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AN INVESTIGATION OF THE FACTORS REQUIRED TO IMPROVE THE QUALITY OF LOW-COST HOUSES IN ETHEKWINI MUNICIPALITY, KWAZULU NATAL

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A research report submitted to the Faculty of Engineering and the Built Environment, University of Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science MSc in (Building) Construction Project Management

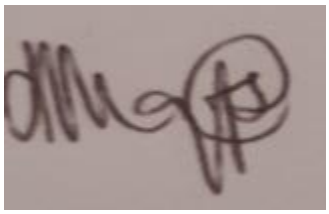


School of Construction Economics and Management
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04 September 2017

DECLARATION

I, Luleka Nqentsu, declare that the entirety of this research report is my own original work. It is being submitted to the School of Construction Economics and Management at the University of Witwatersrand, Johannesburg for the Master of Science (Building) Construction Project Management. It has never been submitted before for any degree or examination to any other University.



Luleka Nqentsu 04 September 2017

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Finally, I wish to thank the Almighty God for making it all possible.

LIST OF ACRONYMS

ACRONYM	DESCRIPTION
BNG	Breaking New Ground
CIDB	Construction Industry Development Board
CPF	Central Provident Fund
DoHS	Department of Human Settlements
DoPW	Department of Public Works
IDT	Independent Development Trust
HDB	Housing and Development Board
KZN	Kwa Zulu Natal
NDoHS	National Department of Human Settlements
NHBRC	National Home Builders Registration Council
NURCHA	National Urban Reconstruction and Housing Agency
PAP	People's Action Party
QA	Quality Assurance
QC	Quality Control
QM	Quality Management
QMP	Quality Management Plan
QMS	Quality Management System
RDP	Reconstruction and Development Programme
RHLF	Rural Housing Loan Fun
SIT	Singapore Improvement Trust
SHF	Social Housing Foundation
SHRA	Social Housing Regulatory Authority
TQM	Total Quality Management
UNCESCR	UN Committee on Economic, Social and Cultural Rights

ABSTRACT

Access to housing and safe accommodation is an essential part of the South African government's commitment to poverty relief and the improvement of the wellbeing of its people. Despite the substantial commitment and progress by the South African government towards ensuring adequate housing, much still needs to be done to combat the existing challenges facing the low-cost housing industry. Amongst various challenges, the low-cost housing sector faces challenges of poor quality houses. The level of dissatisfaction due to poor quality appears to be dominant in the low-cost housing sector. These challenges are crucial as the impact is severely noticeable, both socially and economically.

The literature reviewed and the data collected is indicative that the use of emerging contractors who are likely inexperienced in the construction of low-cost houses is one of the major contributing factors to the poor quality of the end product. Emerging contractors form a majority of the construction contractors in the country and have been identified to play a vital role in the construction of low-cost houses. Constraints experienced by emerging contractors are posing risk to the projects and pose a challenge to the successful completion of these projects. The under-development of emerging contractors has resulted in poor workmanship and poor quality low-cost houses.

Subsequent to the identified problem areas, this study on investigation of the factors required to improve the quality of low-cost houses in eThekwini municipality, KwaZulu Natal was initiated. The research objectives pursued by this study aimed to compare the contributing factors to the poor quality of low-cost houses as perceived by housing project managers and emerging contractors; to compare key factors that can be improved to enhance the quality of low-cost houses as perceived by project managers and emerging contractors; and to identify quality management mechanisms currently available in the construction of low-cost houses and determine their influence level.
A mixed research methodology was employed, using the survey method as the research design and data collection, through semi-structured questionnaires. The questionnaires were hand delivered to forty (40) participants and twenty seven (27) responses were received and analysed, which comprised ten (10) project managers and seventeen (17) emerging contractors.

Results from the study showed that there are undeniably issues of poor quality that include foundation failures, structural cracks and leaking roofs in the low-cost housing sector in eThekwini, KwaZulu Natal. It is evident from the analysis that there are many probable underlying causes to the poor quality of low-cost houses, which include: lack of continuous development for emerging contractors; insufficient subsidy amounts; the use of inferior materials; and the use of unskilled labourers on site. The results of the study indicated that shortcomings exist in terms of the necessary skills among emerging contractors, which means there is a huge need for continuous training on different important skills. The need for training of emerging contractors is enormous and that all aspects in terms of training should be considered to be of equal importance. It can also be determined that there is a lack quality management framework within the department and the municipality. These quality management frameworks need to be developed to ensure improvement in quality of the low-cost houses.

Keywords:

Emerging Contractors, Improve, Low-cost Housing, Poor Quality, Subsidy,

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CHAPTER 1

RESEARCH STUDY CONTEXT DESCRIPTION

1.1 Introduction and Background

The purpose of this study is to report on an investigation conducted to identify factors contributing to the poor quality of low-cost houses and to determine significant factors required to improve the quality of low-cost houses in eThekwini Municipality, KwaZulu Natal.

Access to housing and safe accommodation is an essential part of the South African government's commitment to poverty relief and the improvement of the wellbeing of its people. The decision to build social housing often hinges on two considerations, economic cost and social need. Although these considerations are important, there is an alternative use for such housing that of creating empowered and emancipated citizens (Gunter, 2013).

The South African Constitution (1996) enshrines the right of everyone to have access to adequate housing. The Constitution makes it mandatory for the state to ensure that it achieves this right for all South Africans. In response to the Constitution's command, the state, through the Housing Act (1997), has presented a variety of programmes which will provide deserving South Africans access to housing opportunities. Since 1994, the South African government has also developed and implemented several housing policies, delivery programmes and subsidy mechanisms to ensure access to adequate housing.

The government initiated the construction of Reconstruction and Development Programme (RDP) housing units in order to address the severe housing shortage in South Africa. The RDP aims at redressing the imbalances of the apartheid legacy by providing decent housing to poor people who were victims of the land segregation policy by the apartheid government. Through the RDP, low-cost houses are provided to deserving poor South Africans for free, through a variety of government housing subsidy schemes. The Department of Human Settlements (DoHS) is committed to the National Development Plan's 2030 vision of transforming human settlements and the

spatial economy to create more functionally integrated, balanced and vibrant urban settlements.

Despite the commitments, interventions and achievements by government and other stakeholders in meeting the requirements of the Constitution, the challenge in providing access to adequate housing is growing (DoHS, 2014/15). Service delivery concerns have been a regular debate and are highly publicised (CIDB, 2011). This is supported by Moola *et al.* (2011) in stating that there has been profound criticism with regard to the inferior building standards and quality of these RDP housing units, as well as the lack of services and amenities in these development projects.

The challenges faced by South Africa's housing sector can be categorised quantitatively and qualitatively. Firstly, quantitatively, there is a huge housing backlog in the country and the number of quality units delivered is incomparable to the growing demand for low-cost houses (Khoza and Kabir, 2014). Secondly, qualitatively, a number of the low-cost houses delivered are reportedly defective (Zunguzane *et al.* 2012). Levels of dissatisfaction appear to be dominant in the low-cost housing sector (Khoza and Kabir, 2014). Among the key challenges that the construction industry sector faces are matching supply of and demand for affordable housing (Zainun, *et al.* 2016). Burgoyne (2008) agreed with this statement by saying that many communities over the years have shown their growing dissatisfaction over the government's observed poor service delivery levels. This is also supported by Roslan, *et al.* (2013) in stating that the demand of low cost housing has been higher than the available number of houses. Zainun, *et al.(* 2016) states the importance of predicting the low-cost housing demand to match the demand and supply so that the government can plan the allocation of low cost housing based on the demand. The qualitative challenges is very crucial in the housing sector as its impact is severely noticeable both socially (well-being of beneficiaries) and economically.

Having acknowledged the challenges of poor quality low-cost houses, the National Department of Human Settlements (NDoHS) introduced a Housing Rectification Programme. The aim of the programme is to correct the defects identified in low-cost houses resulting from poor workmanship (DoHS, 2008). The province of KwaZulu Natal is categorised as the second most highly affected (province) by the poor quality of low-cost houses nationally (DoHS, 2014/15).

The housing sector possibly has a vast role to play in the revival of the South African economy. The Department of Human Settlements, through its White Paper, emphasizes; restoration of human dignity and value for money. Both these require undivided attention to the quality of houses delivered and the establishment of sustainable and habitable environments (NDoHS, 1994). Wentzel (2010) stated that quality is compromised due to a lack of acceptable quality criteria stipulated for middle management and site management regarding housing. Furthermore, Wentzel (2010) stated that the lack of management support for the development and implementation of quality management systems (QMS) during the design and construction of low-cost housing projects directly results to deficiencies in workmanship. This is confirmed by Rwelamila (1995) who stated that lack of quality management implementation and non-adherence was the most common cause for quality problems. However, questions regarding the factors affecting quality management in public building construction processes remain unanswered. Hence the initiation of this study, which aims at investigating factors affecting the quality of low-cost houses and factors that, will contribute to improving the quality.

1.2 Research Problem

The study's main concern is the quality challenges facing the low-cost housing industry in the eThekwini Municipality of KwaZulu Natal (KZN) province that have a noticeable impact, both socially and economically.

The right to adequate housing is one of the most significant basic human rights. It speaks to the restoration of dignity to the millions of South Africans who have been relegated for years and who still suffer from the legacy of apartheid's selective development. As a result, access to housing and safe accommodation is an essential part of the South African government's commitment to poverty relief and improvement of the wellbeing of its people. Since 1994, the South African government has developed and implemented several housing policies, delivery programmes and subsidy mechanisms to ensure access to adequate housing. The government initiated the building of Reconstruction and Development Programme (RDP) housing units in order to provide housing to the previously disadvantaged and to address the severe housing backlog that has developed in South Africa in recent years (Moolla *et al.*

2011). However, inspite of the good intentions, the challenge in providing access to adequate housing is growing. There has been profound criticism with regard to the inferior building standards and quality of these housing units, as well as the lack of services and amenities in these developments (Moolla *et al.* 2011). This is supported by (Khoza and Kabir, 2014) in stating that levels of dissatisfaction appear to be dominant in the low-cost housing sector.

These houses of inferior quality often require remedial works which costs governments huge amounts of money. According to Zainun *et al.* (2016) among the key challenges in construction industry sector faces are matching supply of and demand for affordable housing. It is very crucial to predict low-cost housing demand to match the demand and supply so that the government can plan the allocation of low cost housing based on the demand.

Subsequent to the challenges facing the low-cost housing industry, the need to identify the factors which affect the quality and how these can be improved was identified and this research study was initiated.

1.3 Research Aim

The aim of the study is to identify factors contributing to the poor quality of low-cost house with a view to determine significant factors required to improve the quality.

1.4 Research Objectives

The research objectives pursued for this study are:

(a) To compare the contributing factors to the poor quality of low-cost houses as perceived by housing project managers and emerging contractors in eThekwini Municipality.

(b) To compare key factors that can be improved to enhance the quality of low-cost houses, as perceived by project managers and emerging contractors.

(c) To identify quality management mechanisms currently available in the construction of low-cost houses and determine their influential level.

1.5 Research Questions

The research problem discussed earlier has given rise to the following questions, which the study intends to answer:

(a). What are the major contributors to the poor quality in the construction of low-cost houses as perceived by project managers and emerging contractors in eThekwini Municipality, KZN?

(b). What are the influences required to enhance the quality of low-cost houses?

(c). What are the existing quality management mechanisms employed in the construction of low-cost houses?

1.6 Importance of the Research

The outcomes of this study will provide a better understanding of the fundamental problems affecting the delivery of quality low-cost houses and, in the process, contribute to identifying essential aspects that will assist in improving the quality of low-cost houses in the province of KwaZulu Natal. The study will benefit the government, housing consumers, the construction industry and other housing stakeholders.

1.7 Delimitation of the Research

Participants in the study are drawn only from the province of KwaZulu Natal, in particular under the eThekwini Municipality. The study will only give consideration for participation to housing project managers and emerging contractors within the municipal area under study. The research study is then restricted only to the opinions of the selected participants.

1.8 Overview of the Research Method

The aim and objectives of this study were achieved by means of the following research methods and structure:

- An extensive literature review was conducted on topics related to the quality of low-cost houses;
- The objectives of this study were realised through the use of a mixed methodology design. Semi-structured questionnaires were employed as the technique to collect data from the selected sample; and
- Respondents chosen for the study were low-cost housing emerging contractors and housing project managers within the eThekwini Municipality. The targeted sample size was forty participants, which comprised thirty emerging contractors and ten officials. A total of twenty seven responses were received and analysed.

1.9 Structure of the Research Report

Chapter 1: Chapter one provides the introductory description and context of the study and also details the research problem statement, research questions, aim and objectives of the study conducted.

Chapter 2: The chapter provides a comprehensive review of the existing literature on the subject of the study, which aims at establishing the theoretical framework for the study and identifying the existing gaps.

Chapter 3: This chapter provides an overview of the research design and discusses the data collection methodology selected for this study. The chapter also covers aspects of ethics and integrity considerations.

Chapter 4: The chapter discusses data collection, analysis and discussion of the results.

Chapter 5: This chapter summarises the entire study and tables the main findings and conclusions; provides recommendations; and suggests possible future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The objective of this chapter is to provide an insight into the existing knowledge relevant to the study in order to identify important facts and background information related to the study. The chapter also aims to identify, from previous studies, the factors that contribute to the poor quality of low-cost houses; to identify the existing quality management frameworks, their impact within the low-cost housing industry; and existing gaps in order to improve quality.

Complaints about poor quality in low-cost houses are a reflection of several effects, namely poor designs and inappropriate construction techniques; poor workmanship; and low quality building materials leading to many other related defects. The South African Government is spending large amounts of money rectifying defective houses, money which could allow the department to focus on building houses for those still waiting and to mitigate the huge backlogs (Sisulu, 2014). The Public Finance Management Act of 1999 states that the department is answerable to the public for its expenditure on housing initiatives. South African legislation compels all spheres of government to ensure proper spending of public funds in a cost effective, transparent and equitable manner (RSA 1999 - PFMA).

Amongst the many factors contributing to the poor quality of low-cost houses, the use of emerging contractors who are likely inexperienced enough in the construction of low-cost houses is one of the contributing factors to the poor quality of the end-product. Emerging contractors play a vital role in the construction of low-cost houses. In spite of the government's sound and articulated emerging contractor development initiatives, these contractors are still highly challenged. Constraints experienced by emerging contractors are imposing risks on the projects and pose a challenge to the successful completion of the projects. The under-development of emerging contractors has resulted in poor workmanship and the poor quality of low-cost houses.

Housing quality has many elements and can be defined in many ways. According to best practise in quality management (BPQM, 2007) a good quality house is a strong, durable and defect free house constructed by the correct usage and application of building materials. A number of attributes are identified that may be used to describe quality, namely, Performance, Reliability, Durability, Serviceability, Conformance, Features, Aesthetics and Perceived quality (Mitra, 1998). In the case of the eThekwini Municipality low-cost houses, as indicated by the results of the rectification programme data, the low-cost houses do not meet these requirements of a good quality house.

