2.3 Types of building and density in the human settlements of respondents

The current study found that blocks of flats and detached houses are the most prevalent types of buildings in the case studies (see Table 5.12 and Figure 5.12). Cheng (2009:37-51) classified the types of buildings that could be found in each of the density categories. The low density classification comprises detached houses and terraced bungalows, medium density comprises blocks of flats (on not more than two floors) while high density comprises condominiums and high-rise block of flats. Mixed density is a combination of blocks of flats (not more than two floors), bungalows and detached houses. In Nigeria, most of the human settlements are categorised as low and medium density, and this could be as a result of the type of land and housing policy that the country operates.

Bartelt, Eyrich-Garg and Lockwood (2017:677) argued that as housing density increases, maintenance and sustainability issues increase, while Winston and Kennedy (2019:3) asserted that social perception is often linked to discussions of housing density and or intensification, and as such, it comes to bear on the management and on the maintenance of human settlements.

Hence, the study suggests that types of buildings and their density are an essential element in the management of human settlements.

6.2.4 Current physical state and condition of services within the human settlements of respondents

As mentioned in the literature review, the physical state and condition of human settlements are germane to its management and sustainability (Burger, 1994:41; Mani, Varghese & Ganesh, 2005:148; Van Wyk & Wessels, 2014:188). The results of this study indicated in Tables 5.17 and 5.20 that the current physical state and the condition of services of human settlements are acceptable for Nigeria and "Good" for South Africa. For emphasis, The State of Queensland Department of Housing and Public Works (2017) stated that an "acceptable condition" exists when there is evidence of substantial defects; dilapidated façades, a demand for maintenance; functional facilities requiring attention, due to delayed maintenance activity, and average physical appearance prevailing in the unit. "Good" is exemplified by inconsequential defects; insignificant wear and tear; worsening finishes; and vital maintenance activity not being required. It can, therefore, be implied, based on the findings of this study that the physical state and the condition of service within human settlements are a function of its management and hence its sustainability.

6.3 Human Settlements Maintenance Management

The second objective was to ascertain the principles and types of management used in human settlements in Nigeria and in South Africa i.e. whether they are owned privately, publicly or co-owned. The sub-sections discuss how this objective was addressed.

6.3.1 Estate Management approach used in human settlements

This research finding established, as seen in Table 5.26, that the respondents mostly use an outsourced Estate Management approach. Oladokun and Ojo, (2011:305) established that the expertise and the quality of choices made in the management of the human settlement by persons entrusted with the responsibilities are significant to the overall success of the settlements. Banfield (2014) further posited that the choice of management style is also dependent on the available resources. Hence, it could be inferred, that the outsourced approach is perceived by the respondents to be significant for the adequate management of human settlements in both Nigeria and in South Africa.

6.3.2 Ownership of human settlements

Despite the difference in the land and in the housing policies of the case studies, the results of the current study indicates (See Table 5.27) that government; whether at the local / municipal, state / provincial or federal / national is the major owner of human settlements. Kaganova and Nayyar-Stone (2015:320) posits that local governments are the largest property owners in urban areas and further, studies have noted the importance of government in the provision of housing (human settlements) (van Dijk *et al*. n.d.). However, the Nigerian Land policy, the Land Use Act (now Cap 202, LFN 1990), which vests all land rights in the governor of each state to hold such land in trust for the citizens may suggest the reason for this result. Surprisingly, the government in South Africa is indicated as being the major owner of human settlements, despite the fact that Cronje (2012) disclosed that they own only twenty-five percent (25%) of the total land mass. The indication of this is that the government is a major player in the provision and in the ownership of land and hence, the management of human settlements.

6.3.3 Maintenance types adopted and reason

On the question of what maintenance types are adopted and the reason for adopting such types, the present study, as shown in Figures 5.18, 5.19 and 5.20 and Table 5.20 indicated that mostly, reactive maintenance is employed for the maintenance of human settlements. Consistent with Barrie Chanter and Swallow (2007:197) who stated that there would be planned and unplanned work within any organisation and that the balance between them will vary, depending on the nature, attitude and the objective of the organisation to maintain the status quo. The reasons for adopting particular maintenance methods, as indicated in the results in Figures 5.19 and 5.20 range from cost-effectiveness, time, the availability of personnel, policy requirements, bureaucracy, funds and norms and all of these are in agreement with the factors identified by Akinsola (2012:13), who identified the factors influencing the maintenance programmes of buildings as personnel issues, physical issues, bureaucracy and economic / funding issues, among others. Akinsola indicated that the choice of reactive maintenance as the most used maintenance type is influenced by the above factors plus cost-effectiveness, time, policy requirements, and norms.

6.3.4 Maintenance condition

Another critical finding as revealed by Table 5.32 was that the majority of the respondents rated the maintenance condition of their human settlement as "fair", and that this agrees with the findings on the current physical state and condition of service, as shown in Section 6.14. This suggests that the respondents are aware that the management and the maintenance level of their human settlements is below average, and that could be an indication of the lack of a management model and maintenance policy, as observed by Adenuga, Olufowobi and Raheem (2010:103). This finding may help towards an understanding that a management model is the essence of achieving the goal and the objective of setting up human settlements and their sustainability.

6.3.5 Level of completion of human settlements

On the question of the level of completion of human settlements, the result, as shown in Table 5.35 indicates that most of the human settlements were completed and fully occupied. The indication of this is that the human settlements had been put into use and tended to depreciate, due to wear and tear, as reflected by Thomsen and Van Der Flier (2011:354).

6.4 Human Settlements Management Factors

The present study was designed to determine the influence of some factors on human settlement management. Eleven factors; political / policy, environmental, physical, organisational, socio-cultural, human resources, ethical / moral, socio-economic, legal, technological and macro-economic; were identified. These factors, both external and internal, have a significant influence on the role of the human settlement managers, and therefore, it is crucial for them to understand these factors and their impact on human settlement. This study found that these factors impose significant challenges for the maintenance and the management of human settlements. The following points describe some of the challenges that managers face, which impact the strategic management of such settlements.

6.4.1 Political / policy factors

The current study, as indicated in Table 5.41, reveals that political and policy factors had a mean score of 4.373. This suggests that the respondents rated the elements of policy and politics very high as a factor influencing the management of human settlements (Brandon *et al*., 2017b:378; Van Dijk, 2008:13; Mihyeon & Amekudzi, 2005:38; Mirela-Adriana, 2014:3462;

Roseland, 2000:73; Werkheiser & Piso, 2015). Chapter two argued that factors such as policy often challenge sustainability / sustainable development in human settlements. The elements of politics and policy include a lack of needs assessment, incoherent policies, non-implementation of policies, lack of policy coordination, deficiency in policy monitoring, the unavailability of policy review, the continuous political patronage and incessant political propaganda.

The Brundtland Commission underscored "needs", in their definition of sustainable development as: "the ability to make development sustainable - to ensure that it meets the **needs** of the present without compromising the ability of future generations to meet their own **needs**." (WCED, 1987). Furthermore, Hanis, Trigunarsyah and Susilawati (2010:6) acknowledged needs analysis as an essential element for achieving adequate management of human settlements for sustainability. Hence, the results from the current study agree with the literature on this point.

Buys and Nkados' (2006:997) position on the requirement for coherent policies for maintaining all amenities in the best possible manner supports the finding of this study which suggests that lack of coherence of policies is an influential factor in human settlement management.

The findings are also supported by Holden, Linnerud and Banister (2017:218); Holden (2013:89); Mathenge (2013:95); Turcotte and Geiser (2017:112) and Smeddle-Thompson (2012:118) who all posited that the formulation of policies should be dynamic and multi-dimensional and that there has to be proper structure to motivate policy implementation; adherence to policy; a proper regulatory and legislative framework and proper funding, all in the bid to achieve sustainability.

Furthermore, Kaganova and Nayyar-Stones' (2015:318-319) points towards decay in the elements of human settlements caused by a shortage of best practice, political interference, an insufficient legal and regulatory framework, a lack of commitment and the poor attitude of stakeholders, a lack of policy implementation, among others, which supports the finding of this study. The indication is that policy, and political factors have a strong influence on the management of human settlements.

6.4.2 Environmental factors

The current study, identifies environmental factors with a mean of 3.57, as shown in Table

5.41, as a factor that influences the management of human settlements. This finding aligns with Mani, Varghese and Ganesh (2005:148) who observed that the characteristics of the living environment, the physical features, the pattern of use and the social features determine human settlements' sustainability. Lützkendorf and Lorenz (2005:233), also concluded that environmental factors have an affiliation to the economic, social and environmental requirements for achieving sustainable development of human settlement management. The topography (elevation of site, vegetation and soil texture) and hydrological processes (natural drainage of basin of the area, the presence of flood plains and existence of water bodies) make up the character of the living environment, while the pattern of use includes how a community handles the use of water, sanitation and industrial activities, among others. The indication of this is that environmental factors cannot be isolated from the management of human settlements.

6.4.3 Physical factors

Physical factors, as identified by the current study (see Table 5.41), have a mean value of 4.23 and indicates them as a very strong factor influencing human settlement management. Devi, Lowry and Weber (2017:59) referred to all physical facilities and service institutions as including energy, housing, transport, employment, sanitation, communication, water, law and facilities of leisure, recreation, education, government, health and the arts and Akinsola (2012:13) identified physical issues as one of the factors influencing maintenance programmes of buildings. The findings of this research corroborate Akinsola's work.

Some of the physical factors as identified by this study, include bad house designs, a poor land use management model, the absence of public participation, the size of land and the expanse of a settlement, the location of the settlements and the ownership status of the settlement. This factor has an important implication for the development of human settlements, which in the long run, influences the management of human settlements.

6.4.4 Organisational factors

The efficiency of an organisational structure was recognised by David (2011:6) as germane to strategic management, and the result of this study highlighted that factor as influencing the management of human settlements. UN-Habitat (1976) also identified organisational elements as part of the sustaining factors for the totality of the human community. This study, as indicated in Table 5.41, reveals that organisational factors had a high mean score of 4.265,

which means that the respondents strongly agreed that organisational factors influences the management of human settlements. This finding shed light on organisational factors; such as the maintenance policy of the organisation, the procurement management method, the organisation itself, a lack of qualified personnel, adequate supervision of management and maintenance tasks, the training of management and the maintenance of personnel and the motivation of management personnel; as having an influence on the management of settlements.