2.2 Housing Background and Legislative Framework in South Africa

The right to have access to adequate housing is one of the most important of all basic human rights and is globally recognised by different human rights instruments. Section 26 of the South African Constitution, (1996) makes the following statements in relation to the provision of housing in South Africa:

a) Everyone has the right to have access to adequate housing;

b) The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of this right; and

c) No one may be evicted from their home or have their home demolished without an order of court made after considering all the relevant circumstances.

Government housing development therefore originates from the South African Constitution (SERI, 2011). The Constitution makes the provision of housing mandatory for the state in ensuring the achievement of this right. Therefore, it is the government's role to promote the effective right to housing for all citizens of the country, within the available resources and other applicable limitations. Accessibility to adequate housing then means that the state must create conducive conditions for all its citizens to access affordable housing.

The provision of adequate housing entails more than just bricks and mortar. It requires a number of conditions to be met, like availability of land and appropriate services. This is further emphasized by the UN Committee on Economic, Social and Cultural

Rights (UNCESCR), which states that there are certain conditions to be met to ensure the complete enjoyment of the right to housing. These conditions are: legal security of tenure; affordability; availability of services; habitability; accessibility; location; and cultural adequacy. According to UNCESCR, adequate housing has to protect one from natural elements, provide suitable living space, be appropriately located, have adequate privacy, adequate security, structural stability and durability.

2.2.1 Legislative and Policy Framework

The South African government, in order to achieve the Constitutional imperative through the Housing Act, (Act No 107 of 1997) and since 1994, has passed numerous legislation and policy developments to enable the provision of good quality adequate houses to its citizens. The policy principles stipulated in the White Paper on Housing aimed to provide poor households with houses, as well as basic services such as potable water and sanitation on an equitable basis. The South African government has intensified its housing delivery programmes to ensure that it meets its obligations to progressively realise this right for all citizens. The Acts and Policies have clear directives and aims at promoting the development of low-cost houses. They serve as guidance in the process of housing delivery. These housing policies have now been in place for over twenty years (SAIRR, 2015):

(a) New Housing Policy Strategy for South Africa 1994 (The White Paper)

The White Paper sets out the initial plans for government to position its actions efficiently and effectively towards its objectives. It establishes the policy making methodology and outlines government's implementation plans. According to the White Paper 1994, one of the important interventions required of government will be to provide a variety of options for the rapid attainment of secure tenure.

(b) Housing Act 107 of 1997

The Housing Act 107 of 1997 is a primary part of housing legislation in South Africa. It was passed to ensure that housing objectives are achieved. It provides for the facilitation of a sustainable housing development process and lays down roles, responsibilities and functions of the three spheres of government; National, Provincial and Local government (SERI, 2011).

(c) Restitution of Land Rights Act 22 of 1994

The Act's main objective is to provide the restitution of rights in land to persons or communities disposed of such rights after 19 June 1913 as a result of past racial discriminatory laws or practices, as well as to establish a Commission on Restitution of land Rights and Land Claims Court.

(d) Extension of Security of Tenure Act 62 of 1997

The objectives of this Act are to provide for measures to facilitate long-term security of land tenure; to regulate the conditions of residence on certain land; to regulate the conditions and circumstances under which the right of persons to reside on land may be terminated; and to regulate the conditions and circumstances under which persons, whose right of residence has been terminated, may be evicted from land.

(e) National Housing Code (2009)

The National Housing Code sets out the fundamental policy principles, guidelines and norms and standards which apply to the National Housing Programme. It is the confirmation of the existing housing policy. Its objective is mainly to create sustainable housing developments through quality and durable products that comply with the minimum required standards, while giving effect to the objectives of the Housing Act (DoHS, 2009). The Code is binding on provincial and local spheres of government.

2.2.1.1 The Role of Different SA Government Spheres in Housing

The different spheres of government play an important role in the provision of housing in SA. These spheres are obligated by the Housing Act to prioritise the needs of the poor in relation to housing developments. It is the responsibility of these government spheres to ensure that there are extensive choices in housing developments that are economically, socially and financially affordable and sustainable.

Sphere 1: The National Government - The National government's responsibility is to establish and maintain a sustainable national housing development process. It does this by developing policy and strategy; determining delivery goals; monitoring and evaluating the housing sector's performance; establishing a national funding

framework for housing development; setting national delivery goals; and monitoring housing delivery performance in relation to funding allocations.

Sphere 2: Provincial Government - Provincial governments promote, co-ordinate and implement housing programmes within the framework of the national housing policy. Provinces approve housing subsidies and projects and provide support to local governments for housing developments. Provinces also assess municipalities' applications for accreditation to oversee national housing programmes, and will be responsible for monitoring the performance of accredited municipalities.

Sphere 3: Local Government - Municipalities have a responsibility to ensure that, within the framework of national policy and provincial guidelines, citizens within their jurisdictional areas have access to adequate housing. Municipalities select, plan and manage land for housing development in line with the housing priorities identified in their integrated development plans (IDPs). They initiate, plan, co-ordinate and facilitate appropriate housing development within their boundaries.

2.3 Housing in South Africa

The provision of adequate housing to deserving South Africans is an attempt to reduce poverty and improve the quality of people's lives for the homeless and others who are inadequately housed (DoHS, 2004). Because of the various challenges immediate to this provision, there have been resultant backlogs; poverty and unemployment; lack of economic progress; and destructive behaviours with financial constraints.

Despite all the challenges and delays, the SA government took reasonable measures within its available resources to achieve the realisation of the constitutional right by making promises to provide shelter to all deserving people through the enhancement of the low-cost housing policy. The development of housing for the poor in South Africa is divided into two: Firstly, to fast track housing delivery to accommodate homeless people; and secondly, to empower, support and enable beneficiaries to build their own houses (Campbell and Mshumpela, 2008).

Housing the poor in developing countries has been the focus of many development debates internationally. In realising the right to access adequate housing, the South

African government's vision as stipulated in the National Housing Code (2009) advocates for ''sustainable housing and a sustainable environment''.

In 1994, millions of people in South Africa did not have adequate houses. These millions stayed in informal houses, overcrowded backyard shacks or far from where they worked. The housing shortages in developing countries has been mostly attributed to high poverty rates; high numbers of low-income groups that cannot afford formal houses; increasing urbanisation; and population growth; which then contributes to the growth of informal settlements and urban housing demand all over the world (World Bank, 2002). According to the United Nations Human Settlements Program (UN-Habitat, 2003) "the worsening state of access to shelter and security of tenure results in severe overcrowding, homelessness and environmental health problems".

In ensuring that the right to a good quality adequate house is realised, the South African government has developed and implemented several housing delivery programmes and subsidy mechanisms in order to expedite the provision of houses. The Reconstruction and Development Programme (RDP) is one of the programmes developed by government to redress the imbalances of the apartheid legacy. The provision of decent housing to poor South Africans who were victims of the land segregation policy by the apartheid government is one of the important aspects addressed by the RDP. One of the major focuses of the RDP was the provision of housing to the homeless.

2.3.1 Low-Cost Housing in South Africa

Subsequent to South Africa's 1994 elections, the housing backlog and slum living conditions became a central concern of the new government. Issues of land, housing and tenure rights have been at the forefront of the democratic government's priorities. South African citizens expected that government will immediately remedy some injustices of the past in a fair and transparent manner.

A "Low-cost house" is a house provided by government to low earning beneficiaries through different housing subsidies (DoHS, 2014/15), with the assumption that low-cost houses do not depict compromised performance. Low-cost houses are provided in various forms: there is free housing provided to the poor and mostly these

categories fall within the indigent category and are unemployed. There is also low-cost rental housing, which is occupied by low income earners who cannot afford bonded houses, yet financially they fall above the margins for free low-cost houses (DoHS, 2014/15).

The provision and delivery of low-cost houses is highly acknowledged by the South African government, which has shown commitment to providing sustainable human settlements to improve the quality of households for the poor (DoHS, 2009). The Housing White Paper (1994) described the provision of housing in South Africa as one of the country's biggest challenges. However, since 1994 the South African government, in its efforts to fulfil the right of access to housing opportunities, has provided about 4,3 million houses and subsidies (President Zuma - SoNA, 2016). Furthermore, as part of government's continuous process to delivering housing opportunities and combating housing shortages and demands, the South African Department of Human Settlements (DoHS) has developed goals on both a long-term and short-term basis. On a long-term basis, DoHS vision for 2030 posits that government aims to provide houses and services in rural and urban areas. This commitment focuses on the total eradication of backlogs of more than 2,1million housing units, which translates to about 12, 5 million people (DoHS, 2014/15). On a short-term basis, the government and human settlements stakeholders have committed to delivering 1,5 million housing opportunities by 2019 (DoHS, 2014/15). The commitment by banks, developers, mining companies and big employers officially declared South Africa as the biggest construction site in Africa and the developing world (DoHS, 2014/15). This makes South Africa one of the countries that have delivered the highest number of low-cost houses to the poor through various mechanisms in order to realise the requirements of the Constitution, which calls for adequate houses for all (Public Service Commission, 2003).

Despite significant achievements and commitments by government and other related stakeholders, South Africa still faces a growing challenge of providing citizens with access to quality housing. The Housing White Paper (1994) stated that the human settlements sector in SA remains one of the most challenging areas in the social and economic environment. Affordable housing is however not unique to South Africa, but is a worldwide challenge to national governments and has gained prominence in countries where many of its citizens are poor (Ebert, 2005). This reflects in worldwide

trends as population explosions continue to create an increasing demand within the property market for well-located land and housing.

2.3.2 Housing Subsidy Scheme

In promoting the right to adequate housing for all and addressing the issues of backlog, government initiated a housing subsidy scheme as a mechanism which will assist poor citizens to access adequate housing. Since the commencement of the housing subsidy scheme in 1994, the delivery of housing has been mainly developer-driven, with most housing projects being funded through the project-linked subsidy mechanism (DoHS, 2014/15).

A “housing subsidy” is a once-off grant by government to qualifying beneficiaries for housing purposes (DoHS, 2014/15). The grant is not paid in cash to beneficiaries, but is accessed by a municipality which employs developers / contractors to purchase land and develop houses that comply with the minimum technical norms and standards. Subsidies are meant to support project-based developments; individual transactions on new and existing residential properties; social housing schemes; rental housing schemes; and 9, in certain instances, retrospective subsidization on previous site and service schemes implemented by Government and the Independent Development Trust.

The National Housing Code (2009) outlines the following qualifications required for housing subsidy benefits:

- Resident: He or she is a lawful resident in South Africa.
- Competent to contract: A person who is legally competent to contract (i.e. 18 years of age, legally married or legally divorced and of sound mind) may apply for subsidisation.
- Monthly combined household income (R0 - R3500 - R7000): Persons who qualify may apply for housing subsidies.
- Individuals who have not received a subsidy before: Neither that person nor his or her spouse has previously derived benefits from the housing subsidy scheme.

- Individuals who have not owned a property before: Persons may only qualify for vacant serviced site purchase. However, if the person has obtained a residential property without government assistance and complies with other requirements, the person may apply for a housing subsidy.
- Individuals with dependants, married or those co-habiting with partners.
- Persons who are beneficiaries of the Land Restitution Programme (LRP): Beneficiaries of LRP complying with other qualification criteria may apply for housing subsidies.
- Persons classified as aged: aged persons who are single without financial dependants may apply for subsidisation.
- Persons classified as military veterans: Military veterans who are single without financial dependants may apply for subsidisation.
- Persons classified as disabled: Persons who are classified as disabled whether single, married or co-habiting or single with financial dependants may apply for housing subsidisation.

2.3.3 Types of Low-Cost Housing Subsidy Schemes

The housing subsidy aims to assist low earning South African citizens with housing opportunities. Hence, these houses are named Low-cost Houses (DoHS, 2009), bearing in mind that low-cost houses do not depict a compromised performance. Government has developed a number of new housing subsidies and updated certain existing schemes to satisfy the current needs. The level of income for each beneficiary determines the type of subsidy scheme to employ.

The different housing subsidy schemes that DoHS is implementing as mechanisms to ensure the successful delivery of houses are;

i) Individual subsidies: This is a subsidy for low-income households wishing to buy residential property for the first time, provided that they acquire a housing loan from a registered financial institution. Applicants should qualify for subsidy requirements as stated above.

ii) Consolidation subsidies: This is a subsidy scheme for people who have previously received a subsidy, live on a serviced site and want to build a

better house-such as building a top structure. These people were previously financed by the previous housing dispensation.

iii) Institutional subsidies: This is a subsidy for non-profit organisations like churches, local authorities or housing associations that want to provide rented accommodation to people from lower income groups.

iv) Rural subsidies: This is a subsidy available to people who do not have formal tenure rights to the land on which they live. The subsidy is available only on a project basis.

v) Project-linked subsidies: This subsidy may be used towards the purchasing of a new house and the land on which it stands, in an approved municipal housing project.

2.3.4 Housing Institutions

To attain the goals of providing houses, a number of bodies were established and tasked to assist government. These include:

a) National Home Builders Registration Council (NHBRC) – It is a national council established in terms of the Housing Consumer Protection Measures Act 95 of 1998. Its mandate is to protect the interests of housing consumers by providing warranty protection against defects in new houses, as well as to provide protection against any failure of builders to comply with their obligations in terms of the act.

The Warranty Scheme ensures that all new homes build from the 1st April 2002 under the government subsidy scheme are fit for habitation; built in a workmanlike manner; comply with the NHBRC technical requirements; carry a one-year roof leak warranty from the home builder; and carry a five-year major structural defects warranty from the homebuilder; which is supported by the NHBRC fund. The NHBRC generates most of its funding through registration fees.

b) The Housing Development Agency (HDA) is a national public entity created in 2009 by the Housing Development Agency Act 23 of 2008. It is responsible for the acquisition, management and release of state- and privately-owned land for human settlements development, with providing project delivery support services to municipalities and provinces.

(c) Social Housing Regulatory Authority (SHRA) – Was established in August 2010 by the Minister of Human Settlements in terms of the Social Housing Act, No. 16 of 2008. The SHRA objective is to regulate and invest in order to deliver affordable rental homes and renew communities.

(d) National Housing Finance Corporation (NHFC) – The National Housing Finance Corporation (NHFC) was established by the National Department of Human Settlements as a Development Finance Institution (DFI) in 1996, with the principal mandate of broadening and deepening access to affordable housing finance for low-to-middle income South African households.

(e) National Urban Reconstruction and Housing Agency (NURCHA) - NURCHA is a Section 21 company, which is an innovative development finance company that provides bridging finance and construction support services to contractors and developers. It is precisely developed to provide construction finance and support for contractors and developers who cannot easily access finance from conventional financial institutions.

(f) Rural Housing Loan Fund (RHLF) - The RHLF was created in 1996 with a mandate to help low-income earners access small loans. It facilitates housing microloans through an intermediary or retail housing finance lenders.

(g) Social Housing Foundation (SHF) - The SHF develops “a vibrant and sustainable social housing sector for South Africa”. This is done through the creation of credible social housing institutions (SHIs).