This study agrees with Velmurugan and Dhingras' (2015:1630) observation that the development of a maintenance policy is vital to dealing with fundamental issues and to the anticipated benefits of stakeholders. It also brings to the fore RICS' (2012) position that a lack of a proper maintenance policy can lead to a lack of direction, negligence and misappropriation of resources, which could result in undue interruption of inhabitants' right of enjoyment; threats to health and safety; obsolescence (physical, economic and aesthetics among other things); and a decline in value. Furthermore, Ogunkah and Yang, (2013:42) argued that the acquisition of materials for a project should be feasible and viable economically, as this will have a long term effect on the management of the project. This suggests that the findings of this study show that the procurement management method of an organisation influences the management of their human settlements.

Additionally, Burger (1994:41) developed a model of housing development in a bid to measure its influence on beneficiaries, with a focus on the homeless. He acknowledged housing as a process and the importance of management as part of the process component, linking inputs and outputs in the housing (human settlement development) delivery process (See Figure 3.8). The comparison of the result of this study with those of other studies confirms that the organisational factor influences the management of human settlements.

6.4.5 Socio-cultural factors

The finding, as shown in Table 5.41, identified socio-cultural factors as influencing human settlement management, although they show a low mean value of 2.071. The World Health Organization (1999) identified social and cultural factors as one of the main elements / features of human settlements and they highlighted traditions, incorporating ethnicity, social values, religions, food and eating habits and power structures as the sub-factors. Ihuah and Kakulu (2014:56) also argued that the multi-dimensional and the changing traditions of people must

not be underrated in the management of human settlements as it will either make or mar the sustainability of the settlement. The results of this study indicate that ethnicity, norms and tradition and religious beliefs of inhabitants of human settlements have a low level of influence on the management of human settlements.

6.4.6 Human resource factors

Burgers' (1994) model included human resources as one of the essential components in a generic human settlement management model, and this is also recognised in the management principles listed by Koontz and Heinz, (2010). Furthermore, Kamarazaly, Mbachu and Phipps, (2013:136) identified the critical challenges currently facing management as including operational efficiency, statutory compliance and human resources, among other things. This study's finding in Table 5.41 agrees with the literature as it identifies human resource factors such as workplace hierarchy, job specialisation, division of labour in the workplace, standard operating procedure of the management of an organisation and weak governmental institutions as influencing human settlement management.

Velmurugan and Dhingras's (2015:1649) position that creating a division of labour for maintenance tasks to be performed and for coordination of results to achieve a common maintenance goal, is a must for maintenance managers, which supports the finding of this study that the division of labour within human settlement management organisations influences human settlement management. His further posits that the selection of the right maintenance personnel with appropriate capabilities, supported by continuous training and well-conceived incentive schemes are a must for an organisation to achieve performance effectiveness and efficiency, which concurs with the findings of this study. This finding implies that the nature of the workspace of human settlements managers and their work condition, is of the essence in the overall management of human settlements.

6.4.7 Ethical / moral factors

Gbadegesin and Ojo (2011:172), summarised the most common unethical business practices as outright bribery, unfair practices in pricing, price discrimination, dishonest advertising, price collusion by competitors, unfairness and prejudice in hiring, cheating of stakeholders, unfair credit practices, overselling, collusion by competitors and dishonesty in making and keeping to contracts. This study in Table 5.41 indicated ethical and moral factors as influencing human settlement management. The study identifies bribery, the embezzlement of funds

allocated for management and maintenance and the greed of personnel involved in management and maintenance as ethical and moral factors that influence the management of human settlements. It is, however, difficult to explain this result, but it might have to do with the issue of human resources and organisational factors.

6.4.8 Socio-economic factors

The findings of this study identified socio-economic factors as being very influential in the management of human settlements, as highlighted in Table 5.41, with an overall mean of 4.311. The literature indicates that at the centre of so many socio-economic activities, housing stands as an element of urban development, social acceptance and a measure of growth and of prosperity (UN-Habitat, 2013). Some of the socio-economic factors identified by this study include the conflict of interest of stakeholders, lack of funds for maintenance and management activities, fiscal policies of the government, poor education and a low literacy level of inhabitants, population density of the human settlements and disputes by inhabitants. All of these tend towards issues of public participation in the management of human settlements, as Doku (2013:40) observed that non-participation might become a basis for rejection or non-appreciation by the human settlement community. Hence, this indicates that the socio-economic factor is vital to the management of human settlements.

6.4.9 Legal factors

Legal factors, as indicated in Table 5.41, have the highest mean value (4.427) of all the factors identified in this study. Legal factors indicated by this study include breach of covenants / contract by inhabitants, a default in payment of rents, rates and taxes and a lack of maintenance records.

Olajide (2017:12) identified the features of the human settlement, which he posited defines its management challenge, and he argued that the legal character determines the degree and the quality of control. He stated that the basis of management would depend on the form of rights, privileges, and obligations that subsist in human settlements. Besides, "legal characteristics" is one of the factors identified by several authors as essential to the failure or to the success of human settlement management (DeLisle & Grissom 2017:293; Emerole, 2018:5; Glumac & Des Rosiers, 2018:75). Similarly, one of the factors proposed as leading to the decay of human settlements by Kaganova and Nayyar-Stone (2015:318-319), is an insufficient legal and regulatory framework. Hence, this indicates that the success and the sustainability of human

settlement benefits will always be dependent on legal factors, among others.

6.4.10 Technological factors

Kamarazaly, Mbachu and Phipps (2013:136) identified one of the critical challenges currently facing management as keeping up with rapid changes in technology. Harvey and Reed, (2007:372) and Mutale (2017:x–xi) also reasoned that the selection of appropriate technology is dynamic for any development. These works of literature give credence to the findings of this study (see Table 5.41) that technological factors with a mean value of 4.031 influenced the management of human settlements. The factors as identified, are the availability of spare parts for infrastructure and equipment, software tools for maintenance activities which indicates that technology is vital in the management of human settlements.

6.5 Human Settlement Sustainability Issues

The current study also sought to establish awareness and understanding of the respondents about sustainability / sustainable development and the critical sustainability factors for human settlement management. The results are discussed below.

6.5.1 Awareness and understanding of sustainability in human settlements management practice

The findings of this study as indicated in Tables 5.43 and 5.44 reveal that a major percentage of the respondents revealed that they are aware of and that they understand the sustainability concepts and issues in human settlement management. Table 5.45 also confirms that a significant percentage of them has awareness and an understanding rated as above 'good'. The indication is that the respondents have sufficient knowledge to help them execute sustainable management of human settlements

6.5.2 Significance of the concept of sustainability to the management of human settlements

This study, as indicated in Table 5.46, shows that sustainability is significant to the management of human settlements with most of the respondents acceding to this view. The indication of this is that sustainability cannot just be wished away.

6.5.3 Factors to the sustainable management of human settlements

Five factors, namely human capital; environmental, socio-economic, technological and legal, were established. These factors have been identified as having a significant influence on human settlements, and hence, they are vital for the management of human settlements towards the Sustainable Development Goal 11 of making cities and human settlements inclusive, safe, resilient and sustainable.

Documented evidence on this theme also confirms that the sustainable development and management of human settlements in the research specific context cannot be achieved without proper recognition and an interlocking of these essential factors / issues (Perry-Jones, 2001; FMLHUD, 2012; UNSD, 1992).

Literature from Brandon *et al*. (2017:378), Van Dijk (2008:13), Mihyeon and Amekudzi, (2005:38) Mirela-Adriana (2014:3462), Roseland (2000:73) and Werkheiser and Piso, (2015) indicates that factors such as policy often challenges the three pillars that support sustainable development in human settlements, namely: (society, economy, and the environment);institutional; socio-cultural; environmental; technological; fiscal; and monitoring, assessment and documentation. This study has established that these three pillars have a significant influence on the maintenance management of human settlements, and they are discussed below.

6.5.3.1   Human capital factors

The current study, as shown in Table 5.51, indicates that human capital factors have a mean value of 4.422. The elements identified as human capital factors are the education level of inhabitants, the education level of management personnel, the technology used in management exercise, professional expertise involved in exercising management, the population density of the settlements, a policy framework for management and maintenance, community participation and technology used in building. This factor is contrary to the factors identified by Burges and van Wyk, as none of them identified human capital as a factor. It is however, interesting to note that the sub-factors identified by the current study agree, with some factors having been already identified in the literature.

El-Gohary *et al*. (2006:601) and Mok, Shen and Yang (2014:453) identified a lack of education, monitoring, information and communication (community participation); deficient capacity

building; and documentation strategy, as factors that are damaging towards human settlement sustainability. The findings of this study indicate that holistic human capital is vital to the sustainable management of human settlements, and that human capital is about the human settlements' manager and the inhabitants.

6.5.3.2   Environmental factors

Ihuah and Eaton (2014) identified that environmental factors which include quality and condition of the human settlement space; the housing design vis-à-vis aeration, illumination, and the building elements; energy consumption issues and carbon emission; the natural landscape; and the complementarity of the human settlement with the natural land for preservation, are essential to the sustainability of human settlements. This study as illustrated in Table 5.51 shows that environmental factors have a mean value of 3.630. They comprise the following sub-factors: elevation / the topography of the area, flood plains and slopes, the presence of water bodies in the area, soil texture and quality and the natural vegetation of the area. Mani, Varghese and Ganesh (2005:148) observed that all these features determine human settlements' sustainability. This finding suggests that in the management of human settlements for sustainability, there must be consideration given to these environmental factors.

6.5.3.3   Socio-economic factors

With a mean value of 4.085, as shown in Table 5.51, this study suggests that the socio-economic factor is imminent for sustainable management of human settlements. UN-Habitat (2013) posits housing stands as being at the centre of so many socio-economic activities, and they are a sign of social acceptance and a growth mark of prosperity. The socio-economic sub-factors identified by this study are inhabitants' income, the scale of unemployment, the social status of the inhabitants, the occupation of the inhabitants, the safety of life and property and the social justice system of the community. All of these sub-factors are elements of two of the three elements of sustainability, that is social and economic sustainability. The finding of this study is in accord with the literature on sustainability and its relevance to the management of human settlements.

6.5.3.4   Technological factors

Technological factors as dynamics for sustainable human settlement management has a mean value of 4.437, as highlighted in Table 5.51. As mentioned in the literature review, exposure

to technology stimulates obsolescence (Thomsen & Van Der Flier, 2011:35) and for human settlements, endless enhanced technology and enrichment in growing prosperity benchmarks induces limitations for the management of human settlements. Mali-Swelindawo (2016:374) also identified that technology has its pros and cons; hence, it creates problems and simultaneously makes life better. The technological factors that this study identified are available landmass, the technology used in building and the time available for management and maintenance, and the fact that technology must be in harmony with literature. The indication of this is that technology has a strong influence on the sustainable management of human settlements.

6.5.3.5 Legal factors

The finding as shown in Table 5.51 identified legal factors as having an influence on human settlement management, with a mean value of 3.697, and it involves the tenure of the inhabitants, title deeds / documentation and security of tenure as sub-factors. DeLisle and Grissom (2017:293) identified the legal factor as one of the essential factors contributing towards the failure or success of human settlement management. An indication of this is that the influence of legal factors on human settlement management is strong.

6.5.4 Awareness of existing model, template or guideline that incorporates sustainability features and maintenance practices for effective management of human settlements

The findings in this study as highlighted in Figure 5.22 and Table 5.53 revealed that eighty-six percent (86%) of respondents disclosed that they are not aware of any existing model, template or guideline that incorporates maintenance practices for effective management of human settlements. Although the literature identified some models, Kolk and Peregos' (2010:193) affirmation that the decision to adopt a sustainability assurance service is dependent on the level of awareness about sustainability that agrees with the findings of this study. The indication of this is that there is a need for awareness of existing models.

6.5.5 A need for a management model for human settlements' sustainability

The current study found that eighty-nine percent (89%) of the respondents affirmed that there is a need for a management model for human settlements' sustainability, as indicated in Table 5.54. The finding is in agreement with Lützkendorf and Lorenz (2005:233) and Cooper and Jones (2008:366) who emphasised issues of sustainability in housing / human settlement management.

6.6 Developing a Model for the Management of Human Settlements (Research Objective Five)

This section presents the proposed model for the management of human settlements, which addresses the fifth objective of the research. It further provides an explanation of the model development process and the approach of using the model in practice. Therefore, the sub-objective of this section is to propose a model, using the findings from Chapter 5 of this research work. The management of human settlements plays a vital role in meeting the goals of obtaining continuous benefits or returns. Essentially, putting up the structures alone does not bring about the desired change in human settlements, without the establishment and upholding of sound management principle and practices (United Nations, 1969:vii). However, research findings reveal that the current management models are unknown to human settlement managers and other stakeholders and could hence be the pointer to the current state of human settlements. Subsequently to the surveys and the interpretations of the empirical results, some critical areas for improvement in human settlement management were identified, and a strategy for appropriate corrective action was thus proposed through a model. The development of a model is a process where the researcher articulates and conceptualises based on data retrieved from works of literature, and subsequently moves to empirical data which becomes the foundation for the conception of the proposed model (Jabareen, 2009). This suggests that such data gathered from various sources enables the researcher to derive qualitative and quantitative underpinnings for dealing with the various holistic challenges and realities. Therefore, this factor was considered vital in the realisation of the development of a model for the management of human settlements.

Another critical factor which was considered was the universality and the simplicity of the model. A good model enables all stakeholders to understand better, to identify, to assess, to integrate, to implement and to monitor vital issues (Perry-Jones *et al*., 2001). The model arising from this study is premised on the awareness, the understanding and the identification of Estate Management methods, maintenance approaches and sustainability factors for human settlement management. The proposed model was, however, preceded by a review of relevant literature on the subject matter and contextualised into human settlements management, as presented in Figure 3.10.
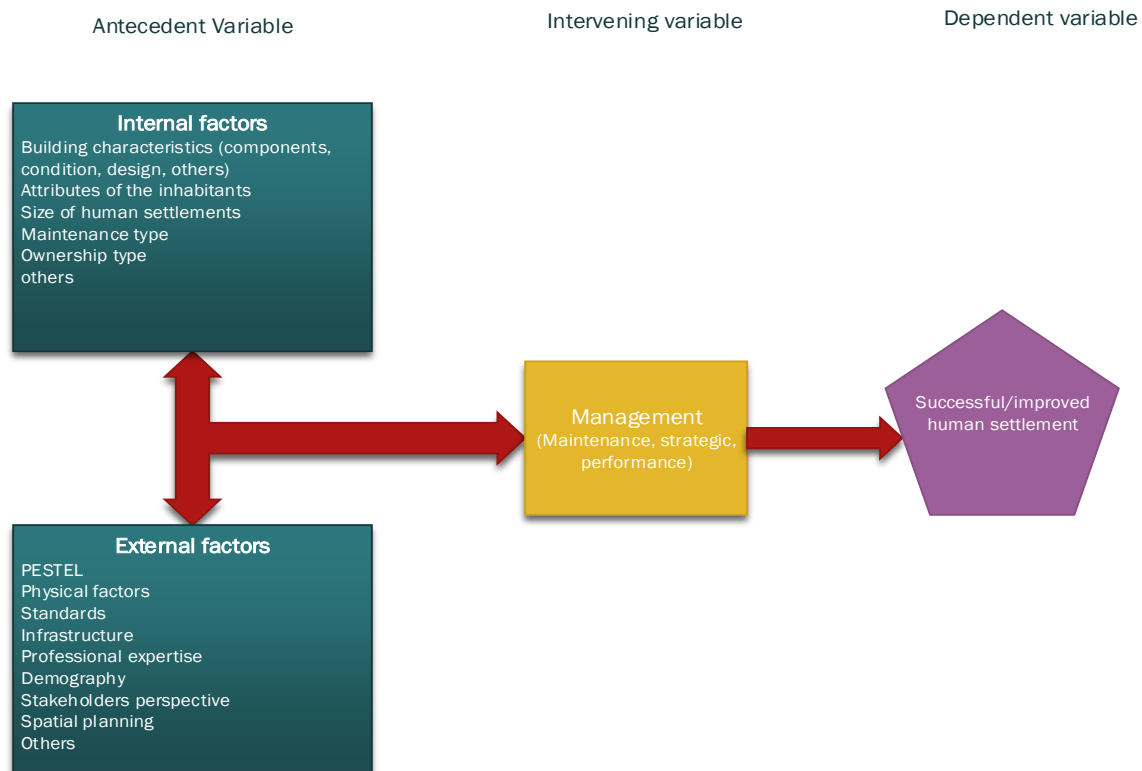
Figure 3.10: Conceptual construct for successful / improved human settlement management
(Author's Construct)

The initial conception of the researcher identified that the successful management of human settlements might not be achieved with a single set of factors but rather by observing the interaction of several factors. This implied that, in order to manage human settlements, sustainably, internal and external factors impacting the fabric of the human settlement needed to be examined. Hence these factors were identified, evaluated and applied or integrated as appropriate, into human settlements for their sustainable management in the case studies and elsewhere. Despite these, the appropriate consolidation of the various components was the initial foundation for the review of literature, empirical data, its analysis and subsequent findings. This process was used in the development of the model, and the whole research work stemmed out of and was sustained by this. The conceptual construct in Chapter 3 for the management of human settlements, which evolved and emerged from the qualitative and the quantitative findings, into the model as shown in Figure 6.1, that it not only responds to the research objectives and research questions, but it also reveals that critical intervention and improvement was essential.

The findings emanating from the research analysis and supported by the literature exposes the danger of the non-management of human settlements, and this is vital to prevent decay and the

loss of sustainability and optimisation of their benefits within the built environment. The synergy of the various drivers of human settlements by the relevant stakeholders is crucial to its management. Despite the use of "an appropriate human settlements maintenance and management system," the current conditions prevailing in human settlements are poor as a result of a lack of appropriate maintenance management approach, a lack of an appropriate Estate Management approach, a lack of or ineffective involvement of, the relevant stakeholders and a lack of integration of the essential and beneficial sustainability factors; into the human settlements in Nigeria and in South Africa; which has made it necessary to perform this study.

The development of the model was guided by the data collection and the analysis of the results that emanated therefrom. Hence the model relates to the management of human settlements and it focuses on enhancing the sustainability of human settlements in Nigeria and in South Africa as well as in other developing countries. The model developed for the management of human settlements indicates that the management of human settlements might not be accomplished sustainably with a limited set of factors but by incorporating other significant and vital sets of factors each collaborating together, would enable the development of a model for human settlement management. This suggests that in a bid to manage human settlements in a sustainable manner, the various factors: ownership, human resource and capital, social, legal, technology, economic, physical and environmental were all vital and very significant. Therefore, these factors need to be identified, understood, assessed, implemented appropriately and subsequently integrated into human settlements for their sustainable management in Nigeria and in South Africa.
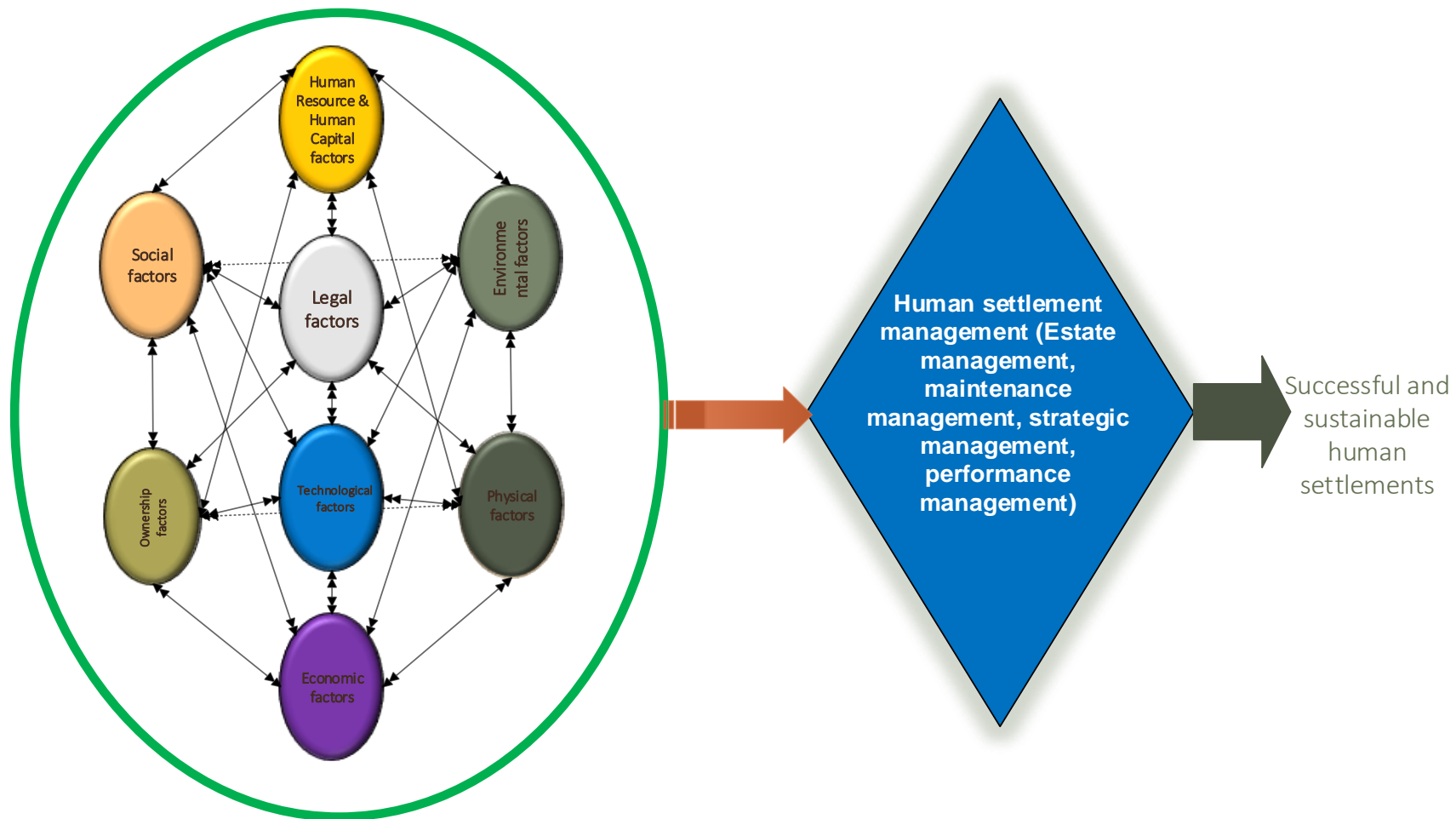
Figure 6. 1: Model for sustainable management of human settlements