2.3.5 Housing Regulations/ Guidelines

The South African housing industry has an existing number of norms and standards that were established for the purpose of guiding and regulating the housing industry in general. These are:

a) National Housing Code (2009): Technical and General Guidelines

The National Housing Code sets out the fundamental policy principles, guidelines, norms and standards which apply to National Housing Programmes. Its objective is mainly to create sustainable housing developments through quality and durable

products that comply with minimum required standards, giving effect to objectives of the Housing Act (DoHS, 2009).

b) National Home Builders Registration Council (NHBRC)

The National Home Builders Registration Council was established in terms of the Housing Consumer Protection Measures Act 95 of 1998. It was launched in 1995 to monitor and regulate the housing industry for both the private and subsidy sectors, protects the interests of housing consumers; and to ensure delivery of sustainable and quality houses. The legislative framework furthermore stipulates that all houses constructed are enrolled; comply with the norms and standards of the National Building Regulations and minimum technical standards of the NHBRC; and are constructed by builders that are registered with the NHBRC.

c) Guidelines for Human Settlement Planning and Design

The Guidelines for Human Settlement Planning and Design, commonly known as the Red Book, is a South African publication aimed at providing practical guidance to built environment professionals in support of the creation of sustainable and vibrant human settlements. It provides performance-based guidelines for informed decision-making. The purpose is essentially to indicate the qualities that should be sought in South African settlements, as well as to provide practical guidance on how these qualities can be achieved. The document is therefore intended to be educative, providing ideas and useful information, and not as a substitute for innovative planning and engineering practice. The purpose of this document is not merely to assist professionals in producing efficiently serviced 'townships', but rather to create sustainable and vibrant human settlements (CSIR, 2005).

d) National Building Regulations and Standards

The National Building Regulations and Standards objectives are to provide for the promotion of uniformity in the law relating to the erection of buildings in the areas of jurisdiction of local authorities and for the prescribing of building standards.

2.4 Quality Management in the Context of Housing

This section of the study reviews the relevant literature and currently implemented existing Quality Management Systems in the low-cost housing industry. The factors that contribute to the poor quality of low-cost houses, their impact and areas of improvement are discussed.

Quality in the housing context means fitness of the house for meeting or exceeding its intended use as perceived by the housing beneficiaries. In the construction industry, quality is defined as a totality of features required by a product or service to satisfy a given need - “fitness for purpose” (Chan and Chan, 2004). However, the way in which quality is determined is by the extent to which a product or service successfully serves the purpose of the user during usage.

According to Evans and Lindsay (2008) and Mitra (1998), the definition of quality can be divided into the following approaches; (i) Product-based approach; (ii) User-based approach; (iii) Value-based approach, (iv) Manufacturing-based approach; and (v) Transcendent-based approach.

(i) Product-based approach

This approach recognizes specific features or attributes that can be measured to indicate higher quality. It defines quality as a specific and measurable variable.

(ii) User-based approach

In the user-based approach, the quality definition is based on the assumption that quality is determined by what a customer wants (Evans and Lindsay 2008). Each person has different wants and needs, hence different quality requirements, leading to a user- based approach. This approach is a subjective view of quality.

(iii) Value-based approach

Pohl (1996) stated that “quality is a degree of excellence at an acceptable price and the control of variability at an acceptable cost”. The value-based approach assumes that consumers’ purchase decisions involve trading quality against the price. This therefore means that this approach defines quality in terms of costs.

(iv) Manufacturing-based approach

The manufacturing based approach of quality is defined by Evans and Lindsay (2008) “as the desirable outcomes of engineering and manufacturing practice, or conformance to specifications”.

(v) Transcendent-based approach

According to this approach, quality is a noticeable property through experience and is not easy to analyse. In this approach quality can be defined as goodness or excellence of something. This means that one will automatically tell it when seeing it.

According to Best Practice in Quality Management (BPQM) (2007), a good quality house is a strong, durable and defect-free house constructed by the correct usage and application of building materials. This can be achieved through a collective effort of different stakeholders from builders, material manufacturers/ suppliers to the beneficiaries. This is affirmed by Mitra (1998), who identifies a number of attributes that may be used to describe quality, namely: Performance, Reliability, Durability, Serviceability, Conformance, Features, Aesthetics and Perceived quality.

A poor quality house is then described as a complete opposite of the above description of a good quality house.

2.4.1 Project Quality Management

Project Quality Management refers to the process required to ensure that the project will satisfy the needs for which it was undertaken. Project quality management as defined by the PMBOK Guide, Management Institute (2008) includes processes and activities of performing organizations that determine quality policies, objectives and responsibilities so that the project will satisfy the needs for which it was undertaken. The requirements of project quality management can be implemented by means of quality planning, quality control and quality assurance (PMBOK Guide, Management Institute, 2008).

The BPQM further specifies that the quality control system addresses the use of materials, craftsman qualifications, installation instructions, contracts and job-site inspections.

2.4.2 Quality Management Frameworks

The Quality Management Framework is the strategy, advice, guidance and tools necessary for an organization to attain quality, efficiency and effectiveness in performing its responsibilities (Yue *et al.* 2011). Quality management ensures consistency of an organization's product or service. It has three key components: quality planning, quality assurance and quality control. Quality management is focused not only on product and service quality, but also on the means to achieve it. Quality management therefore uses quality assurance and control of processes, as well as products, to achieve more consistent quality. The three basic components of quality management are:

(i) Quality Planning

Quality Planning is the process of identifying quality requirements and standards for the project/ product and documenting how the project will demonstrate compliance to quality requirements and standards (PMI, 2008). Establishing project requirements for quality begins at project inception, hence the emphasis on planning.

(ii) Quality Assurance

Quality Assurance is the process of ensuring that appropriate guidelines, approaches, requirements and procedures for managing project quality are implemented as planned and that the quality team works within expected performance levels. The quality assurance activities are managed under the rules and standards documented in a quality assurance plan template approved by the project manager (PMI, 2008).

Quality Assurance plays a great role in the low-cost housing sector. It ensures that there is systematic monitoring and evaluation of various aspects such as design processes and workmanship characteristics, of a project in order to ensure that standards of quality are being met (PMI, 2008). It should be performed throughout the project, with the aim of having a formal system that continually reviews the effectiveness of the quality attitude of the organisation (Mitra, 1998).

(iii) Quality Control

Quality Control is a process that measures and monitors specific project quality results against the baseline to determine if they comply with relevant standards and identifies different approaches to eliminate the causes of unsatisfactory performance (PMI,

2008). Mitra (1998) described quality control as the system that is used to maintain a desired level of quality in a product or service which may be achieved through different measures like planning; design; use of proper equipment and procedures; inspections; and actively taking corrective measures where a deviation is observed between the products, services or process output and a specified standard.

2.4.3 Quality Terms Definitions

Quality: is the degree of added value to products and/or service delivery as perceived by all stakeholders through conformance to specification and the degree of added excellence to product and/or service delivery through a motivated workforce, in order to meet customer satisfaction (Oschman, *et al.* 2006).

Total Quality Management (TQM): as defined by Anantharaman, *et al.* (2001), is an approach for continuously improving the quality of every aspect of business life. It is a never-ending process of improvement of individuals, groups of people and the whole organisation.

Project Quality Management (PQM): It is the process required to ensure that the project will satisfy the needs for which it was undertaken.

Quality Management System (QMS): This is a management tool consisting of a set of rules to guide an organization with regard to quality. It is intended to assist in establishing policy and objectives and in achieving those objectives.

Quality Management: The co-ordinated activities to direct and control an organization with respect to quality.

Quality Objectives: Performance indicators for measuring the progress of the quality system. For example, the number of hours of staff training per year, the number of discharge measurements made, etc.

Quality Manual: Document that defines the scope of the Quality Management System and that outlines documentation related to the standard to be achieved. It includes or references documented procedures and describes how processes interact to form the QMS.

2.4.4. Quality of Low-Cost Housing Projects

Quality is a fundamental aspect in the construction industry (Zunguzane, *et al.* 2012). Failure to achieve such a crucial aspect of construction can be detrimental to the successful execution of the project. This is affirmed by Bubshait (1999) who states that quality management is important in the engineering and construction industry because of the risk involved. Failure to ensure quality management can contribute to project cancellations. Poor construction quality disrupts construction projects, causing re-work, delays, cost overruns and customer dissatisfaction, all of which can be prevented (Caicedo, 2011). According to Oakland and Tanner, (2007) it is vital to understand the client requirements in order to understand the fundamental project expectations related to cost, quality and time. This is supported by Chan, *et al.* (2006) who stated that poor quality management of projects could result in cost and time overruns, which could influence the quality requirements of the project. The cost of quality deficiencies leading to re-works varies from 5% to 10% and even 15% of the total contract value (Caicedo, 2011).

One of the requirements stated by the Constitution of RSA in the context of housing is sustainability. Kamaruddeen, *et al.* (2011) define sustainability as satisfying the needs of the present generation while protecting the needs of future generations in aspects such as the economy, social well-being, technical ability and the environment. The South African government policy on housing for the poor was originally based on maximizing the volumes of delivery (DoHS, 2004). However, Minister of Housing, Lindiwe Sisulu, in media article said that the need is not to only push for quantity, but also highly consider quality and correct past errors.

Over the years since 1994, the South African government has displayed enormous commitment to providing housing rights despite many challenges. The number of quality units delivered is incomparable to the growing demand for low-cost houses (Khoza & Kabir, 2014). The housing supply is still low and poor quality appears to be dominant in the low-cost housing sector, regardless of government efforts to accelerate the momentum for housing delivery (Khoza and Kabir, 2014). A number of low-cost houses recently delivered are reportedly defective (Zunguzane, *et al*. 2012).

Non-compliance with quality can result in delays and requirements for re-works which can result to significant loss. This statement is supported by Arditi and Guyadin (1997) who state that great expenditures of time, money and resources, both human and

material, are wasted each year because of inefficient or non-existent quality management procedures.

Despite the commitments, interventions and achievements by government and other stakeholders in meeting the housing commands by the Constitution, a challenge in providing access to adequate housing is growing (DoHS, 2014/15). Moola, *et al*. (2011) state that there has been profound criticism with regard to the inferior building standards and quality of the RDP housing units, as well as the lack of services and amenities in these development projects. Concerns have been raised about the increasing, non-compliance of materials and products despite the well-developed set of national standards that enables manufacturers and contractors to provide consumers with high quality products (CIDB, 2007). Criticism with regard to inferior building standards and the quality of those housing units, as well as the lack of services and amenities in these development projects, is increasing (Moola and Block, 2011).

The continued lack of adequate housing and basic services (water, sanitation and electricity), growing unemployment and a largely unresponsive state, particularly at the local level, have resulted in an increasing number of so-called 'service delivery protests' in townships and informal settlements across South Africa (SERI, 2011). Burgoyne (2008) stated that many communities over the years have shown their growing dissatisfaction over the government's observed poor service delivery levels. The scale of the housing problems confronting the South African government is enormous (Wilkinson, 1998).

The construction industry is an important player in the economy of South Africa. Government is the single largest construction client, representing between 40%-50% of the entire domestic construction expenditure in the country (Ncwadi and Dangalazana, 2005). A study by Caicedo (2011) revealed that a major challenge for the industry during the past decades has been to deliver high quality projects efficiently and effectively. The Financial and Fiscal Commission Chairperson (Khumalo, 2013) stated that the key challenge around the quality issues is that there is no adherence to norms and standards and where those have been adhered to, the places or settlements that have been created have been found not to be safe for living or habitation, so they have to be destroyed. CIDB (2011) indicated that the lack of quality in construction is manifested in poor or non-sustainable workmanship. The

CIDB report also highlighted that there are high levels of client dissatisfaction in the residential building sector.

According to Zunguzane, *et al.* (2012), the principal causes of defects in low cost-income houses is alleged to be related to the use of emerging contractors who are likely inexperienced, as well as to the use of unskilled labour by contractors. NHBRC, in their Builder's Bulletin Statement in 2004, has indicated that there is a need for better workmanship on projects as there is evidence of poor quality being delivered by emerging contractors. Quality is the assurance of the product that persuades the customer or the end-user to purchase or use. The relation between specifications and good workmanship is one way of measuring quality. However, from the literature reviewed and data collected relating to the quality of low-cost houses this has not been fully achieved. Poor workmanship affecting the quality of the end-product has a direct link to time constraints and cost reductions made during the project construction process.

It is indicative from the housing rectification programme assessment findings that there is a widespread occurrence of poor quality in low-cost housing. The issues of poor quality identified have led to the initiation of this study to examine ways to improve the quality of low-cost houses. This means finding ways of making sure that everyone can have access to safe, decent and affordable housing and ensure that public funds are not spent in rectifying quality faults that could have been managed at the initial stages of the process. The benefits of improved quality will ensure that all housing, regardless of cost, should meet basic standards of liveability.

2.4.5 National Housing Rectification Programme

In respect of the widespread quality concerns noted in the low-cost housing sector, the South African government introduced a National Housing Rectification Programme.

The National Department of Human Settlements acknowledged that there were widespread deficiencies and introduced a National Rectification Programme that is aimed at correcting the defects identified in low-cost houses resulting from poor workmanship. The introduction of the rectification programme was adapted by all nine provinces in their Human Settlements Developmental Plans.

Between 2011 and 2015, the Department of Human Settlements has spent over R2 billion rectifying the defective government subsidy houses resulting from poor and sub-standard quality (DoHS, 2014/15). The most affected three provinces by the shoddy housing workmanship where government has spent more money in rectification programmes are: (1) Eastern Cape, (2) KwaZulu Natal and (3) Gauteng. These three provinces accounted for the bulk of expenditure under the rectification programme. Hence, the study is focused on aspects that will contribute to improving the quality low-cost houses in KwaZulu Natal.

2.4.5.1 Housing Rectification Process

The rectification programme follows the following process:

- Local Municipalities will identify projects with defective houses;
- A suitable professional will be appointed to conduct a forensic engineering assessment of the identified defective houses;
- The assessment professionals will prepare a technical report that provides; detailed assessment findings, remedial recommendations for the defects and cost estimates for the remedial work;
- The Municipality will then make an application to the Provincial Housing Department for the required rectifications;
- The Municipality appoints a contractor registered with the National Home Builders Registration Council to undertake the rectifications;
- Rectification work is complete and works is certified; and
- Provincial Housing Department pays the contractors for the rectification work.

The objective of these assessments is to determine defects/ non- compliance; indicate for each the probable cause; formulate rectification methods; and quantify and cost the proposed repair methods. The defects are categorised as follows:

(i) Non-Structural Defects – only moderate rectification work required;
(ii) Minor Structural Defects – extensive rectification work required; and
(iii) Major Structural Defects – demolition and rebuilding is required.

2.4.5.2 Housing Rectification Programme in KwaZulu Natal

The KwaZulu Natal province is categorised as the second province most highly affected by poor quality of low-cost houses nationally (DoHS, 2014/15). From 2011 to 2016 over 50 000 housing units were recommended and submitted for the rectification programme in the KwaZulu Natal province.

Between 2011 and 2015, in the KZN DoHS, eThekwini Municipality has had the highest number of subsidy housing units assessed for rectification funding in KwaZulu Natal. Therefore, this study will particularly focus in this province.

As part of the literature review for this study, an analysis of the findings from the rectification programme was conducted with the aim of determining the extent of defects identified during assessment and to determine probable causes of poor quality in low-cost houses. In this regards, secondary data was obtained from the NHBRC through Rectification Programme Assessment Reports (RPAR) for eThekwini Municipality, KZN.