The summary of the salient features of the thematic areas reinforcing the model developed for the management of human settlements is presented in the following subsections.

6.6.1 Human resource and human capital factors

Pertaining to the human resource and human capital factors for the management of human settlements, as shown in Figure 6.1, key items to be noted are:

i.   Maintenance policy of the organisation

The organisations' maintenance policy will determine the type of maintenance required to meet the set goals of the organisation involved in human settlements management and it will subsequently determine the success or otherwise of human settlement sustainability; hence the formulation of an appropriate maintenance policy, which will be effective and efficient is germane.

ii.   The procurement management methods of the organisation

The right procurement method for spare parts and other services for maintenance activities must have a cycle that is devoid of bureaucracy and time delays, so that an effective critical success factor can be guaranteed.

iii.   Lack of qualified personnel

Staffing is identified as one of the core functions of a manager and hence, it is important that qualified personnel must be appointed for the management of human settlements to ensure their success.

iv.   Adequate supervision of management and maintenance tasks

For proper monitoring and evaluation, adequate supervision must be embarked upon by the appropriate superior, to ensure that management and maintenance activities are carried out, in line with the set goals and the objectives of the maintenance organisation, aimed towards the success of the human settlements.

v.   Training of management / maintenance personnel

As a result of the dynamics of human settlements and its inhabitants, management and maintenance personnel must continuously undergo training and retraining programmes to update them as to the current ways of achieving sustainable, successful human settlements.

vi.   The motivation of management personnel

Personnel motivation is a key factor in encouraging employees to increase performance hence appropriate strategy must be employed to enhance personnel's performance while bearing in mind that a given strategy may have varying motivational effects on different people.

vii.   Work-place hierarchy

The organogram of the management organisation must be such that the line of authority is not just top-bottom but also bottom-top, to guarantee that all staff have a sense of belonging and commitment to the ideals of the organisation. Moreover, the work hierarchy must ensure that each member of his or her group knows his place and his function towards biological mechanisms for sustaining pace and cohesion within such groups.

viii.   Job specialisation

Job specialisation is indicated to influence ethical behaviour, and therefore professionalisation and specialisation of human settlements managers would enhance the required ethical behaviour that will stimulate efficiency in the workspace.

ix.   Division of labour

Division of labour gives detailed tasks to a specific employee who can enjoy job satisfaction and who can find ways of improving his or her work so that he or she will have a sense of belonging and responsibility towards division as part of a whole, all working towards the same goal of efficient human settlements management.

x.   Standard operating procedures of management organisations

Organisations have various challenges and it may be difficult to maintain rigid standards, but they must be able to manage change and incorporate the theory of change in their management policies, to meet dynamic changes in human settlements.

xi.   Weak government institutions

Government institutions statutorily involved in human settlements management must be empowered to carry out their oversight functions, to ensure that managers are performing their duties as required. This may involve the review of policies and programmes, to strengthen such institutions.

xii.   The education level of inhabitants

The level of education of the inhabitant can be a determining factor in management activities. The more educated the inhabitants are, the higher their level of understanding of the need for maintenance and their ability to read manuals of facilities and services will be. This could go a long way towards reducing unnecessary damage and wear and tear which could otherwise be occasioned by mishandling of the fabric of human settlements.

xiii.   Education level, professional expertise of management personnel and technology used in management

The quality of decision making depends largely on the management personnel. An expert, by virtue of his educational training and expertise should be using a highly developed model, using appropriate technology towards decision making in the daily workings of human settlements and this will determine the quality or otherwise of the human settlement management activities and hence its sustainability.

xiv.   Population density of the settlement

The population density of a human settlement, if high, would require more facilities and more effective management activities because of the resultant effect of the facility having to handle a greater density of people. It may require less activity as the intensity of usage increases, that is the facility to person ratio will be lower. Hence this needs to be taken into consideration.

xv.   Policy framework for management / maintenance

For a human settlement to achieve its desired objective, a management and maintenance policy is required to support such objectives. This policy would serve as a blueprint or as a roadmap for the human settlements' manager to enhance the focus on achieving the goal of sustainability.

xvi. Community participation

To stimulate a sense of ownership, one of the main requirements is community participation. This requirement will motivate the commitment of inhabitants toward increased maintenance and care of human settlements and the work of the human settlements' manager will be made easier with continuous feedback and a greater sense of responsibility of inhabitants.

xvii. The technology used in building

The technology used in the building of the human settlements, be it conventional or alternative building technology, will determine what technology must be used in the management of the human settlement. More complex technology will require more complex management technique and expertise and vice versa.

6.6.2 Social factors

Vital social factors to be taking cognizance of for the management of human settlements, as presented in Figure 6.1 are:

Socio-cultural factors

The diverse ethnicity, norms and tradition, as well as the religious belief of inhabitants, will manifest themselves in their conduct and in the way that they use facilities and services which may, as a result, cause damage to them. Therefore, the human settlement manager should consider these factors in the choice of the right management approach to employ.

Ethical / Moral factors

Professionalisation and continuous evaluation and monitoring of the activities of personnel involved in the management of human settlements would reduce if not fully eliminate the vices of bribery, embezzlement of funds allocated for management / maintenance and the greed of personnel involved in management and maintenance

6.6.3 Ownership factors

The major point to be noted regarding the sustainable management of human settlements, as presented in Figure 6.1 is:

Ownership status of the house / land

Ownership is a unit of control defining the degree or the nature of interest held in the human settlement such as a freehold contract (landlord) or a leasehold contract (tenant). The nature of the ownership held will enhance or undermine the level of resource obligation towards the management and the maintenance of human settlements, and the risk level that needs to be accommodated. Hence the human settlement manager must take cognisance of this factor.

6.6.4 Economic factors

One of the supports of sustainability, which is an economic factor, is also identified as illustrated in Figure 6.1, and the subfactors which relate to it are:

Socio-economic factors

i. Conflict of interest of stakeholders, Disputes between inhabitants

For every dispute that occurs in human settlements, key areas for action must be identified, with specific actions for different stakeholders, and this will enable a level playing field for all stakeholders. Potential future conflicts of interest need to be addressed through well thought out strategies and integration of traditional conflict prevention mechanisms. Careful and well-informed planning may help to reduce the likelihood of conflicts arising in new settlements.

ii. The lack of funds for management / maintenance activities

Maintenance and management elements require funds and man-hours to participate independently in improving performance within human settlements and the achievement of sustainability. There is a need for adequate allocation of funds for such activities to be able to achieve sustainability.

iii. Fiscal policy of the government

The challenge of management may not be lack of funds alone, but it may also include inadequate allocation of funds, as a result of the general lack of appreciation of the need for maintenance and the low priority accorded to it. The fiscal policy of government must give the necessary importance to maintenance and management of the infrastructure and services of human settlements.

iv. Poor education and literacy level of inhabitants

Skills of reading and writing enables fuller participation both socially and economically and further stimulates a higher degree of control over everyday activities. Hence, the human settlements manager must understand the literacy and the education level of the inhabitants and be able to relate with them, at their level of understanding. Moreover, there may be the need for a literacy engagement, to ease the execution of his managerial duties.

v. Population density of the settlement / housing estate

The provision of adequate technical infrastructure such as street networks, telecommunications, water supply, sewer system and electricity, is essential for sustainable human settlements as the intensity of use will determine the amount of wear and tear. As such, the human settlements manager must be aware of the density level within the human settlements and must make provision for future growth.

vi. Inhabitants income, scale of unemployment, occupation and social status

These factors have an overarching effect on the management of the units of occupation and the integrated human settlements. With low purchasing power, coupled with a low employment level and low status type of occupation which determines the occupant's societal status, the human settlements manager must make provisions bearing in mind the status of the people and that provision must be made for this, and management must tailor appropriate policy.

vii. Safety of life and property

Safety is a factor that is usually associated with user comfort and is an important factor that must be considered in managing human settlements, because any breach of the user's safety may result in injury or damage. Hence, the human settlements manager must build safety precautions into the preparation and execution of management activities, to ensure sustainability in all its ramifications.

viii. The social justice system of the community

The human settlements manager must participate in the planning and the execution of managerial activities and pay vital attention to multiple, diverse framings and narratives and provide vital opportunities to advance debates about management style and connect them with

questions of social justice. This is to ensure that the issue of social justice is adequately taken care of in daily management activities, as it is an important element of sustainability.

6.6.5 Physical factors

The basic physical factors to be considered for human settlement management are:

1) House design

Design is a complex skill which requires a thorough thought process and integration of many and varied considerations. Furthermore, design is concerned not only with building or housing morphology, but also with specifications and construction methods. Hence, the more complex a design is, the greater is the additional management acumen that is required. Therefore, the human settlements manager should be flexible in the adjudication of the management responsibility towards sustainability.

2) Absence of public participation

Participation by the public and the inhabitants will help to mitigate the internal conflict as well as act as a bridge between the rising expectations of the inhabitants and the expensive practice of human settlement management. The human settlement manager must put in place a mechanism where there will be absolute participation of all stakeholders in the achievement of sustainable human settlements.