In the implementation of the rectification programme, the NDoHS engaged NHBRC to assist in its capacity as the housing regulator and quality assurer. The NHBRC involvement in the process entails the identification and structural assessment of the affected projects and the production of assessment reports. The final reports produced by the NHBRC will include the assessment findings, probable solutions, cost estimates and final recommendations.

The data collected by NHBRC during the assessment comprised quality details of each low-cost housing unit under the rectification programme. In answering the research questions and meeting the objectives of this research study, the assessment data collected by the NHBRC was considered appropriate secondary information to be utilised. The consent for the researcher to use the assessment data for the purpose of this research was granted by NHBRC. The data to be used will only be a portion of what was collected for the region concerned in the study i.e. eThekwini Municipality in the KwaZulu Natal Province. The data is document-based text material in the form of an assessment report.

The reports by the NHBRC indicated that, on average a project of 1500 units identified and assessed for rectification showed that about 10% of the low-cost housing units were confirmed to be defective. Consequently, these low-cost housing units have

items that will adversely affect their strength, stability, durability and the serviceability of the housing unit. A major defect warrants recommendations to demolish and rebuild these low-cost housing units. The data indicated that the other remaining percentage of the assessed low-cost units will require a series of defects rectification in order for it to be of the required quality standards.

The most prevalent defects as highlighted by the NHBRC reports are:

- Poor storm water controls;
- Structural failures due to poor founding conditions;
- Structural cracks on walls and surface beds;
- Unavailability of reinforcement;
- Poor designs;
- Poor workmanship;
- Roof structure damages; and
- Defects due to inferior quality materials being used.

This then depicts that issues of poor quality in low-cost houses are indeed huge in the province.

According to Zunguzane, *et al.* (2012) the defects identified in poor quality low-cost houses in the country mostly relate to the following principal causes: poor workmanship; use of emerging contractors with no experience; and the use of unskilled labourers. DoHS Eastern Cape Province (2009) stated that people who worked on the housing projects are not trained people, hence all the defects in the houses occurred. NHBRC, on its website (NHBRC, 2002), identifies the shortage of project management skills, construction and financial management skills as major challenges.

Issues of poor quality low-cost houses in South Africa are enormous and are costing government large amounts of money. Minister Lindiwe Sisulu was quoted as saying “let us cut waste’’, adding that the money used in the rectification programme could allow the department to return its focus to building houses for those still waiting and mitigate the backlog (Sisulu, 2014). The DoHS, through its White Paper, emphasizes restoration of human dignity and value for money. Both these require undivided attention to the quality of houses delivered and the establishment of sustainable and habitable environments (NDoHS, 1994). From the literature reviewed and the data

collected, it is indicative that the use of emerging contractors who are likely inexperienced in the construction of low-cost houses is one of the contributing factors to the poor quality of the end-product. Emerging contractors are one of the vital players in the construction of low-cost housing. Due to the high involvement of emerging contractor' in the construction of low-cost housing, this study also focuses on them as the target sample group. The focus will be on their development and contribution to the low-cost housing industry in South Africa.

2.5 Emerging Contractors in the Construction Industry

Definitions of emerging contractor can vary from the different fields of the construction industry and between countries. The Construction Industry Development Board (CIDB) defines an emerging enterprise as "an enterprise which is owned, managed and controlled by previously disadvantaged persons and which is overcoming business impediments arising from the legacy of apartheid" (CIDB, 2008). An Emerging Contractor, as defined by DoHS, is a sole trader, partnership or a legal entity which adheres to statutory practices and is registered with NHBRC; with a CIDB grading of 1 to 3; and is under a mentorship or incubator programme'' (DoHS, 2010). The National Small Business Act No 102 of 1996 defines small contractors as those contractors that employ between five (5) and fifty (50) people, while medium is ranges between five (5) and two hundred (200) people. These potential entrepreneurs are mainly non-whites who were marginalized in the old South Africa and excluded from participating in the higher spheres of the building industry, working as labourers and lower grade artisans (Murray and Appiah-baiden, 2000).

Since the birth of democracy, the South African construction industry is experiencing growth in the number of emerging contractors. The construction industry comprises a large number of emerging contractors, which form an important part of the industry (Benjaoran, 2009). The South African construction industry plays an important role in the economy of the country (Dlungwana, *et al.* 2002). These contractors fill a vital gap in the construction industry as they are always ready to carry out the very small and odd projects that the big, well-established companies would not find profitable (Murray and Appiah-baiden, 2000). Emerging contractors occupy a large percentage of the CIDB Contractors register and are highly involved in the construction of low-cost

houses, which makes them generally powerful potential generators of income and employment creation in South Africa.

The South African government is committed to ensuring that black-owned companies have access to the construction sector (DoHS, 2010). Government encourages emerging contractors to participate in the mainstream economy. The promotion of emerging contractors is generally government's approach to creating employment opportunities, alleviating poverty and promoting economic growth.

In spite of the government's sound and articulated emerging contractor development initiatives, these contractors are still highly challenged. The literature advised that a number of factors contribute to the high failure rate in the development of emerging contractor companies in the South African construction industry. Literature suggests that management of a construction organisation requires the combination of various skills: technical, managerial, financial, political and social. Some of the skills required to manage an emerging construction company can be attained through experiential training.

2.5.1 Emerging Contractors and the Quality of Low-Cost Houses

Housing policies support the eradication of poverty through housing provisions. Economic policy promotes local development and employment opportunities. Housing and Economic policies show a clear indication of co-ordination towards the development of emerging contractors. Emerging contractors are widely employed in the low-cost housing sector. These contractors occupy about 80% of the CIDB register.

From the literature reviewed and the collected data, it is indicative that the use of emerging contractors in the construction of low-cost houses is one of the contributing factors to the poor quality of the end-product. According to Zunguzane, *et al.* (2012), the principal causes of defects in low-cost income house is alleged to be related to the use of emerging contractors who are likely inexperienced. Even though the government aims to address the emerging contractors, due to their lack of amongst many things, education and training, they have failed to deliver projects effectively and efficiently. NHBRC, in their Builder's Bulletin statement in 2004, concurs in stating that there is a need for better workmanship on projects being delivered by emerging

contractors as there is evidence of poor quality. The poor delivery by emerging contractors is found to be attributed to a lack of planning, control and scheduling of construction projects using formal professional project management practices (Bigelow, 2001).

Emerging contractors, by nature, are relatively small companies with limited financial resources and little managerial experience. According to the NHBRC (Builder's Bulletin, 2004), "because of lack of professionalism and sustainability, homebuilders have a life-span of six months in the industry, since they experience cash flow problems in their projects."

In spite of the government's sound and articulated housing development initiatives, the country has a huge housing backlog and most houses built are of poor quality and not habitable state. According to Martin and Root (2010), emerging contractors have a tendency to fail to develop into a sustainable enterprise due to a number of factors. Government has invested many resources in contractor development. However, emerging contractors still face enormous challenges. In some cases, emerging contractors have encountered difficulties in maintaining quality standards (Murray and Appiah-baiden, 2000).

2.5.2 Challenges Facing Emerging Contractors in South Africa

Constraints experienced by emerging contractors are exerting risks on the projects and pose a challenge to the successful completion of the projects (De Wet, 2008). According to Thwala and Mvubu (2008), the lack of success facing emerging contractors is as a result of the following challenges: financial problems; skills problems; delays in payments; lack of access to credit facilities; lack of access to work opportunities; technical and managerial skills; effective management during the early stages; proper training; entrepreneurial skills; and resources. This statement is supported by other researchers like Thwala and Phaladi, (2009); Ncwadi and Dangalazana (2006). About 70%-80% of small businesses fail within the first five years of business in South Africa. CIDB (2004) reports that SMEs lack the necessary management skills in the industry and this prevents the effective implementation of various project management techniques. Poor delivery by SMEs in South Africa is found to be attributed to a lack of planning, control and scheduling of construction

projects (Moilwa, 2013). Croswell and McCutcheon (2001) argue that small contractors can be economically useful if projects are designed to suit their capacity.

2.5.3 Construction Industry Development Board (CIDB)

The Construction Industry Development Board is an organisation mandated through the Construction Industry Board Act 38 of 2000 to support contractor development and emerging sector participation throughout government and industry. It is a statutory body for reform and improvement of the construction sector for effective delivery, to provide leadership to stakeholders as well as to enhance the role of the industry in the country's economy. CIDB's Annual Report (2004/2005) has accurately summarised the mandate of CIDB as follows: "provide strategic direction and develop effective partnerships for growth, reform and improvement of the construction sector; promote sustainable growth of the construction industry, as well as sustainable participation of emerging contractors; promote improved performance and best practices; promote improved procurement and delivery management; and develop methods for monitoring and regulating the performance and registration of projects and contractors".

CIDB is a vital part of South Africa's construction industry, which plays a remarkable role in economic and social development by providing physical infrastructure (Moilwa, 2013). This research encompasses a consideration of emerging contractors and their development and contribution to low-cost housing industry in South Africa. It is for this reason that a brief description on CIDB is provided.

In terms of Section 5 of the CIDB Act 2000, the board is mandated to register, regulate, manage and maintain contractors in South Africa. The CIDB contractor register has nine (9) grades, which are determined by the contractor's financial capacity and works capability. This enables different sectors to access a contractor's ability to undertake a respective project (www.cidb.org.za). Dlungwana and Rwelamila (2003) state that contractors can be distinguished from each other by variables such as annual turnover, capacity and capability. Emerging contractors on the CIDB register hold the highest number (CIDB, 2015).

2.5.4 Contractor Development in South Africa

The South African government has put in place numerous resources ranging from enabling legislation laws and regulations to the funding of development programmes to assist and support the development of emerging contractors. Contractor development aims to create opportunities for emerging contractors to build capacity, capability and sustainability in order to play a meaningful role in infrastructure development. It also promotes empowerment to redress historical imbalances (CIDB, 2015).

The importance of emerging contractors in the economy of South Africa and other countries has been recognized by many researchers. Reviewed literature recognizes their contribution to the creation of jobs as well as poverty alleviation in many developing countries. Contractor development aims to boost delivery capacity and capability, as well as sustainability of emerging contractors who constitute an estimated 80% of CIDB registered contractors (CIDB, 2015). Contractor development is therefore a deliberate Government policy to implement strategies aimed at the empowerment of the emerging sector (National Contractor Development Framework).

The Department of Public Works (DPW) has been actively involved in conceptualizing and implementing programmes to promote the sustainability and growth of emerging contractors in the built environment. Furthermore, the Department of Human Settlements has developed a framework for emerging contractor support that has resulted in a programme that focuses initially on the training and development of emerging contractors (DoHS, 2014/15).

The South African government has put in place numerous resources ranging from enabling legislative laws and regulations to the funding of development programmes to assist and support the development of emerging contractors. Contractor development aims to create opportunities for emerging contractors to build capacity, capability and sustainability in order to play a meaningful role in infrastructure development. It also promotes empowerment to redress historical imbalances (CIDB, 2015).

According to CIDB (2011), the contractor development programme aims to develop key contracting competencies, which include the following:

(a) Improve the grading status of contractors in targeted categories and grades;

(b) Increase the number of black women, disabled and youth-owned companies in targeted categories;

(c) Create sustainable contracting enterprises by enabling continuous work through a competitive process;

(d) Improve the performance of contractors in terms of quality, employment practices, skills development, safety, health and the environment; and

(e) Improve the business management and technical skills of these contractors.

2.6 Low-cost Houses in other Developing Countries

Improving the living environment for households has been many a government's policy for many years. The right of access to adequate housing is one of the most important of all basic human rights and is globally recognised by different human rights instruments. Housing is a 'human right'; no state can disregard this important right of its citizens.

Most developing countries of the world are experiencing large-scale migration from rural to urban areas (Shackleton, *et al.* 2014). With rapid urban growth, an increasing number of people moved to the city and as the result, urban areas became crowded. Subsequently, increased housing needs have been experienced by many developing countries. Housing is one of the basic needs of human living, of the same importance as the food. It provides privacy and a secure place for people to live in. Human development is always interlinked to urban development (Lin and Yi, 2011). This is confirmed by (Byrne and Diamond, 2007) who posit that, housing development is the sign of urban development because housing is needed for the social and economic development of everyone.

When developing countries become more populated, the housing demand will automatically increase in the cities. Subsequently, challenges relating to housing demands versus housing supply will be experienced by many countries. In most of these cases, low income households suffer the most as they have no means of entering the housing market. If the homeless household's status gets worse and are unattended, the stability of urban development cannot continue (Lin and Yi, 2011). In

order to maintain urban stability and sustainable growth, the state has to make some measures to help low-income households to enter the housing market.

Both developing and developed countries have developed various types of public housing systems to assist low-income households. However, numerous challenges have been experienced during the housing development process, from housing policies; finances, land acquisitions, long waiting beneficiary queues; complicated application processes; etc.

This section of the study analyses housing needs for low income households in developing countries. The study will look at the case of Singapore and Malaysia in comparison to South Africa.

2.6.1 Singapore Housing Strategies and Policies

2.6.1.1 History and Background

Singapore is a newly industrialized country with the famous nickname of 'garden city'. Singapore's public housing begun in the 1930's. The Singapore Improvement Trust (SIT) was formed to carry out the country's housing duties. The SIT was, however, not given the authority to carry out large-scale housing construction. As a result, during its 32 years in existence, it only completed 23,000 units of flats, which equated to 8.8% of Singapore's 1.6 million people. Large numbers of people still lived in continually deteriorating overcrowded slums and squatter areas, with virtually no service facilities. It was estimated that in 1959, around 250,000 people were living in dilapidated pre-war housing in the urban area and around 300,000 were living in shanty huts in other congested squatter areas (Lin and Yi, 2011).

In 1959, in its election campaign, the People's Action Party (PAP) recognised that housing required urgent attention and pledged that it would provide low-cost housing for the poor if it was elected. When it won the elections and formed the newly elected government, it took immediate action to solve the housing shortages in the country. Government had committed to fulfilling its election promise to construct 10,000 units of low-cost housing annually in its first five-year programme. This was the situation that the Singapore government inherited when it came into power in 1959.

2.6.1.2 Housing Policies

Due to the extreme scarcity of land in Singapore, the price of land rises very quickly. To allow the authorities to acquire land quickly and cheaply for public-housing purposes, various legislation was passed, regulating compulsory land acquisition. Compulsory land acquisition has been the most effective way of obtaining land for public development. The Land Acquisition Act also establishes resettlement policies which enable large areas of squatter land to be cleared and for the squatters to be rehoused in low-cost flats. This has given the squatter population a chance to enjoy better housing and living standards.

The Land Acquisition Act had been criticised by some quarters as being an affront to the concept of justice. The forced clearance of squatters and slums and the relocation of households and families sometimes met with considerable resistance due to the hardships experienced by those people.

2.6.1.3 Public Housing in Singapore

On 1 February 1960, the Housing and Development Board (HDB) was established and took over from SIT to carry out the housing task. At its inception, the main objective of the HDB was to meet the serious housing shortage at that time. Its key functions have changed and evolved over the years and can now be said to be to provide lower-income and middle-income housing and related facilities, and to provide estate management services. The HDB has been given extensive powers with respect to land acquisition, resettlement, town planning, architectural design, engineering work and building-material production.

The majority of the residential housing in Singapore is publicly governed and developed. There is a large variety of flat types and layouts which cater to various housing budgets. HBD flats were primarily built to provide affordable housing for the poor and their purchase can be centrally aided by the CPF. Due to changing demands, there were more up-market public housing developments in recent years.

A Central Provident Fund (CPF) was set up in 1955 by the colonial government and it was introduced for working Singaporeans and permanent residents as a compulsory saving plan to fund their retirement, healthcare and housing needs. CPF was created

as a compulsory means for Singaporeans to pay for public housing. Both employers and employees contribute a certain percentage of the employee's monthly salary to the fund. Compulsory land acquisition has allowed the HDB to acquire land at lower prices. Cost-cutting and cost-effective measures also contribute towards low-priced housing units.

The Public Housing Scheme of Singapore is one of the most successful examples of affordable housing production in the world. More and more countries are trying to learn from the Singapore' public housing scheme experience in solving the housing development problems. However, the public housing delivery in Singapore has not been all smooth sailing. The country faced challenges of an extreme shortage of land. Nearly half of the available land in Singapore is already built up, while a considerable proportion consists of land designated as water catchment areas, forest reserves and for military establishments, which can never be put to economic use. The HDB built more than half a million units of public housing from 1960 to 1990. As a result, 85% of Singaporeans now live in public housing estates; 90% of whom own the 99-year leases on their subsidised homes. In 1960, 1970 and 1980, this ownership figure was at 9%, 36% and 74% respectively. This figure had climbed tremendously by 1980, due to the overwhelming public response to the liberalisation of CPF funds for the purchase of public housing. Rapid construction relieved the tremendous demand for low-cost housing. This massive housing programme generated much-needed employment and economic activity during the early 1960s.

2.6.1.4 Housing Subsidies

Singapore's government subsidies for public housing are meant to keep the cost and price of housing units well below the market rate. The HDB's annual deficit is fully subsidised by government expenditure grants provided from the government's current budget.

2.6.1.5 Home Ownership

It has been the government's objective to increase ownership of public housing to achieve a fully home-owning society by the end of the century. As a result, housing

policy has encouraged public housing tenants to become home owners instead. Initially, the HDB's policy was to only provide rental units.

Since 1964, the Singapore government has introduced the Home ownership for the People Scheme to help the group of low-income people to rent or purchase a public house for their family. Four years later, the government allowed people to use their CPF to be the down payment as part of their housing purchasing fee. More and more people in Singapore own their houses, since owning a house was not a difficult thing for them.

The Home Ownership Scheme became the overarching framework within which more detailed housing schemes, policies and procedures were formed. It aims to provide public housing for the large proportion of the population that private housing fails to house. This Scheme marked the decline of the rental proportion of public housing over the years. The Housing and Development Act under which the HDB operates, provides that a home owner of public housing cannot be deprived of this property even in the event of bankruptcy.

2.6.1.6 Beneficiary Qualification

Purchasers of public housing, however, have to satisfy certain eligibility conditions laid down by the HDB. Such conditions include Singapore citizenship, non-ownership of any other property, owner-occupancy, a minimum family size of two, and household incomes that fall below the income ceilings set by the HDB. These eligibility rules were very stringent in the 1960s and 70s, but were gradually relaxed once most of the population had been adequately housed.

2.6.2 Malaysia Housing Strategies and Policies

Malaysia is a middle-income developing country, attempting high income status by 2020. It has a population of about 31 million, growing at a rate of 1.44% per annum (CIAWFB, 2015).

2.8.2.1 Low-cost Housing in Malaysia

Government of Malaysia has introduced low-cost housing schemes to tackle the squatter problems of citizens from lower income as they do not afford to have their own house (Roslan, *et al.* 2013). In Malaysia, housing is divided into 4 categories: low-cost housing; low-middle cost housing; medium-cost housing and high cost housing. Demand and supply is the country's main challenge as it is one catalyst for social economic structures (Zainun and Ismael, 2015). Malaysia gained its independence in 1957 and in the same year, it started with public housing processes. Since Malaysia's independence, the housing demand has gradually grown due to the increasing migration population from rural areas and foreign workers (Zainun and Ismael, 2015).

Not too many middle-class Malaysians can afford owning their own houses as the property prices are very high. The Malaysian government introduced the My First Home Loan Scheme (MFHLS) in its effort to assist the lower to middle income class to buy homes. According to this scheme, people who earn less than RM 5,000 per month or below can apply for a 100% bank loan for a house, instead of paying the 10% down payment.

Despite the Malaysian government's commitments and efforts in providing adequate, affordable and quality houses for all income groups with emphasis on the development of low-and low medium cost houses, the housing sector was still challenged (Mohit, *et al.* 2010). The identified problems are: the numbers of housing provided do not meet the demands of the low-income group and the type of housing has not been satisfactory to family housing needs, comfort, social, cultural and religious needs (Mohit, *et al,.* 2010). This statement is supported by Roslan, *et al.* (2013) in saying the demand of low cost housing has been higher than the available number of houses.

2.6.2.2 Malaysian Housing Policy

The main drive of the Malaysian National Housing Policy is to provide accessible, adequate, affordable and quality housing for all its citizens, particularly the low income group. It aims to ensure equality in housing consumption through proper regulations. The housing policy of Malaysia is in line with the government agenda of "Adequate shelter for all".

The policy allowed the government to control the housing prices. However, the poor still could not afford to own houses (Siwar and Yusuf, 1997). This resulted in the high rise of squatter settlements (Malpezzi and Mayo, 1997). The national policies began to prioritize low-cost housing and undertook several measures to accelerate the implementation of the related housing programs.

2.6.2.3 Role of the Public Sector

The role of the Malaysian Public Sector is to provide affordable housing for the poor, soft housing loans are offered to encourage home ownership for low-income groups. The government is increasing its role to build more houses for sale at subsidized price in order to increase private sector efforts. The government also introduced the New Economic Policy (NEP) in 1971, as well as other economic factors in rural areas which resulted in rapid migration of the rural population to urban areas. NEP aimed at raising the national unity and nation building through the eradication of poverty.

Malpezzi and Mayo (1997) stated that the single highest housing production in Malaysia was initiated under the Public Housing Programme. In 1986, the Public Low Cost Housing Program (PLCHP) was introduced to improve housing shortages (Malpezzi and Mayo, 1997).

After the PLCHP was regarded as a failure, a new initiative was introduced, known as the Special Low Cost Housing Programme (SLCHP). The SLCHP's objective was to increase the economy and to increase the supply of houses in low and middle income households (Malpezzi and Mayo, 1997). Although the SLCHP increased the number of houses supplied, actual delivery progress was slow relative to the plans.

The SLCHP also encountered some challenges. The main challenge was the way in which the programme was implemented, not the programme itself. Inappropriate pricing of houses, location of houses and design typologies highly affected the housing demand (Malpezzi and Mayo, 1997). These problems did not appeal to the private sector and, consequently, all responsibility for achieving housing targets was placed on the public sector.

2.6.2.4 Role of the Private Sector

During Malaysia's fourth plan of housing the poor, government enhanced the appeal of low-cost housing to the private sector by calling for the private sector to reserve 30% to 50% of its financing for housing development (Shuid, 2004). In the process of attracting the participation of the private sector, the government introduced new incentives that included reduction in infrastructure standards and increased the speed for land conversions and other regulatory matters.

The government, through policy, prescribed the number of houses that the private sector had to build. The role of the state was reduced to the regulation of activities of private development to ensure that a certain proportion of their house building was constructed at costs that were affordable to low-income groups. The government assisted the private sector through certain instruments to keep the cost of houses down (Malpezzi and Mayo, 1997).

Despite the government's initiatives to increase the involvement of the private sector, the housing sector still faced some challenges. Complaints by the private sector included the slow processing and approval of applications. These contributed to delays of more than two years before a final decision was made. Price increases of raw materials affected the ability of development to maintain the prices of houses and many of the houses that were built were located beyond the reach of the poor target population.

2.6.3 Analysis of South Africa, Singapore and Malaysia

Developing countries have learned that the provision of decent housing for all cannot be left to the play of market forces alone (Shuid, 2004). Therefore, the governments of developing countries found it necessary to intervene in the production of housing for their population (Shuid, 2004).

In both developing and developed countries, housing the urban poor in suitable conditions is an uphill battle. The pace of urbanisation; the rate of economic growth; the availability of land for housing; the increase in land prices; and inappropriate strategies for urban planning and land appropriation all directly contribute to this problem (Shuid, 2004). Most governments have attempted to implement housing

programmes in order to house their urban poor. It is indicative from the literature reviewed that there is no secretive, easy solution that can address shelter problems faced by low-income families in developing economies. Conditions vary extensively and policies should be designed to address local conditions.

Singapore is one of the few countries in the world that have successfully introduced and implemented a large-scale public housing programme. Singapore has been able to implement city-planning and urban-management policies that actually benefit the poor. Its housing programme has been successful and admired for producing low-cost, affordable housing on a bulk scale. All public housing built by the HDB is in the form of high-rise flats in order to provide quality living conditions with large dwelling space as can be afforded, and given the high population density of Singapore. The quality of housing and living environment in Singapore has been favourably compared to the situation in other urban centres in Asia and beyond the region. An awesome majority of Singaporeans are housed in public housing and, mostly the beneficiaries enjoy ownership. The average Singaporean has been able to enjoy better housing than that enjoyed in some developed countries.

Malaysia has achieved a measure of success in its efforts to provide shelter for all and sustainable urban environment. This was made possible by the joint efforts of all concerned – government, local authorities, financial institutions, the private sector and the target group themselves. They have gone a long way in their housing development plan. The participation of the private and public sector have made housing for the people realistic.

Housing shortages are common in all three countries: South Africa, Singapore and Malaysia. The three studied countries have indicated full commitment to ensuring their citizens have access to adequate and affordable housing. They have complete policy system to protect the living right of their low-income groups.

In these countries, government interventions have managed to reduce the burden. The benefits of improved quality will ensure that all housing, regardless of cost, should meet some basic standards of livability. The lack of appropriate planning and land policies hinders any attempts to effectively shelter the poor. Besides the implementation of the housing programmes, countries like South Africa are still faced with huge housing challenges.

2.7 Chapter Summary

Housing challenges are a worldwide concern. In order to achieve government plans in providing quality and affordable houses for all, is something that needs to be done at the implementation level. Low-cost houses require extensive attention since they benefit a wide range of the country's population. The literature reviewed indicates that the concerns relating to the quality of low-cost houses in South African is still a challenge. The rate of poor quality in low-cost houses has been clearly indicated through a National Rectification programme. The identified defects in low-cost houses range from minor to moderate to major structural defects. The issues of quality are not isolated in South Africa. There are also other underlying issue like policy implementation, involvement of the private sector and the development of emerging contractors.

Beside all the challenges, South Africa has demonstrated great strides in housing a remarkable number of its needy citizens. However, much remains to be done to overcome the poor quality of low-cost housing.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The purpose of this chapter is to discuss the theoretical assumptions, research designs and methods fundamental to investigate factors required to improve the quality of low-cost houses in the eThekwini Municipality, KwaZulu Natal Province.

The first section of this chapter is an introduction that outlines the research questions that the study aims to answer. The research questions are important determinants of the research design and data collection methods used; hence they are briefly indicated in this section. Furthermore, this section reviews different data methods, research strategies and data collection techniques in order to allow for an informed selection for this study.

Saunders, *et al.* (2012) defines research design as the general plan mapping out details of how research questions will be answered. Questionnaires are known to be the important determinants of the research design and data collection methods used. This study aims to answer the questions listed below:

(a) What are the major contributors to poor quality in construction of low-cost houses as perceived by the project managers and emerging contractors in eThekwini Municipality, KZN?

(b) What are the influences required to enhance the quality of low-cost houses?

(c) What are the existing quality management mechanisms employed in the construction of low-cost houses?

Chapter 2 of this research report provided a background study and comprehensively reviewed current literature on topics related to the research questions stated above. Having reviewed existing literature, sufficient background was provided for the conclusion on research design, methodology and execution of the research.

Overall, the purpose of the research design and methodology is to enable the smooth sailing of different research processes, thereby making the research as effective as possible, yielding maximal information within minimal expenditure of effort, time and money (Kothari, 2009).

3.2 Research Method

Research methodology defines the rationale for the application of particular processes to identify, select and analyse information applied to understanding the research problem (Welman, *et al.* 2005). Furthermore, according to Welman, *et al.* (2005) the methodological section of a research study aims to answer the following questions: How was the data collected? and How was it analysed? Research methods are generalized and established ways of approaching research questions.

There are three main methodological choices to research studies, namely qualitative, quantitative and mixed methods. The primary methodological choice to be made when deciding on a research design is to determine whether the research will be quantitative or qualitative or mixed methods (the combination of both quantitative and qualitative). None of these methods is fundamentally better than the other and not all methods can be applied to all research questions. The appropriateness of these methods is decided by a number of different factors, including the type, purpose and general framework of the study. In fact, these methods can be used alternatively to the other or as a combination.

Although the definitions distinguish the two methods, in reality many business and management research designs are likely to use a combination of both methods (Saunders, *et al*. 2012).

The different research methods are discussed in item 3.2.1 below.

3.2.1 Qualitative, Quantitative and Mixed Methods

(a) Qualitative Methods

A qualitative method is a synonym for any data collection technique or data analysis procedure that generates or uses non-numerical data (Saunders, *et al.* 2016). It is

‘subjective’ in nature (Naoum, 2007). According to Leedy (2014), qualitative research methods serve one or more of the following purposes:

- Description - They can reveal the multifaceted nature of certain situations, settings, processes, relationships, systems or people;
- Interpretation – They enable the researcher to gain new insights about a particular phenomenon; develop new concepts and discover problems that exist within the phenomenon.
- Verification – They allow the researcher to test the validity of certain assumptions, claims, theories or generalizations within real-world contexts; and
- Evaluation – They provide means through which a researcher can judge the effectiveness of particular processes.

Qualitative methods possess the following characteristics:

- Open-ended questions
- Interview data, observation data, document data and video-visual data
- Text and image analysis
- Theme, pattern interpretation

(b) Quantitative Methods

A quantitative method is an enquiry into social or human problems based on testing a hypothesis or theory composed of variables, measured within numbers and analysed with statistical procedures in order to determine whether the hypothesis or theory holds true (Naoum, 2007). This is confirmed by Welman (2007) who states that quantitative research method is based on the measurement of quantity or amount. Quantitative research is generally ‘objective’ in nature (Naoum, 2007). The data collection technique used for quantitative methods is usually the survey strategy through questionnaires or interviews (Saunders, *et al.* 2016).

The quantitative method possesses the following characteristics:

- Pre-determined Instrumental based questions;
- Performance data, attitude data, observational data and census data; and
- Statistical analysis and interpretation

(c) Mixed Method

The mixed method is a branch of multiple research methods that combines the use of qualitative and quantitative data collection techniques and analytical procedures (Saunders, *et al.* 2016). It allows the researcher to advantageously make use of the different characteristics these two methods possess.

The mixed method possesses the following characteristics:

- Both pre- determined and emerged methods;
- Both open and closed ended questions;
- Multiple forms of data, drawing on all possibilities;
- Statistical and text analysis; and
- Across database interpretation.