3) Size of land / expanse, and location of human settlement

Individual human settlements are unique in many ways and as such, the required management style differs for each human settlement. The size of a human settlement and the location in which the human settlement management organization operates influences the perceptions of the human settlement manager regarding the problems faced and hence, the nature of the management task. Therefore, this factor must be considered for sustainability of human settlements to ensure appropriate management practice.

4) Land use management model

Land-use management is a dynamic multi-factor and cross-disciplinary process that requires several methods for successful results. Land-use is affected by many factors, such as population, economic structure, policy and ecological conservation goals. Hence, the human

settlement manager has to employ system analysis and dynamic modelling of land-use change as an essential tool for human settlement management.

6.6.6 Environmental factors

The basic environmental factors to be considered for human settlements management, as illustrated in Figure 6.1 are the natural drainage basin of the area, the existence of water bodies, the elevation / topography of the area, flood plains and slopes, soil texture and quality and the natural vegetation in the area. The sustainability of human settlements will be influenced by these environmental factors as they will define the design in terms of lighting, and building morphology; energy consumption issues; ventilation; building design; the natural topography of the land; and how the human settlement consolidates with its natural environs for enhancement and preservation.

6.6.7 Legal factors

As regards legal factors for the management of human settlements as shown in Figure 6.1, key conditions to be observed are covenants / contracts undertaken by inhabitants, the payment of rents / rates / taxes, maintenance records, tenure of the inhabitants, title deeds / documentation and security of tenure. Sustainability aims to ensure that every development has the potential to continuously demonstrate that it is safe; cheap; comfortable; accessible and provides secure tenure for the people. Therefore, for effective management of human settlements, there must be a demonstration that the legal factors align with its sustainability and this must reflect in the dealings of the human settlement's manager.

6.6.8 Technological factors

The vital items of technology to be aware of for the management of human settlements; as presented in Figure 6.1 are spare parts for infrastructure and equipment; software tools for maintenance activities; the available landmass; the technology used in building; and the time available for management and maintenance.

The human settlement manager must ensure that the necessary technology and resources must be available, and that the appropriate stakeholders must be capable of utilising the technology and resources to achieve successful management of the human settlement. Furthermore, the human settlements manager must ensure that there is a technology transfer and that the technology is acceptable to the inhabitants.

The model in Figure 6.1 evolved from the outcomes of the five (5) objectives of the study, and it shows an interrelationship between all the factors. However, the need for awareness of a human settlement management model is vital, and the combination of all the factors will enable the sustainability and the achievement of the set goals of human settlements in Nigeria and in South Africa, as well as in other developing countries.

6.7 Summary of the Chapter

This chapter has discussed the findings of the research with respect to the objectives of the study. Presented in the next chapter are the summary, conclusions, recommendations and contributions to the body of knowledge.

CHAPTER 7: THE SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND CONTRIBUTIONS

7.1 Introduction

This research achieved its primary objective of developing a model for the management of human settlements, and this chapter presents a general summary of the research aims and objectives, the research question and it further presents the conclusions drawn and the general recommendations made towards the management of human settlements. An outline of the contribution to the body of knowledge achieved by this research and suggested areas for further research is provided towards the conclusion of the chapter.

7.2 Restating the Research Aim, Objectives and Research Questions

For purposes of clarity, the summaries of key findings relating to this research are linked with the research objectives and the research questions that were initially set out to guide the research process. The aim of the study was to examine human settlement conditions, to identify human settlement management methods and issues that would enhance achieving SDG 11, in order to develop a management model for human settlements in Africa for practice.

The objectives that the study addressed towards achieving the aim were as follows:

- Studying existing human settlements in Nigeria and in South Africa;
- Ascertaining the principles and the types of management and maintenance used in human settlements in Nigeria and in South Africa;
- Assessing the various factors that affect human settlement management in Nigeria and in South Africa;
- Determining and evaluating factors that are beneficial to the sustainable management of human settlements in Nigeria and in South Africa; and
- Establishing a feasible and workable sustainable human settlement management model that would enhance better living conditions and environmental quality, in the study areas.

The following research questions were presented to meet the objectives,

    i.   How are the states of integrated human settlements in Nigeria and in South Africa, and why?

ii. What are the management and maintenance principles currently used in the human settlement, why and by whom?

iii. What are the various factors that influence human settlement management?

iv. Are there critical sustainability factors required for the sustainable management of human settlements, and how are the factors ranked?

v. Would the integration of sustainability elements and an appropriate Estate Management method affect the management of integrated human settlements in Nigeria and in South Africa?

As stated earlier, the aim of this research was to develop a model for the management of human settlements. In pursuing this aim, five (5 objectives were established. The achievement of each of the five research objectives is discussed in the following subsections.

7.2.1 To Study existing human settlements in Nigeria and in South Africa

This objective required an examination of the existing human settlements in the two case studies of Nigeria and South Africa. This objective was achieved by obtaining and analysing information from the case studies, using a quantitative method of data collection. Analysis of the data showed that human settlements were spread all over the cases and that their ages were mostly between one and ten (1 and 10) years, followed by eleven to twenty (11 to 2)0 years and twenty-one to thirty (21 to 30) years. Blocks of flats are also the predominant types of buildings, closely followed by detached houses and terraced bungalows. Condominiums occurred minimally. Furthermore, the analysis showed that medium density human settlements were predominant followed by low density, mixed density and high density. In addition, the state of the physical conditions of the two case studies was assessed to be "good" while the services of human settlements in Nigeria were adjudged to be acceptable, as against the South African counterpart that was indicated as good. These analyses were provided from Tables 5.9 to 5.24 and Figures 5.9 to 5.15. Investigations showed that the existing human settlements in the case studies were in an acceptable state and that this condition was a function of age, density, types of buildings, state of services (infrastructure) and building components.

7.2.2 Ascertain the principles and the types of management and maintenance used in human settlements in Nigeria and in South Africa

The objective sought to identify and to ascertain the principles and the types of Estate Management methods used in human settlements in the case studies, and in the research

question which was: "What are the management and the maintenance principles currently used in human settlements, why and by whom?" The literature was consulted to identify the principles and the methods of Estate Management applicable for human settlement management, the outsourced method was mostly adopted while the partnership / hybrid of in-house and outsourced, was the second most used. The in-house approach was third, while a few did not know the method that had been used. Government at all levels is the primary owner of human settlements while some others were privately or and jointly owned under public-private partnerships and the maintenance adopted by them was mostly reactive maintenance which hence, shows the reason why the current state of human settlements is adjudged as fair. Planned corrective and planned preventive maintenance methods are ranked second and third in the method used while unplanned maintenance was the least. The reasons for adopting the maintenance type of usage comprised cost-effectiveness, insufficient time available, suitability, the availability of personnel, a policy requirement, funding and norms of practice, among others. In addition, most of the human settlements of the respondents are completed and occupied. These analyses are presented in Tables 5.25 to 5.30 and in Figures 5.16 to 5.21.

7.2.3 Assess the various factors that affect human settlement management in Nigeria and in South Africa

The third objective sought to assess the factors that affected human settlement management and the research question to achieve this objective posed the question, asking what the various factors that influenced human settlement management are. The various factors identified from the literature were listed, and the responses regarding their influences were ranked. A lack of maintenance records ranked the first among the factors, followed by a deficiency in policy monitoring. Ranking third was the issue of the training of management and maintenance personnel, while the fiscal policy of government and non-implementation of policies ranked fourth and fifth, respectively. At the bottom of the table was the elevation of the site, the norms and the traditions of inhabitants, the ethnicity of inhabitants and the religious beliefs of the inhabitants which ranked below average (see Table 5.33).

7.2.4 Determine and evaluate factors that are beneficial to the sustainable management of human settlements in Nigeria and in South Africa

The fourth objective was to determine and to evaluate the factors that are beneficial to the sustainable management of human settlements in Nigeria and in South Africa, with a

correlating research question being: "Are there critical sustainability factors that are required for the sustainable management of human settlements, and how are the factors ranked?". Empirical data which was analysed and presented in Table 5.43 identified inhabitants' income, the time available for management and maintenance, the technology used in building, the professional expertise involved in the management exercise and the technology used in management as the first five (5) factors. The last five (5) factors mentioned were: soil texture and quality, the tenure of the inhabitants, the age level of the inhabitants, the elevation / topography of the area and the title deed / documentation.

7.2.5 Establish a feasible and workable sustainable human settlement management model that would enhance better living conditions and environmental quality in the study areas

The fifth and last objective of the research was achieved by developing a graphical model that could enable sustainable management of both present and future human settlements. The model provides a strategic context which indicates the essential factors that are vital for the achievement of overall human settlement goals. Significant improvements in human settlements can emerge through the application of the model, in the human settlements management system. It provides decision-makers with information relating to a series of key performance indicators or criteria. The management vision, organisational processes, the user, the employee / expertise, the feedback and the critical performance aspects or objectives identified in the literature and quantitative analysis are incorporated into the model. From the results of the analyses carried out, it can be concluded that the objectives of the study have been achieved.

7.3 Conclusion

The aim of the research study was to establish an understanding of human settlements management, as practised in Nigeria and in South Africa and to identify potential areas for improvement, by incorporating sustainability factors. Therefore, the research investigated, and established the state of human settlements, Estate Management approaches and the methods practised; the type of maintenance utilised and the reason for the choice, human settlement management factors and the sustainable human settlement management factors.

The study also expressed the implications of the significance of these themes for the management of human settlements and it contended that there is a need to manage human settlements sustainably, to harness pre-conceived benefits.

The deficit in the major component of human settlement, housing, in Nigeria and in South Africa is widening, and the current stocks are also in deplorable condition, due to a lack of effective and efficient management, while sustainability concepts are ignored. The current trend if allowed to continue, will jeopardise the accessibility and benefits inherent in human settlements. These imperfections accentuate the need to evolve a proactive model to improve human settlements condition and to optimise the benefits of sustainability in the built environment of Nigeria and South Africa.