3.2.2 Research Method Selection

Based on the type, purpose and framework of this research study, Mixed Methods will be the most suitable and will be employed for this study. The advantage of the mixed methods is that it combines the use of qualitative and quantitative data collection techniques and analytical procedures. The qualitative part will enable investigations into an understanding of the personal experiences and opinions of participants regarding the quality improvements of low-cost houses. The quantitative part will enable the achievement of certain statistical outcomes relating to the study. The mixed method allows the researcher to advantageously make use of the different characteristics these two methods possess. Hence it is employed for this study.

3.3 Research Design

According to Saunders, *et al.* (2016), research is something that people undertake in order to find out things in a systematic way, thereby increasing their knowledge. Another definition of research by Leedy (2014) states that it is a systematic process of collecting, analysing and interpreting information in order to increase understanding of a phenomenon about which one is interested or concerned. Research projects vary in

complexity and duration, and can be categorized by different distinctive characteristics (Leedy, 2014).

The research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data (Kothari, 2009). Leedy (2014) states that research design is a general strategy for solving a research problem. It refers to the overall strategy that one chooses to integrate the different components of the study in a coherent and logic manner, thereby ensuring that the research problem will be effectively addressed. This is affirmed by Welman, *et al.* (2005) who state that research design is the plan according to which the research participants are obtained and the collection of information from them.

From the preceding descriptions, it can then be concluded that research design is the complete plan for linking the conceptual research to the pertinent practical research. Research design clearly pronounces what data will be essential; what methods will be appropriate to collect and analyse data; and ultimately how the research question(s) will be answered. Abowitz and Toole (2009) state that the researcher has to decide on the methodological approach in an attempt to find solutions or answers to the research problem or question in order to accomplish the research objectives.

Saunders, *et al.* (2016) categorized the different research designs as follows:

Research design in the case of exploratory studies (Exploration Studies)

Exploratory research designs are also termed formative research studies. Its objective is to diagnose the situation, screen alternatives and discover new ideas. The major emphasis in such studies is on the discovery of ideas and insights (Kothari, 2009). Exploration studies are used when one has a limited amount of knowledge about the topic and gives major emphasis on the discovery of ideas and insights. These studies require a high degree of flexibility in order to afford opportunities for the consideration of different aspects of the research problem under study.

Research design in the case of descriptive and diagnostic research studies (Descriptive studies)

This research design is concerned with describing the characteristics of a particular individual or a group (Saunders, *et al.* 2016). It is a more structured design which aims

to provide an accurate and valid representation of the elements relevant to the research question. Studies concerning whether certain variables are associated are examples of diagnostic research studies.

Research design in the case of hypothesis-testing research (Experimental studies)

Experimental design research studies are those where the researcher tests the hypothesis of causal relationships between variables. This design type requires procedures that will not only reduce bias and increase reliability, but will permit drawing conclusions about causality. Usually experiments meet this requirement. Hence, when one talks of research design in such studies, it often means the design of experiments.

3.3.1 Research Design Selection

Subsequent to the above description of different research design options, the researcher has to decide on the approach to employ in order to try to find solutions or answers to the research problem or questions in order to achieve the research objectives. Since this study aims to diagnose the situation, screen alternatives and discover new ideas, the design approach employed is Exploratory which is informed by the pragmatism philosophy. The study is exploratory because it explored the factors contributing to factors required to improve the quality of low-cost houses in eThekwini municipality, KwaZulu Natal.

3.4 Research Strategies

A strategy is a plan of action to achieve a goal (Saunders, *et al.* 2016). Subsequently, research strategy is a plan of how a researcher will go about answering the research questions (Saunders, *et al.* 2016). It is the methodological link between philosophy and the subsequent choice of methods to collect and analyse data (Denzin and Lincoln, 2011). The choice of research strategy is therefore guided by the research question(s) and objectives; the coherence with which these link to the philosophy;

research approach and purpose; and also more pragmatic concerns including the extent of existing knowledge, the amount of time and other resources available and access to potential participants and to other sources of data (Saunders, *et al.* 2016).

There are different research strategies available that can be employed in different studies, namely: surveys, case studies, experiments, archival and documentary research, ethnography, action research, grounded theory and narrative inquiry.

These different strategies are discussed below and the selection of the appropriate strategy is justified.

(a) Surveys

A survey strategy is frequently used in business and management research. It is used to answer the 'what', 'who', 'where', 'how much' and 'how many' questions (Saunders, *et.al,* 2016). It is commonly used for exploratory and descriptive research. Survey strategy is associated with different methods that can be used for collecting data, the most popular being questionnaires as they allow collection from a sizeable population in a highly economical way, allowing easy comparison (Saunders, *et al.* 2016). This is affirmed by Naoum (2007) who states that surveys are recommended when one is gathering data from a relatively large number of respondents within a limited time frame. The survey strategies have different types of data collection techniques which include, but are not limited to, interviews, questionnaires, semi- structured interviews and more. In a survey, the investigator examines those phenomena which exist in the universe independent of his action.

(b) Experiment

According to Saunders, *et.al* (2016), an experiment is defined as "the study of probability of a change in an independent variable causing a change in another dependent variable". Kothari (2009) describes an experiment as an investigation in which a factor or variable under test is isolated and its effect(s) measured. Experiment strategy uses hypothesis rather than research questions to anticipate the relationship existence between variables. Two types of hypotheses are formulated in a standard experiment: a null hypothesis; predicts that there will be no relationship between

variables; and an alternative hypothesis, predicts that there may be a relationship between the variables (Saunders, *et.al* 2016). In an experiment, the investigator measures the effects of an experiment which he conducts intentionally.

(c) Case Study

According to Saunders, *et.al* (2016), a case study is an in-depth inquiry into a topic or phenomenon within its real-life setting. Naoum (2007) describes the case study approach as the researcher's intent to support his/ her argument by an in-depth analysis of a group of persons, an organization or a particular project.

The 'case' in case study research may refer to a person, a group, an organisation, an association, a change process or an event, as well as many other types of case subjects. The study of the case within its real-life setting or context helps to distinguish this research strategy from others. A case study has the capacity to generate insights from intensive and in-depth research into a study of a phenomenon in its real-life context, leading to rich, empirical descriptions and the development of theory. According to Saunders, *et al.* (2016), the case study strategy can also answer the questions 'why', 'what' and 'how'. It can be used as an explanatory or exploratory study using qualitative or quantitative methods. The data collection techniques used may include interviews, observation and questionnaires.

(d) Archival and Documentary Research

The archival research strategy is the digitalisation of data and the creation of online archives which can be employed in cases that make use of administrative records and documents as a main source of data. This strategy makes it possible for the researcher to access a huge variety of data from around the world. This type of strategy is not limited to recent data only, it also makes use of historical data. It allows for research questions that focus upon the past and changes over time (Saunders, *et al.* 2016). The documents used for research are considered secondary sources because they were originally created for a different purpose which therefore requires researchers to be sensitive to this fact (Saunders, *et al.* 2016).

(e) Ethnography

The ethnography research strategy is used to study culture or the social world of a group.

(f) Action Research

The action research strategy is an emergent and iterative process of inquiry that is designed to develop solutions to real organisational problems through a participative and co-operative approach, which uses different forms of information and which will have effects for participants and the organisation beyond the research project (Saunders *et al.* 2016). Its main purpose is to promote organisational learning in order to produce practical outcomes through identifying issues, planning action, taking action and evaluating action. It is about research in action not research about action (Saunders, *et al.* 2016).

(g) Grounded Theory

Grounded theory is a method of inquiry and the result of a research process. 'Grounded theory methodology' means the researcher's choice of this strategy as a way to conduct research. Then, the 'Grounded theory method' refers to the data collection techniques and analytic procedures that it uses.

Grounded theory is used to develop theoretical explanations of social interactions and processes in a wide range of contexts, including business and management. It provides a systematic approach to collect and analyse data.

(h) Narrative Inquiry

Saunders *et al.* (2016) define a narrative inquiry as an account of an experience that is told in a sequenced way, indicating a flow of related events that, taken together, are significant for the narrator and which convey meaning to the researcher. In a narrative inquiry, the participant is the narrator, with the researcher adopting the role of a listener facilitating the process of narration. Narrative inquiry seeks to present

chronological connections and the sequencing of events as told by the narrator in order to enrich understanding and aid analysis (Saunders, *et al.* 2016).

3.4.1 Research Strategy Selection

The applicable research design for this study is the exploratory design, which aims to ask questions in order to discover what is happening and also gain insights about the relevant ideas on improving the quality of low-cost houses. Therefore, the Survey research strategy will be the most suitable option to be employed for this research.

3.5 The Sample Size and Selection

3.5.1 Population

A research population is generally a large collection of individuals or objects that is the main focus of a systematic enquiry. This population is also known as a well-defined collection of individuals or objects known to have similar characteristics (Kothari, 2009).

In this study case, a target population entails the emerging contractors and project managers working in the low-cost housing industry.

3.5.2 Sampling Procedure

Samples can be either Probability or Non-probability samples. With probability samples each element has a known probability of being included in the sample. However, the non-probability samples do not allow the researcher to determine this probability. Probability samples are those based on simple random sampling, systematic sampling, stratified sampling and cluster/area sampling; whereas non-probability samples are those based on convenience sampling, judgement sampling and quota sampling techniques (Kothari, 2009). Sampling techniques are important as they enable the researcher to reduce the amount of data that needs to be collected by considering only data from the sub-group rather than all possible cases or elements (Saunders *et al.* 2016).

To save time and money on this study sample selections will be Probability sampling will be adopted. All individuals or objects within a certain population usually have a common, binding characteristic or trait

3.5.3 Sample Technique

Population commonly comprises of too many individuals to study conveniently, so a research study is often restricted to one or more samples drawn from it.

The sampling technique adopted for this study is a Probability – Simple Random technique. The sample will be divided into two categories: emerging contractors and housing officials form the eThekwini Municipality Housing Department and Provincial Department of Human Settlements. The emerging contractors sample was randomly selected from an established sampling frame that will represent the emerging contractors in eThekwini Municipality.

3.5.4 Sample Size

Due to the usually large sizes of populations, researchers often cannot test every individual in the population because it is too expensive and time-consuming. Simple-random technique is a method used to cull a smaller sample size from a larger population and use it to research and make generalization about the larger group (Christensen, *et al*.2011). It has an advantage of being able to accurately represent the larger group of population.

For this study, a sample size of forty (40) participants was targeted, which comprised thirty (30) emerging contractors within the eThekwini Municipality and ten (10) housing officials and five (5) from the Provincial Department of Human Settlements and five (5) from the EThekwini Municipality.

Table 3.1: Minimum sample size

Nature of the Study	Minimum sample size
Semi-structured/ In-depth interviews	5-25
Ethnographic	35-36
Grounded Theory	20-35
Considering a homogeneous population	4-12
Considering a heterogeneous population	12-30

Source; Saunders, et.al (2016)

3.6 Data Collection Procedure

Data collection begins after a research problem has been defined and the research design outlined (Kothari, 2009). The decision on the data collection technique to be used should consider the type of data to be collected. When selecting a data collection technique, the researcher should take into consideration the nature of investigation; objective and scope of the inquiry; financial resources; available time; and the desired degree of accuracy. The objective is to obtain an appropriate set of data which will allow the researcher to continue testing the research problem in the study area and to realise the objective as thoroughly as possible, given the dynamism of research and the practical considerations for outputs that are reasonably close to the original intentions (Fellows and Liu, 2008).

In an attempt to answer the research questions and meet the research objectives, this study will collect primary data. Primary data is the data which is collected afresh and for the first time. It has that original character in it. Primary data is an originally collected type of data.

This section will review the different data collection methods. The data collection techniques appropriate to this research are discussed and the selection technique justified.

3.6.1 Primary Data Collection

Primary data can be collected either through experiment or through surveys (Kothari, 2009). If the researcher conducts an experiment, he observes some quantitative

measurements or the data, with the help of which he examines the truth contained in his hypothesis. In the case of a survey, data can be collected by any one or more of the following ways:

(i) Observation: This method entails the collection of information by way of the researcher's own observation, without interviewing the participants. It is mostly concerned with what is currently happening, not past or future activities. This method can be very expensive, with very limited information and is not suitable for studies that involve large samples.

(ii) Personal interviews: The researcher follows a firm procedure and tries to find answers to pre-conceived questions through personal interviews. This method of collecting data is usually carried out in a structured way where, to a large extent, the answers depend upon the ability of the interviewer.

(iii) Telephone interviews: This method of collecting information involves contacting the respondents by means of a telephone. This is not a very popular method but it plays an important role in industrial surveys in developed regions, particularly when the survey has to be accomplished in a very limited time.

(iv) Questionnaires: A questionnaire is a research instrument that entails a series of questions for the purpose of gathering data (Fellow and Liu, 2003). The researcher and the respondents do come in contact with each other when this method of survey is adopted. Questionnaires are given to the respondents with a request to return after completing. It is the most extensively used method in various economic and business surveys. The questionnaire to be used must be carefully prepared to ensure effectiveness in collecting the relevant data.

(v) Schedules: In this method, enumerators are appointed and given training. They are provided with schedules containing relevant questions. These enumerators go to respondents with these schedules. Data is collected by filling up the schedules on the basis of replies given by respondents. Much

depends upon the capability of enumerators. Some occasional field checks on the work of the enumerators may ensure sincere work.

From the primary data collection techniques discussed earlier, questionnaires are the most suitable for this study as compared to using secondary document data. The researcher is of the view that document secondary data may not certainly match the essentials of this research study which aim to exploratory investigate the factors that will contribute to quality improvements of low-cost house. This research study is an exploratory study, conducted in order to determine the nature and better understanding of the research problem. Questionnaires will help to understand the in depth the respondent's attitudes, opinions and behaviour associated to the research study subject as compared to the document secondary data. Questionnaires will allow the respondents to provide any feedback they please and this gives the researcher an opportunity to gain insights on topics that were not previously thought of and can also indicate important trends and opinions for further research.

The item 3.6.1.1 below discusses in detail the questionnaires as the selected technique and justifies its appropriateness for this study.

3.6.1.1 Collecting Primary Data by Questionnaires

The selected strategy is the use of Surveys, mainly because it satisfies the 'what', 'who', 'how much' and 'how many' questions which are contained in this research. The data collection technique employed will be a questionnaire. The questionnaires will comprise two categories of questions; open-ended and closed ended questionnaires.

A questionnaire is a structured technique that is used as a primary data collection method, where each participant is requested to respond to the same given set of questions (Saunders, *et al.* 2016). This method of data collection is quite popular for descriptive or explanatory research studies. Questionnaires are better suited to be used for the method where relationships can be examined between variables.

Naoum (2007) states that the use of questionnaires is beneficial when compared to other techniques of data collection as it is affordable and does not require much effort

from the respondent. This is also confirmed by Kothari (2009) who states that there is low cost involved in questionnaires even when the universe is large and is widely spread geographically.