The study based on the findings in Chapters 5 and 6 ascertains and concludes as follows:

i.   The managers of human settlements are expected to be skilled in estate / property / Facility Management, and the majority of the respondents in Nigeria fit into these professions while in South Africa, the individuals within this space either belong to allied professions in the built environment or other non-allied professions. There is the need to professionalise this field in South Africa.

ii. The experience of most of the respondents in human settlements management ranges between one to ten (1 to 10) years and eleven to twenty (11 to 20) years, and they have the relevant experience from working with private-professional organisations, the government and as community representatives.

iii. For sustainability of the benefits of human settlements, identifying, understanding, evaluating, implementing and integrating monitoring, the appropriate Estate Management methods and maintenance approach in human settlements is essential, since it facilitates the enhancement of their poor conditions.

iv. The study has identified that benefits such as economic, financial, social, traditional, prestigious, political, and or other groups of benefits needed for human settlement inhabitants are essential.

v.   The study corroborates that the condition and the state of human settlements is a function of their age, the types of buildings and density.

vi. The study demonstrated that the outsourced Estate Management method was mostly used in the management of human settlements, rather than the partnership / hybrid of in-house

and outsourced alternative, which is indicated to offer tasks in an almost flawless manner for common goals and interests of stakeholders.

vii. The study also found that human settlements are mostly owned by the government at all tiers and most of them are completed and fully occupied.

viii. The study has established that the reactive maintenance approach is most often implemented in the current maintenance of human settlements. Unfortunately, this approach cannot improve the poor state of human settlements nor sustain its benefits. The planned preventive and planned corrective maintenance approaches are better, as they are more reliable, due to their prospective incentives.

ix. Forty-five (45) factors have a significant influence on the management of human settlements, and they are: lack of maintenance records, deficiency in policy monitoring, the training of management / maintenance personnel, the fiscal policy of government, non-implementation of policies, the procurement management method of the organisation, the motivation of management personnel, a lack of policy coordination, a lack of funds for management / maintenance activities, incoherent policies, the unavailability of policy review, a lack of needs assessment, adequate supervision of management and maintenance tasks, the maintenance policy of the organisation, the standard operating procedure of management organisation, dispute by inhabitants, weak government institutions, a poor land use management model, the ownership status of the house / land, default in the payment of rents / rates / taxes, the continuous political patronage, the conflict of interest of stakeholders, job specialization, the breach of covenant / contract by inhabitants, the location of the settlement / estate, the absence of public participation, the workplace hierarchy, incessant political propaganda, the availability of spare parts for maintaining infrastructure and equipment, a poor education and literacy level of inhabitants, the population density of the settlement / housing estate, a lack of qualified personnel, size of land / expanse of settlement, division of labour, software tools for maintenance activities, bad house designs, the presence of flood plains, the natural drainage basin of the area, the existence of water bodies, the vegetation of the area, the soil texture of the area, the embezzlement of funds allocated for management / maintenance, the greed of personnel involved in management / maintenance, bribery and the high interest rate on funds. The developed model, however, minimises these challenges.

x. The current practice of human settlement management for sustainability is ineffective. The human settlement managers must revolutionise their practices by practising increased

awareness and involvement of the relevant stakeholders, who have absolute and latent expectations for human settlements. This would ensure synergy and reduce the gap between the approach used and the expectations.

xi. The provision of necessary resources, workshops and training opportunities for the human settlements' practitioners and professionals would maximise the socio-economic value of all the stakeholders.

xii. The sustainability of human settlements remains a process that should ensure that the benefits of the original intent of providing them, are maintained and sustained. This validates the significance and the importance of sustainability in human settlement management. The research established five (5) factors as vital sustainability factors for the sustenance of human settlements. The factors identified are a human capital factor, the environmental factor, socio-economic factors, technological factors and legal factors.

xiii. These factors are established as having significant influence, and they must consequently be interconnected and resolved together, for the human settlement to realise the desired benefits, while ensuring the sustainability of the built environment.

xiv. The research proves that the model involves integrating the appropriate Estate Management and maintenance management approach, as well as critical sustainability factors. This is necessary for the sustainable management of human settlements in Nigeria and in South Africa and it will be useful for all critical stakeholders.

xv. Lastly, since the study has established that the human settlements' poor conditions and deficit drawbacks in Nigeria and in South Africa are further hampered by a lack of adequate provision for its management, the researcher has proposed a new model for addressing the challenges, as provided in Figure 6.1. The research suggests that the model should be implemented in human settlements management, in order to reduce if not totally eradicate their poor conditions; in addition to sustaining the benefits in the built environment. The model could further be a blueprint that would significantly enhance the success of human settlements projects and aid in sustaining existing settlements. Although the inherent truth, in this case, is to ask whether the stakeholders would continue to recognise the potential needs and the benefits of accessing good and high quality integrated human settlements for the people and the economy. Hence, the suggested model would be appropriate for human settlement management for sustainability; not only in Nigeria and in South Africa; but in other developing countries and the world in general.

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7.4 The Research Contributions to Knowledge

This research study has contributed to the body of knowledge in the area of human settlement management. There has hitherto been limited knowledge available on the subject, specifically for human settlements in Nigeria and in South Africa.

In this regard, the following contributions are presented:

i.   The research has developed a clear theoretical understanding of basic constructs and related concepts of human settlements, regarding its management in Nigeria and in South Africa. The consolidation of the relevant knowledge and its relationship to the quality of human settlements is a significant contribution to knowledge.

ii. The research has generated a qualitative and a quantitative assessment of human settlements within the Nigerian and the South African environment.

iii. The research has identified sustainable human settlement management as a missing link in the human settlement delivery process; a lacuna that has further created gaps within the need for housing.

iv. The research has provided an understanding of the barriers and the challenges of human settlement management practices within Nigeria and South Africa.

v.   The study has developed a bespoke model to achieve its objective of managing human settlements sustainably, thereby contributing to higher quality human settlements in the policy, practice and education perspective as:

   - a multi-dimensional tool to aid management decision-making for both existing and future human settlements, in a sustainable manner in practice;

   - a reference document that could be adopted by stakeholders to meet the challenges of human settlements; and

   - a future research opportunity to evaluate the effect of the model on human settlements in Nigeria and in South Africa.

Lastly, the realisation of the research aim underscores the need for professionalisation in human settlements management and the establishment of formal aspects of the built environment including necessary information to better reflect the emerging trends in the area of practice, better related to sustainable enhancement and improvement of human settlements in Nigeria and in South Africa and other developing climes.

7.5 Critical Evaluation of the Research Approach, Techniques and the Limitations of the study

Given the philosophical stance of this research, the approach adopted was mixed method, with review of books, journals, policies and other relevant literature, as well as questionnaires. The intention of the questionnaires was to validate the information provided in the literature, as well as providing the quantitative data for further validation. Although the research tilted more towards the quantitative method, the qualitative approach enabled the researcher to acquire a better perception of the stakeholders in the case studies, regarding human settlement management and how this influences its sustainability. The quantitative data retrieved using questionnaires and graphically illustrations gave credence to qualitative findings. Both methods were, however, utilised in a complementary way, to enable the researcher to avoid the weaknesses of each and to harness the benefit from their advantages.

Meanwhile, the study focuses on individuals (human settlements managers and professionals). In order to understand their insights of human settlement management in Nigeria and South in South Africa; the case study strategy was adopted. Thus, the result was a detailed description and understanding of the numerous issues associated with human settlement management. The choice of utilizing multiple case studies was because the researcher needed to investigate human settlement management activities and to establish whether the competencies or the inefficiencies existing in one case study were replicated in a different setting. This design was descriptive in nature and hence it afforded significant information about the individual case study.

The sampling strategy adopted for the study was purposive sampling for the questionnaire administration, and this was premised on the need for informative subjects who could contribute and expand the knowledge of the phenomenon under investigation. This approach facilitated capturing the views of the various participants.

The use of mixed method and case studies provided clarity and further enhanced the validity of the research. The data collected was presented in the form of tables, graphs and figures, and the findings were presented with a narrative interpretation.

The limitations of the case study research and the ways in which the researcher in this study attempted to overcome the limitations were discussed in Section 4.7.6. but there is a need for a brief restatement of the limitations in this section.

The concepts applied in this research were drawn from the review of literature and field surveys, as highlighted above. The data collection phase of the case study included questionnaire administration by means of a web survey on human settlement managers (professionals and non- professionals alike), and this generated some limitations to the study.

The nature of the topic and the strategic responses posed the first limitation of this study, as obtaining candid responses on sensitive information such as human settlement management was not easy. Indirect questioning was adopted during the questionnaire design, to minimise this limitation. The problem of the case study research posed another limitation, and the participants may not offer a true reflection of occurrences, either due to time constraints, interpretation of the questions or a lack of understanding. These issues are challenging, and they may not have permitted accurate information.

Coverage of this study was limited to Nigeria and South Africa and to purposively human settlement managers, as a compromise for in-depth studies. More representative views would have been obtained if other stakeholders were involved, but also the lack of time and the literature review minimised the influence of the limited scope of the reliability of the study findings.

Throughout the survey of the study, the respondents were also informed about the research and about their rights and they were also assured of anonymity and confidentiality. Gray (2003:19) considered this as a limitation because the researcher must consider numerous ethical concerns and responsibilities regarding the respondents. It is hence tricky, therefore, to assess the extent to which these assurances allayed the fears of the respondents in the study. Furthermore, the respondents may have conceived the research as a means of showcasing their displeasure or as a means of showing the inadequacies of human settlements management. There is, therefore, the possibility that the study might be negatively affected by these issues.

It has been contended that it is challenging to generalise findings for an entire population from a few case studies and that the objective of case studies is to establish general conclusions from particular facts and circumstances (Nieto & Perez, 2000), while the adoption of purposive sampling may have reduced the generalisability of the findings in this research, the adoption of the mixed method tackles the issue of generalisability in the research.

7.6 Recommendations

Based on the findings and the conclusions of this study, the following recommendations are made to enable the effective and the efficient management of human settlements, specifically in Nigeria and in South Africa. Human settlement owners must amend their current mode of utilising ineffective human settlement management practice approaches / style (that is outsourced management and reactive maintenance management) to that of a creative partnership with the inhabitants and professionals, as well as a planned preventive maintenance management approach. This is to ensure that the benefits and the sustainability of human settlements are both achieved. Human settlements should be managed by the integration of themes, as defined in the developed model.

The field of human settlement management should be professionalised, and staff capacity development and training programmes should be promoted and encouraged for human settlement managers. This would assist and promote the required awareness, understanding, identification, assessment and opportunities for the appropriate human settlement management players. In addition, the relevant authorities should ensure and promote a best practice approach that would enhance the sustainability of the benefits and the returns from the human settlements in the case studies.

Human settlement management policy should be formulated to include maintenance practices for the human settlement sector in Nigeria and in South Africa. This is to be sustained by a continuous cycle of monitoring, evaluation and reporting which would help to ensure that all stakeholders comply.

Funding oils the machine of the success of any business endeavour; hence, the management of human settlements is dependent on the available resources for the task. Consequently, it is suggested that adequate resources, whether financial or human, should be allocated and dispensed appropriately to human settlement management entities to uninterruptedly implement any management and maintenance tasks required by the human settlements, as promptly as possible.

Issues of transparency, accountability; professionalism and good governance are advocated, to provide a foundation for the implementation of the model, in order to achieve benefits and sustainability of the human settlements. Hence, all stakeholders should ensure that these vital issues are utilised for the benefit of human settlement management.

7.7 Recommendations for Further Research

Following the findings of the literature, subsequently supported by the empirical result of primary research findings, the study has identified additional areas for further research. Moreover, the present study cannot cover or examine all possible aspects of the themes within the study. Nonetheless, the researcher proposes that the following research fields could be investigated in the future:

- A comparative study of the management of human settlements in Nigeria and in South Africa should be conducted, to establish whether there are differences and variability in the processes employed in the various practices.
- A study should be conducted to investigate the nature and the extent of politics and policies in achieving an adequate management of human settlements.
- A study should also be conducted to further validate the model.
- A further study should also be conducted, to establish whether the workings of the professionalisation of the field of human management.

7.8 Caution

The utilisation and the quotation of this thesis should be done with caution, as the results and the conclusions are based on the chosen methodology.

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Appendices

Appendix 1: Topic Approval letter

NELSON MANDELA
U N I V E R S I T Y

PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa   mandela.ac.za

**FACULTY OF ENGINEERING,
THE BUILT ENVIRONMENT AND
INFORMATION TECHNOLOGY**
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25 March 2019

Student no: 217788173

Mr AA Adeniran
6 Adebayo Adeniran Close
Araromi Layout
P.O. Box 159
Oyo Town
NIGERIA
230

s217788173@mandela.ac.za

Dear Mr Adeniran

APPROVAL OF RESEARCH/PROJECT PROPOSALS

The following approval of research/project proposals was approved at a meeting of the Faculty PGS Committee held on 08 March 2019:

Student Name:	Adeniran, AA
Student Number:	217788173
Qualification:	Doctor of Philosophy in Construction Management
Title	**A MANAGEMENT MODEL FOR HUMAN SETTLEMENTS: A CASE STUDY OF NIGERIA AND SOUTH AFRICA**
Supervisor:	Prof B Botha
Co- Supervisor:	Prof S Mbanga

Please note that you are required to register annually until your studies have been completed and the degree has been conferred.

I wish you every success with your studies.

Yours faithfully

H Boshoff (Ms)
Faculty Administration

Appendix 2: Questionnaire

NELS☉N M▲NDELA
U N I V E R S I T Y

Faculty of EBEIT
Nelson Mandela University
Tel: +27 (0)41 504-2153 Fax: +27 (0)41-504-1948
E-mail Faculty Chairperson: Gerrit.Crafford@mandela.ac.za

Date:…………………March 2019
Ref: [H18-ENG-CMA-002]/Approval
Contact person: Prof. S. Mbanga

Dear Respondent,

INFORMED CONSENT DECLARATION

You are being asked to participate in a research study. We will provide you with the necessary information to assist you to understand the study and explain what would be expected of you (participant). These guidelines would include the risks, benefits, and your rights as a study subject. Please feel free to ask the researcher to clarify anything that is not clear to you.

To participate, kindly continue with the survey but kindly discontinue if you do not wish to participate.

However, should you wish to participate, your identity and information will at all times remain confidential. You also have the right to query concerns regarding the study at any time. Immediately report any new problems during the study, to the researcher. Telephone numbers of the researcher are provided. Please feel free to call these numbers.

Furthermore, it is important that you are aware of the fact that the ethical integrity of the study has been approved by the Research Ethics Committee (Human) of the university. The REC-H consists of a group of independent experts that has the responsibility to ensure that the rights and welfare of participants in research are protected and that studies are conducted in an ethical manner. Studies cannot be conducted without REC-H's approval. Queries with regard to your rights as a research subject can be directed to the Research Ethics Committee (Human), Department of Research Capacity Development, PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031.

If no one could assist you, you may write to: The Chairperson of the Faculty Postgraduate Studies Committee, PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031.

Yours sincerely

Adeleye Ayo ADENIRAN s217788173 (Researcher)

NELSON MANDELA

UNIVERSITY

Department Construction Management, North Campus, Summerstrand, Port Elizabeth, RSA

Dear Participant,

Cover letter

My name is Adeleye A. ADENIRAN (Mr) and I am a Doctoral Candidate of Construction Management at the Nelson Mandela University. For my research, I am working on the topic "**A management model for human settlements: A study of Nigeria and South Africa**."

I am inviting you to participate in this research study by completing the attached surveys. The following questionnaire will require approximately 10-20 minutes to complete. There is no compensation for responding nor is there any known risk. To ensure that all information will remain confidential, please do not include your name.

If you choose to participate in this project, please answer all questions as honestly as possible and return the completed questionnaires promptly. Participation is strictly voluntary, and you may refuse to participate at any time. The data collected will provide useful in developing a framework for the management of human settlements for sustainability.

Completion and return of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me at the number listed below. If you are not satisfied with the way this study is being conducted, you may report (anonymously if you so choose) any complaints to the Nelson Mandela University.

Thank you for taking the time to assist me in my educational endeavour.

Sincerely,

Adeleye A. ADENIRAN

s217788173@mandela.ac.za

Promoter	Co- Promoter
Prof. Sijekula Mbanga	Prof. Brink Botha
Sijekula.mbanga@mandela.ac.za	Brink.Botha@mandela.ac.az

Questionnaire

A MANAGEMENT MODEL FOR HUMAN SETTLEMENTS: A STUDY OF NIGERIA AND SOUTH AFRICA

Instruction: Please, kindly read this questions and tick /answer as appropriate,

Section A: Biographic Data

1. **Gender:**   Male ☐   Female ☐

2. **Age**:   18-30 ☐   31-45 ☐   45- 60 ☐   Above 60 ☐

3. **Kindly identify your highest education level.**

No formal education ☐   SSCE/High School/ Matric/TVET ☐

Undergrad Diploma/Degree ☐   Honours/BSc(Nigeria) ☐   Masters/PhD ☐

4. **Kindly indicate your profession**…………………………………………………………….

5. **Years of experience in housing management/human settlement**.

Less than 1year ☐   1-10 years ☐   11-20 years ☐   21-30 years ☐

Above 30 years ☐

6. **Type of organisation.**

Tenant/resident ☐   Professionals/Contractors ☐   Local/Municipal ☐

State Housing Corp/ Provincial DHS ☐ Federal Housing Authority/National DHS ☐

Community Representative   ☐ Others (Please specify) … … … … … … … … … . .

7. **Level of involvement in the management of human settlements.**

Extremely involved ☐   Very involved ☐   Moderately Involved ☐

Slightly Involved ☐   Not Involved ☐

Section B: Physical conditions/situation of Integrated human settlements.

8. **Location of human settlement/housing estate**...

9. **Age of human settlement/housing estate.**

Less than 1year ☐　　　　1-10 years ☐　　　　11-20 years ☐　　　　21-30 years ☐

Above 30 years ☐

10.　　**Density of human settlement/housing estate.**

Low Density ☐　　Medium Density ☐　　High Density ☐　　　Mixed density ☐

11.　　**Types of buildings in the human settlement/housing estate**.

Terraced Bungalows ☐　　Detached Houses ☐　　Condominium ☐

Block of flats ☐　　　　　　Others………………………………………………….

12. **Physical state of the following in the human settlement/Housing Estate?**

Component	Very poor (Functionally Obsolete)	Poor (Partially defective)	Acceptable (Aesthetically Obsolete)	Good (Visually appealing)	Very good (Visually appealing and functional)
Electricity supply[2]					
Floor[1]					
General environment[1]					
Paintings[1]					
Road Network[2]					
Roof condition[1]					
Security[2]					
Walls[1]					
Waste disposal[2]					
Water supply[2]					
Windows[1]					

Key: [1] are physical components while [2] are services

Section C: Human Settlement Maintenance Management

13. **Management approach used for human settlements.**

Unaware ☐   None ☐   In house ☐   Outsourced ☐ Partnership/hybrid ☐

Unsure ☐

Asides the approaches listed above, please name/describe any other management approaches for human settlements that you are aware of………………………………………………… …………………………..…………………………………………………………………………… …………………………………………………………………………………………………..

14. **Ownership status of the settlement managed.**

Private ☐   Local/Municipal Government ☐

Provincial/State Government ☐   National/Federal Government ☐ Unsure ☐

15. **Maintenance types adopted in the management of housing estates/human settlements under your portfolios (Please tick all that apply)**

Unplanned Maintenance ☐   Reactive Maintenance ☐

Planned corrective Maintenance ☐   Planned preventive Maintenance ☐

Unsure ☐ Unaware ☐ Others (Please specify) … … … … … … ..… . . . .

16. **Reasons for choice(s) ticked in 15 above:**

Cost effectiveness ☐ Time ☐ Suitability ☐ Availability of personnel ☐

Required by policy ☐ Others (Please specify) … … … … … … ..… . . . .

17. **Rate the typical maintenance condition in your neighbourhood.**

Very Poor ☐   Poor ☐   Fair ☐   Good ☐   Very Good ☐

18. **Level of completion of your housing / Human settlement.**

Incomplete and Unoccupied ☐   Incomplete and occupied ☐   Complete and

occupied ☐   Completed and Unoccupied ☐   Abandoned and Vandalized ☐

19. **Please indicate "X" the extent to which you disagree or agree with the following.**

Human settlement management is affected by:	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Workplace hierarchy					
Job specialization					
Division of labor					
Standard operating procedures of management organization.					
Weak Government Institutions.					
Bribery					
Conflict of interest of stakeholders.					
Embezzlement of funds allocated for management.					
Greed of personnel involved in management.					
Lack of fund for management/ maintenance activities.					
High interest rate on funds.					
Fiscal policy of government.					
Poor education and illiteracy of inhabitants.					
Ethnicity of inhabitants.					
Norms and traditions of inhabitants.					
Population density of the settlements					
Religious belief of the inhabitants.					
Maintenance policy of the organization.					
Procurement management method of the organization.					
Lack of qualified personnel.					
Adequate Supervision of management and maintenance.					
Training of management personnel.					
Availability of spare parts of infrastructure and equipment.					
Motivation of management personnel.					
Software tools for maintenance activities.					
Lack of needs assessment.					
Incoherence policies.					
Non-implementation of policy.					