Some of the advantages of questionnaires, mentioned by Kothari (2009) are:

(i) It is free from the bias of the interviewer and answers are in the respondents' own words;
(ii) Respondents have adequate time to give well thought out answers;
(iii) Respondents, who are not easily approachable, can also be reached conveniently; and
(iv) Large samples can be made use of and thus the results can be made more dependable and reliable.
(v) Can be easily used to reveal peoples experiences, understandings and interpretations

Disadvantages of questionnaires

(i) The researcher may not have asked the right questions which allow new insight in the research topic.
(ii) Questions often only allow a limited choice of responses. If the right response is not among the choice of answers, the investigators will obtain little or no valid information.
(iii) The varying responses to questionnaires can also be a setback in using questionnaires

Questionnaires may not always be the best way to gather information but their capability of in-depth explorations and aim not only to determine attitudes and opinions but at identifying and classifying the logic of different sets of responses, at seeking patterns or commonly or divergence in responses and at exploring how they relate to concepts and processes (McGuirk and O'Neill, 2016), makes them suitable for this study.

In this method, a questionnaire is sent (by any means convenient) to the persons concerned, with a request to answer the questions and return the questionnaire. A questionnaire consists of a number of standardized typed or printed questions

prepared in a definite order on a form or set of forms. At receipt of the questionnaire the respondents are expected to read and understand the questions and answer the questions on their own, writing down answers in the space provided.

3.6.1.2 Questionnaire Design

The questionnaire design involves structuring the questionnaire into the types of questions to be put across in order to gather the required data. In order to ensure some logical flow of the questions and lessen the risk of the respondents getting confused and not answering all questions, the flow and layout of the questionnaire is critical and this was considered during the design. Subsequent to determining the general structure, the types of questions were considered and decided upon. The questions were designed to ensure that they include all significant aspects pertaining to the research study.

The questionnaire was designed to include both open-ended and closed-ended questions. Together with the questionnaire was a covering letter giving details of the research and the purpose of the questionnaire. The questionnaire was designed to be manually delivered to the participants in order to accommodate all participants.

3.7 Time Horizon

When deciding on a research design the researcher has to ask her/himself whether the research is going to be a ‘‘snapshot’’ taken at a particular time or whether it will be a series of snapshots representing a series of events taken over a given period: The two types of time horizon the researcher has to consider when designing the research are cross- sectional studies and longitudinal studies.

Cross-sectional studies are “snapshot” studies that are taken at a particular time. These are the studies that often employ a survey strategy. Longitudinal studies are those that require an extended period of time to complete compared to those conducted at a particular time. The main strength of longitudinal studies is in its capacity to study change and development.

Since this study will be conducted as a time constrained, once-off process, it will employ a survey strategy and a cross-sectional time horizon will be adopted.

3.8 Validity and Reliability

The validity of a measurement instrument is the extent to which the instrument measures what it is intended to measure (Leedy, 2014). According to Saunders *et al*. (2016), validity refers to the appropriateness of the measures used, accuracy of the analysis of the results and generalisability of the findings.

Reliability refers to replication and consistency (Saunders et al. 2016). Lee *et.al,.* (1999) also describes reliability as the consistency and stability of scores. This means using the same data in a different situation and attaining similar results. To attain reliability in this study, the researcher had to ensure that the deductions from the responses to the interviews are reflected clearly and that no room for ambiguity and assumptions is accommodated. The information from the literature review assisted in giving credibility to the research analysis and outcomes.

The validity and reliability of the data collection technique was taken into consideration to ensure that the data collected denoted a true reflection of the conditions of the low cost housing construction industry. Another important aspect considered in ensuring validity and reliability was that all questions were designed to be clear and precise in order to minimize misinterpretation and to ensure consistency.

Leedy (2014) state that the validity and reliability of measurement instruments influence the extent to which a researcher can learn something about the phenomenon under investigation; the probability that the researcher will obtain statistical significance in any data analysis; and the extent to which the researcher can draw meaningful conclusion from the data.

Given the context in which this study is initiated, the researcher is confident that the data gathered for this study is reliable and valid, despite the limitations experienced.

3.9 Ethical Considerations

To guarantee compliance to the ethical requirements of the Wits University's School of Construction Economics and Management, the research considered all ethical concerns that could possibly arise during this study. The moral integrity of the researcher during the research project is a significant aspect of ensuring that the processes used and the findings are trustworthy and valid.

For this study, ethical issues were considered within these four categories: Protection from harm, voluntary and informed participation; right to privacy; and honesty with professional colleagues. Ethical concerns were considered in all stages of the research project.

The questionnaires had a covering letter explaining what the purpose of the study is, as well as the rights of the participants during and after the research process. Consent forms were also issued to all participants, although many of them felt that signing the form will disclose their privacy. Obtained data were treated with high confidentiality and were kept safely after the analysis. An application for ethical approval was made to the Wits Ethics Committee and an Ethical Clearance Certificate was granted to the researcher.

3.10 Bias in the research study

Bias is a process where the scientist performing the research influences the results, in order to portray a certain outcome. Pannuci and Wilkins, 2006 also define bias as any tendency which prevents any prejudiced consideration of a question. In research, it occurs when a systematic error is introduced into sampling or testing by selecting or encouraging one outcome or answer over others (Sica, 2006). Bias can be influenced both by the researcher and the respondents. It can occur in any stage of the research, including study design, data collection, as well as in the data collection process.

At some point bias is nearly always present and can find its way into the program. To lessen the impact of bias the researcher has made considerations into the study design and implementation. The questions were thoughtful posed and delivered in a way that will allow the respondents to reveal their true opinions without distortions.

3.11 Chapter Summary

In this chapter, the research design, research methodology and research methods were outlined. Issues that informed the research methodology, explaining where the study originated, while also outlining the criteria required for a thorough methodology with regards to effectiveness were raised. The methods for data collection and analysis were discussed. Primary data collected by means of semi-structured questionnaires and secondary data was collected by document secondary data. Indications were also provided of the precautions taken to ensure the reliability and validity of information as well as ethical considerations.

CHAPTER 4

DATA COLLECTION, ANALYSIS AND DISCUSSION OF THE RESULTS

4.1 Introduction

The main purpose of this chapter is to present, analyse and discuss the data that was collected by means of semi-structured questionnaires. The first section of this chapter is an introduction that outlines the study area and details the sample selected as well as the manner in which the data was collected. The second section entails the presentation, analysis and discussion of the data collected.

4.2 Overview of eThekwini Municipality as a Study Area

eThekwini Municipality is located on the east coast of South Africa, in the province of KwaZulu-Natal (KZN). The Municipality spans an area of approximately 2 297km² and is home to some 3,5 million people. It consists of a diverse society which faces various social, economic, environmental and governance challenges.

The population of the metro, with reference to Census 2011, is 3 442 361. The population has grown by 1, 08 % from 2001 to 2011, against 2, 34% from 1996 to 2001 (Statistics South Africa, 2011). The 3.44 million people who reside within the municipal area consist of individuals from different ethnic backgrounds. The majority of the population come from the African community (73.8%), followed by the Indian community (16.7%), White community (6.6%), Colored community (2.5%) and other (0.4%) (Census, 2011).

4.3 eThekwini Municipality Human Settlements

The purpose of the eThekwini Department of Human Settlements is to facilitate and actively participate in housing delivery and the creation of sustainable human settlements in the eThekwini Municipal area, with a view to ensuring that all citizens of

Durban have access to a housing opportunity which includes secure tenure, basic services and support in achieving incremental housing improvement in living environments with requisite social, economic and physical infrastructure. The key elements of the department's contribution are the construction of new fully subsidized houses; the management and sale of rental and pre-1994 stock; the upgrade and refurbishment of housing units built by the state; and the development and conversion of community residential units.

The provision of adequate shelter for residents is a priority in the eThekwini Municipality. To date, the Municipality has delivered approximately 168 000 homes and is currently working on plans for delivering more houses in its various areas. However, the current backlog for housing provision stands at just over 404 000 (Municipal IDP, 2014/2015). The Municipality acknowledges that it will take many years to eradicate the housing backlog.

Key Issues relating to housing:

- High backlogs with limited funding available/unfunded mandates;
- A lack of well-located land; and
- Projects stalled due to delays experienced in land acquisition; a lack of well-located and suitable land; environmental and developmental approvals; and conflicting interests, especially with adjoining communities.

4.4 Primary data collection

Data for this study was collected by means of semi-structured questionnaires, which included both open-ended and closed-ended questions.

Participants were divided into two groups: (i) Low-cost housing project managers and (ii) Low-cost housing emerging contractors within the jurisdiction of eThekwini Municipality.

The questionnaires for both groups were hand delivered to participants and then participants were given time to complete the questionnaires at their own pace and submit as per the individually agreed method (i.e. by hand, scanned and emailed or

faxed). The hand delivery of the questionnaires to the participants was advantageous as the researcher managed to explain in person the purpose of the study and the process of data collection.

4.4.1 Data samples and distribution of questionnaires

A sample size of forty participants was planned, which targeted thirty emerging contractors and ten project managers.

A total of twenty seven responses were received and recorded, which represented a response rate of 67%. This positive response rate from the participants was attributed to constant reminders, numerous extensions of the response date, personal administration as well as personal collection where necessary.

Table 4.1: Questionnaire distribution

Distribution Groups	**Distributed Questionnaires**	**Returned Questionnaires**	**Not Returned Questionnaires**
Officials (DoHS provincial office and EThekwini Municipality	10	10	0
Contactors	30	17	13
Totals	**40 = (100%)**	**27 = (67.5%)**	**13**

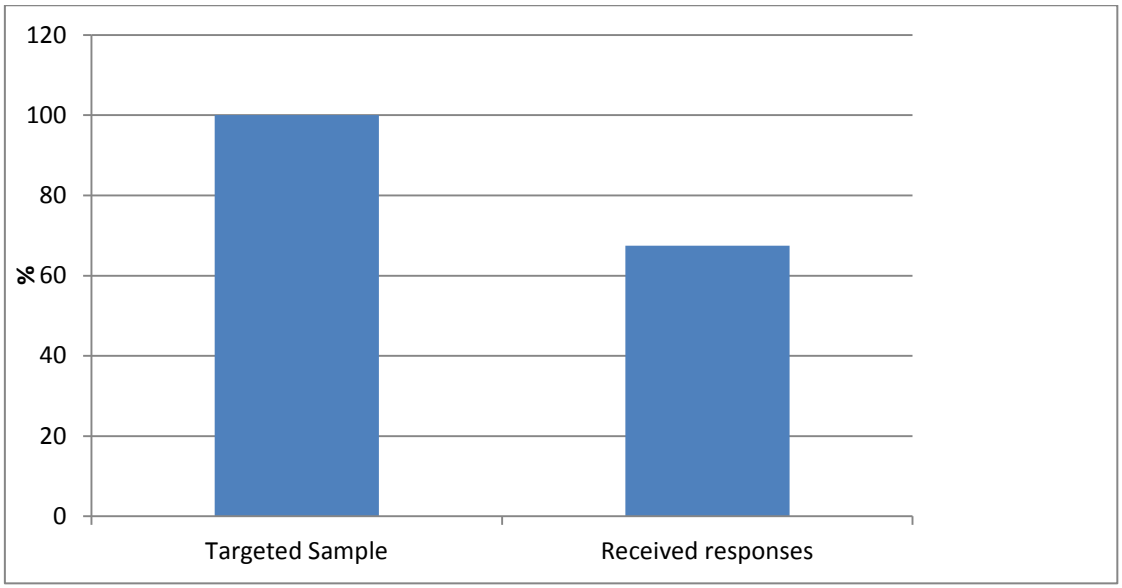


Figure 4.1: Participation rate

4.5 Data Presentation and Analysis

Data were obtained from semi-structured questionnaires, which comprised both open-ended and closed-ended questions. The aim of employing semi-structured questionnaires was to achieve effective answers that are more relevant to the topic and to allow the respondents to answer the same questions without limiting the manner in which they expressed their views and feelings about quality related issues of low-cost housing in eThekwini Municipality. The questionnaires were designed such that a total of twelve questions were similar to all participants in order to allow some comparison on perceptions and suggestions by the project managers and emerging contractor respondents. The only limitation to the comparison questions is that there were only ten project managers who responded as opposed to seventeen emerging contractor respondents.

The received responses were analysed using the Microsoft Excel software package. They were recorded and categorised such that similar reasons were grouped together and subsequently quantified. Data findings were described in association to the objectives that guided the study, which are as follows:

(a) To compare the contributing factors to the poor quality of low-cost houses as perceived by housing project managers and emerging contractors in eThekwini municipality.

(b) To compare key factors that can be improved to enhance the quality of low-cost houses as perceived by project managers and emerging contractors.
(c) To identify quality management mechanisms currently available in the construction of low-cost houses and determine their influential level.

Analysis of responses by mean of calculations was also used in some questions in order to establish the frequency of the response.

The mean per item is calculated using the following formula:

$$\frac{N1 + 2N2 + 3N3 + 4N4 + 5N5}{5 \times TR} \quad \text{Equation (1)}$$

Where: N1, 2N2, 3N3, 4N4, 5N5 = Weighted Score

TR = Total Responses

Section 1: Profiling of the participants

The first section of the questionnaire intended to describe the biographic variables of the respondents and to assess any influences on the collected data. According to (Oschman, *et al.* 2006), when a questionnaire is used as a method of data collection, it is important to pay attention to the biographical details of the respondents who complete the forms. Biographic details such as gender, age and number of service years must be taken into consideration as they give a picture of an individual's perspective when responding to the questionnaire. This information is imperative when analysing and interpreting data.

(a) Gender

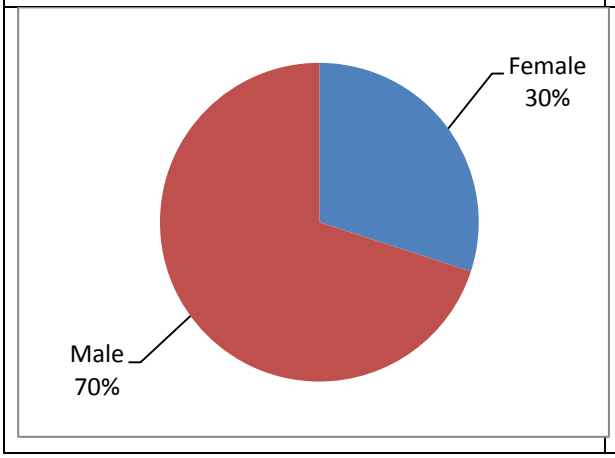
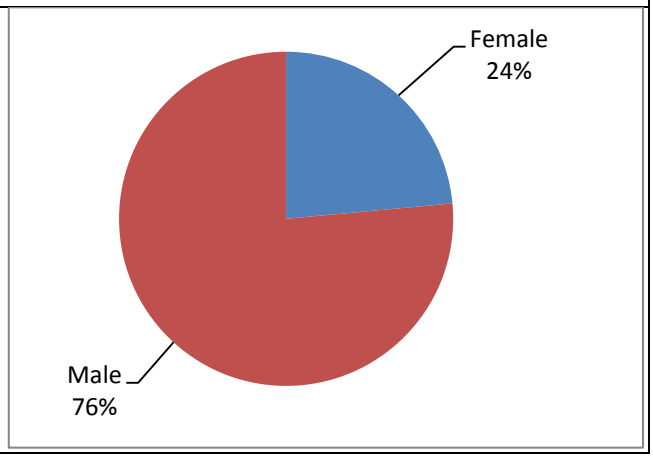
Ten (10) Project Managers	Seventeen (17) Emerging Contractors
	

Figure 4.2: Participants' Gender

The results presented in Figure 4.2 are an indication that there is a predominance of males as compared to females amongst the respondents. This then suggests that the composition of the construction industry is mainly dominated by males and still requires further transformation.