Lack of policy coordination.					
Deficiency in policy monitoring.					
Unavailability of policy review.					
Continuous political patronage.					
Incessant political propaganda.					
Bad housing designs.					
Poor land use management model.					
Absence of public participation.					
Size of land/settlement area					
Elevation of the site.					
Natural drainage basin of the neighbourhood.					
Presence of flood plains and slopes.					
Existence of Water bodies.					
Soil texture of the site.					
Vegetation of the locale.					
Location of the town.					
Ownership status of the houses/land					
Breach of covenants by the inhabitants.					
Default in the payment of rents/rates/taxes.					
Disputes by inhabitants.					
Dearth of maintenance records					

Others (Please specify)…………………………………………………………………………….
………………………………………………………………………………………………………..
. ……
……………………………………………………………………………………………………..

Section D: Human Settlements Sustainability Issues

20. **Do you know about the concept of sustainability and the issues surrounding it?**

Yes ☐   No ☐   Unsure ☐

21. **Do you understand the concept of sustainable development/management and the issues surrounding it?**

Yes ☐   No ☐   Unsure ☐

22. **Please rate your understanding and awareness of the concept and the issues.**

Poor ☐   Fair ☐   Good ☐   Very Good ☐   Excellent ☐

23. Do you consider this concept and its issues significant for effective management of human settlements?

Yes ☐   No ☐ Unsure   ☐

24. Please indicate "X" the extent to which you disagree or agree with the following.

Sustainable management of human settlement is affected by:	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Inhabitants Income					
Age grade of inhabitant.					
Education level of the inhabitants					
Education level of management personnel.					
Technology used in management exercise					
Professional expertise involved in management exercise					
Population density of the settlement					
Scale of unemployment					
Policy framework for management/maintenance					
Tenure of the inhabitants					
Title deed/documentation					
Participation of the community					
Security of tenure					
Social Position of inhabitants					
Occupation					
Safety of life and property					
Security of tenure					
Socio-economic position of the inhabitants					
Social justice system of the community					
Available land mass					
Elevation of the land area					
Natural drainage basin of the site					
Flood plains and slopes available					
Water bodies within the vicinity					
Soil texture and quality					
Natural vegetation of the zone					
Technology used in building					
Time available for maintenance/ management.					

25. **Are you aware of any model, template or guideline that considers sustainability features and maintenance practices for the effective management of human settlements?**

Yes ☐   No ☐   Unsure ☐

26. **If   yes   to   25   above,   please   list them**……………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

27. **Do you think having such a model for the management of human settlement for sustainability is important?**

Yes ☐   No ☐   Unsure ☐

28. **If yes to 27 above, kindly state why you think such a model is important**

………………………………………………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

29. **Kindly give any recommendations as to issues that will enhance the development and practicability of such a model.**

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....

....

Thanks for your participation

Sincerely,

Adeleye A. ADENIRAN (0789138640)

s217788173@mandela.ac.za

*Kindly provide your email below if you would want a feedback from the result of this study……………………………………………………………………………………..

Appendix 3: Ethical clearance letter

NELS●N M▲NDELA
UNIVERSITY

PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa   mandela.ac.za

Chairperson: Research Ethics Committee (Human)
Tel: +27 (0)41 504 2235
charmain.cilliers@mandela.ac.za

Ref: [H18-ENG-CMA-002] / Approval]

22 January 2019

Prof S Mbanga
Faculty of EBEIT

Dear Prof Mbanga

A MANAGEMENT MODEL FOR SUSTAINABLE HUMAN SETTLEMENTS: COMPARATIVE STUDY OF NIGERIA AND SOUTH AFRICA

PRP: Prof S Mbanga
PI: Mr A Adeniran

Your above-entitled application served at the Research Ethics Committee (Human) for approval.

The ethics clearance reference number is H18-ENG-CMA-002 and is valid for one year. Please inform the REC-H, via your faculty representative, if any changes (particularly in the methodology) occur during this time.

An annual affirmation to the effect that the protocols in use are still those for which approval was granted, will be required from you.

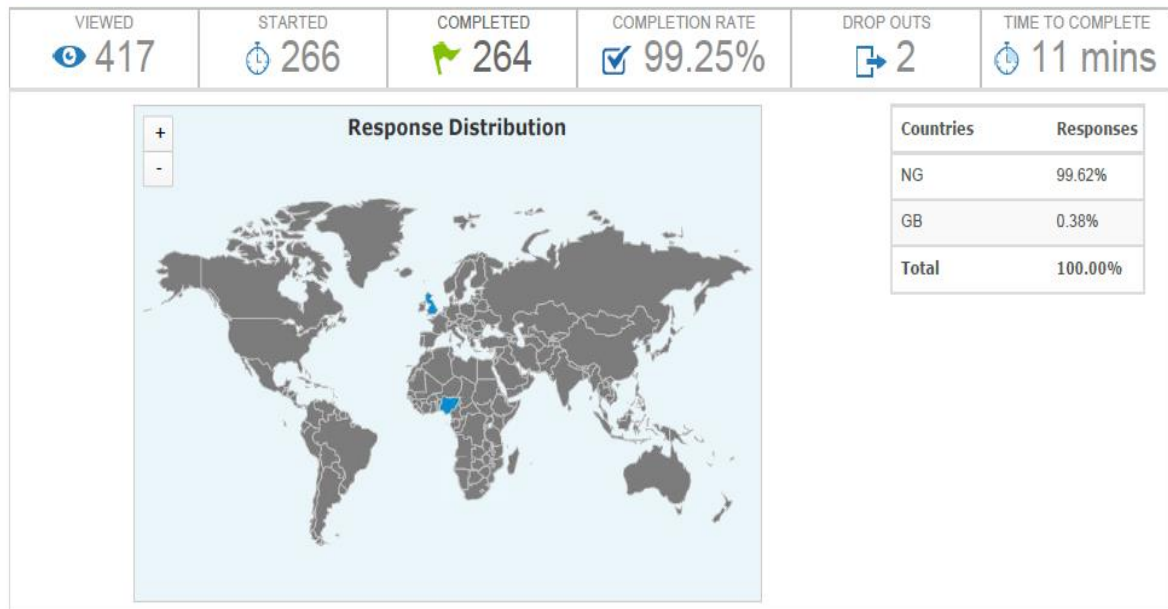We wish you well with the project.

Yours sincerely

Prof C Cilliers
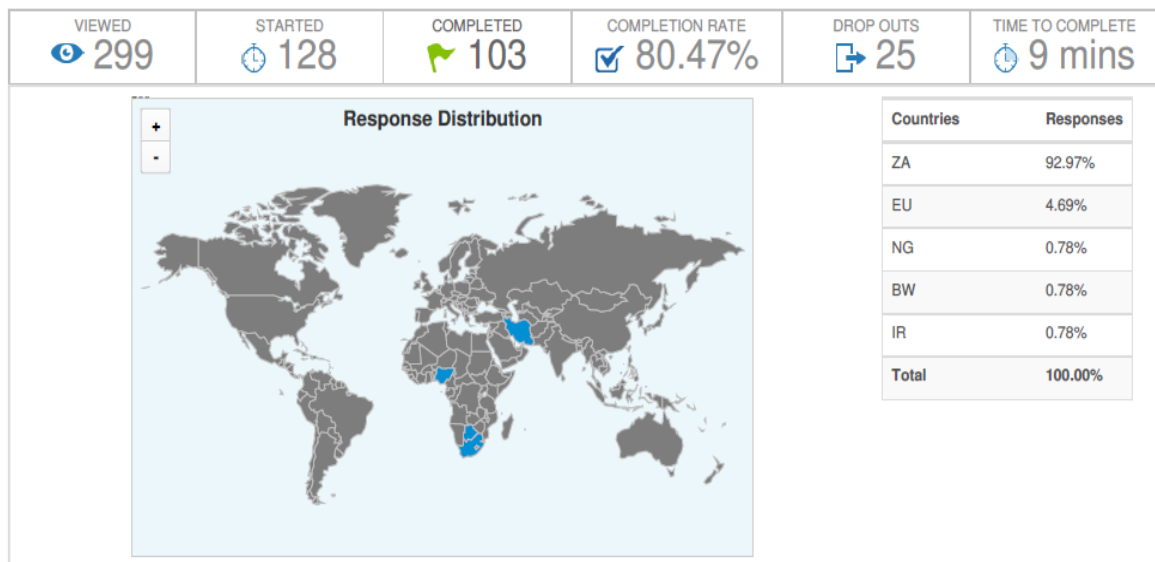Chairperson: Research Ethics Committee (Human)

Cc: Department of Research Capacity Development
        Faculty Officer: EBEIT

Appendix 4: Screenshot of Questionpro® on closure of survey

A management model for sustainable human settlements-Nigeria -Dashboard

VIEWED	STARTED	COMPLETED	COMPLETION RATE	DROP OUTS	TIME TO COMPLETE
👁 417	⏱ 266	⚑ 264	☑ 99.25%	⤷ 2	⏱ 11 mins

Response Distribution

Countries	Responses
NG	99.62%
GB	0.38%
Total	100.00%

A management model for sustainable human settlements - Dashboard

VIEWED	STARTED	COMPLETED	COMPLETION RATE	DROP OUTS	TIME TO COMPLETE
👁 299	⏱ 128	⚑ 103	☑ 80.47%	⤷ 25	⏱ 9 mins

Response Distribution

Countries	Responses
ZA	92.97%
EU	4.69%
NG	0.78%
BW	0.78%
IR	0.78%
Total	100.00%

Busy Bee
EDITING

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Website: www.busybeeediting.co.za

Proofreading and Editing Certificate

TO WHOM IT MAY CONCERN

This is to certify that we Brenda van Rensburg and Hugo Chandler the owners of the above company are both professional freelance proof-readers and editors. For the past twelve years we have been providing proofreading, editing, layout, syntax, spelling and grammar checks as well as typing and graphic design services to university students and to graduates for their theses, reports and dissertations, as well as to authors for their manuscripts. We will gladly provide any references if needs be.

We have completed the proofreading, editing, layout, syntax, spelling and grammar check on an 83 448 word / 261-page **PhD THESIS** for ADELEYE AYOADE ADENIRAN, STUDENT NO.: 217788173 submitted in Fulfilment of the Requirements for the Degree of Doctor of Philosophy in Construction Management at The Department of Construction Management, School of Built Environment, Faculty of Engineering, the Built Environment and Information Technology at the Nelson Mandela University.

Brenda van Rensburg

Brenda van Rensburg

Hugo Chandler

Hugo Chandler

Date: 16 November 2019