(b) Age Group

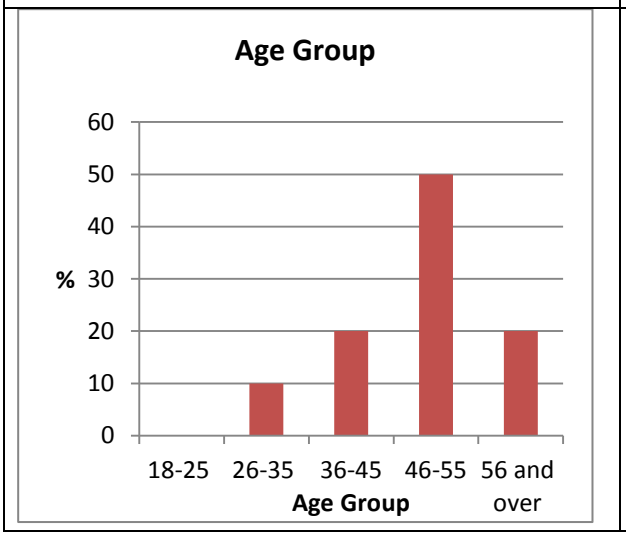
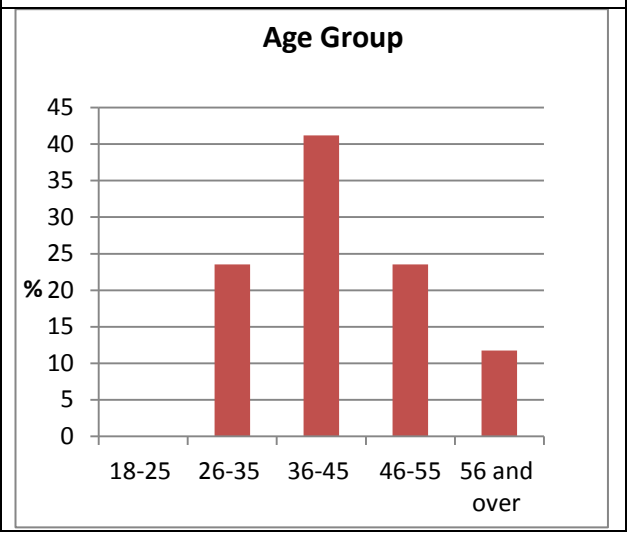
Ten (10) Project Managers	Seventeen (17) Emerging Contractors
	

Figure 4.3: Age group

The results presented in Figure 4.3 indicated that there is variety in the ages of the respondents and the majority fall within the age group of 36-55. Therefore, this data can be regarded as reliable as respondents were mature enough to answer the questions.

(c) Years of experience

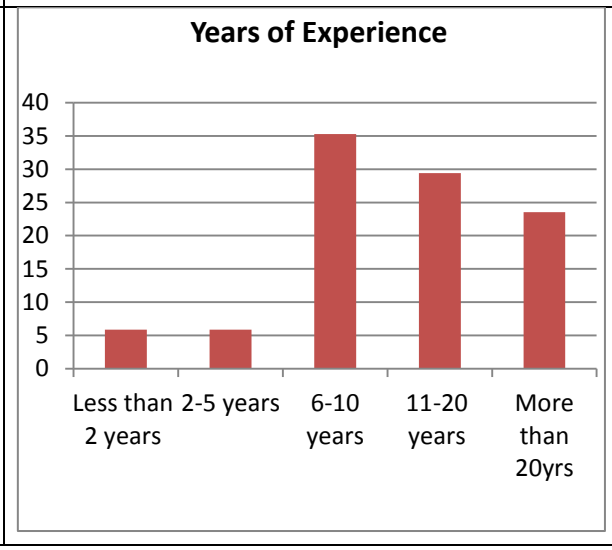
Ten (10) Project Managers	Seventeen (17) Emerging Contractors
	

Figure 4.4: Years of experience

Results presented if Figure 4.4 above indicate the distribution of the number of years of service amongst the respondents within the low-cost housing industry. From the analysis, the results indicated that respondents have relatively reasonable experience in the low-cost housing industry and their opinion in relation to the topic could be trusted. The level of experience of respondents is of great importance to the credibility and reliability of the entire study.

Selection of Emerging Contractors

At the time of defining the targeted sample for the emerging contractors, two important determinants were employed to select the sample. These determinants are (i) CIDB registration status and (ii) NHBRC Registration status. These biographic details for emerging contractors will give a picture of an individual's perspective when responding to the questionnaire. This information is imperative when analysing and interpreting data.

(d) CIDB Registration

The targeted samples for contractors for this study were those contractors registered with CIDB grades from 1 to 4. The purpose of this detail is to verify participant's registration without giving away confidential information.

All 17 (100%) respondents indicated that they were registered with CIDB and they were all within the required grades for the study. Details are presented in Table 4.2 below.

Table 4.2: CIDB Grade of the respondents

No of respondents (Total = 17)	CIDB Grade
3 = (18%)	3 GB, 2CE
7 = (41%)	3GB
7 = (41%)	2GB

(e) NHBRC Registration

In terms of the Housing Consumer Protection Measures Act 95 of 1998, it is a requirement that everyone who is involved in the business of home building should be registered with the NHBRC. The question then seeks to identify how compliant are the respondents to the requirements of this Act. Again, emerging contractors were asked to respond to this question without giving details of critical information that will jeopardise their confidentiality.

All seventeen (17) respondents indicated that they are actively registered with the NHBRC.

Section 2: Quality of low-cost houses in eThekwini Municipality: Perception of Project Managers and Emerging Contractors

The purpose of this section is to give an indication of how the respondents perceive the quality related issues in the construction of low-cost houses within the study area. This section sought to accomplish the first and second objectives of this study, which are to compare the contributing factors to poor quality of low-cost houses as perceived by the housing project managers and emerging contractors in eThekwini municipality and to compare key factors that can be improved to enhance the quality of low-cost houses as perceived by the project managers and emerging contractors. The section will cover, but is not limited to, the perceived quality of the low-cost houses in the

study area; contributing factors to poor quality of low-cost houses; factors that can contribute to improve the quality of low-cost houses; and the availability and effectiveness of quality frameworks within the low-cost housing industry.

Questionnaires were divided into comparison questions designed for both groups and individual questions designed for the contractors group only.

(a) Comparison Questions

Question 1: Do you have a dedicated person responsible for quality assurance in your company?

Project Managers	Emerging Contractors
100% Yes	16 Yes = 94% 1 No = 6%

The majority of respondents, over ninety percent for both groups, have indicated that there is a designated person responsible for quality assurance. These designated people are indicated to be project inspectors and are responsible for all quality related items in low-cost housing projects.

Question 2: What is the highest standard / qualification of the person responsible for quality assurance?

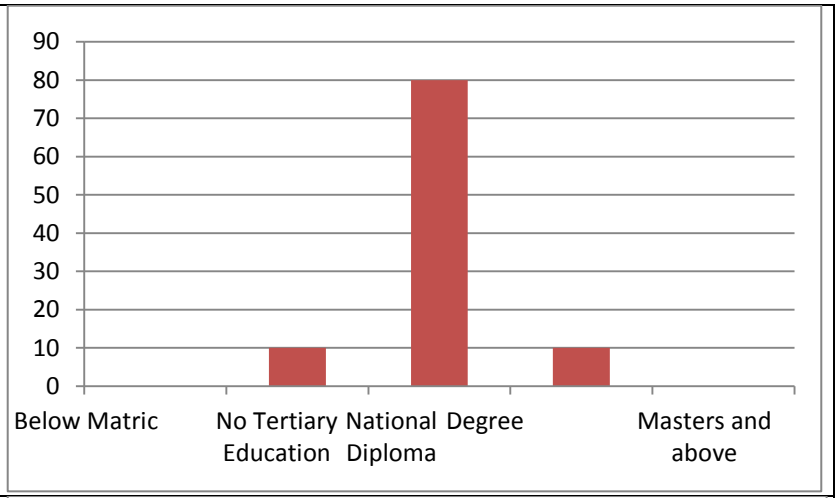
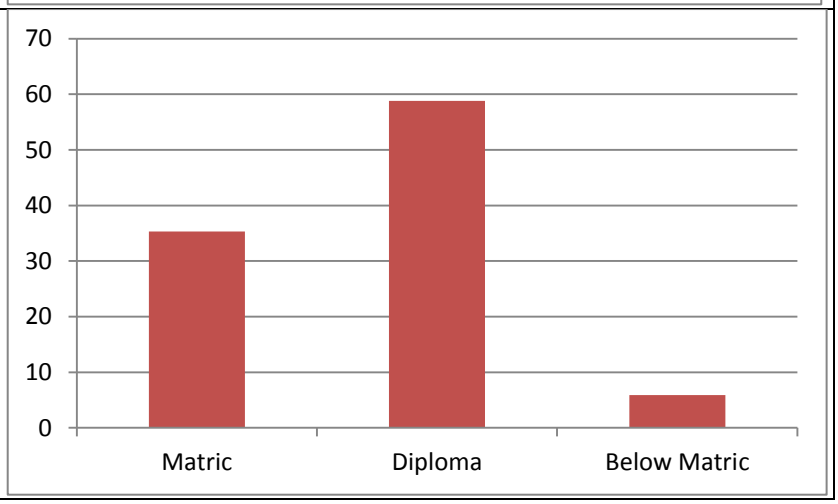
Ten (10) Project Managers	
Seventeen (17) Emerging Contractors	

Figure 4.5: Educational levels for quality assurers

The purpose of this question was to determine the educational levels of the individual responsible for quality assurance in order to ascertain if the level of education might have any influences on the poor quality. This question was described in relation to the first objective of the study, which aims to determine the contributing factors to the poor quality of low-cost houses as perceived by the housing project managers and emerging contractors in eThekwini Municipality. The question seeks to ascertain a connection between the standard of qualification and the poor quality of low-cost houses.

The educational levels as presented in Figure 4.5 above for both groups, a majority of over fifty percent of the respondents indicated that the individuals responsible for quality assurance possess a Diploma as their highest standard. This indicates that the

designated person for quality assurance is generally well qualified to understand all the requirements relating to the quality of low-cost houses.

Question 3: How would you describe a good quality house? (please tick an appropriate answer).

- House finishes (Aesthetics)
- Conformance to prescribed project specifications
- Conformance to structural and architectural requirements
- Satisfaction of the beneficiary expectations
- All of the above

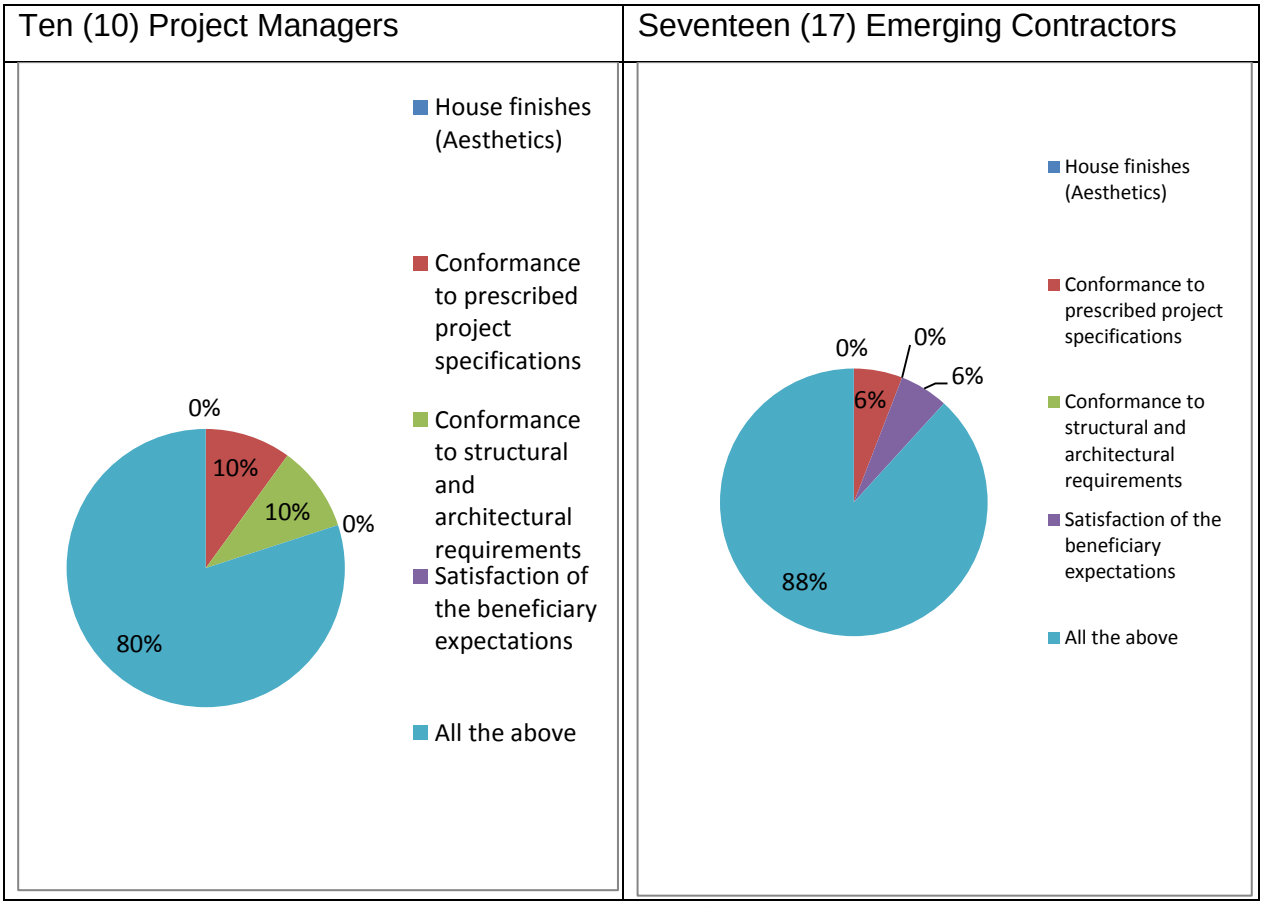


Figure 4.6: Low-cost house good quality description

This question aims to get the respondents' perception with regard to their description of good quality. This question relates to the third objective of this study, which sought to identify the quality management mechanisms currently available in the construction of low-cost houses and to determine if these mechanisms are adequate to ensure that good quality houses are produced.

From figure 4.6 above, for both groups a majority percentage of over eighty percent is in agreement that not only one item listed in this question would adequately describe good quality of a low-cost house. A combination of house finishes, conformance to prescribed project specifications, conformance to structural and architectural requirements and satisfaction of the beneficiary expectations are needed. This is attested to by (Oschman, *et al.* 2006) who describes quality as the degree to added value of products and/or service delivery as perceived by all stakeholders through conformance to specification and the degree to added excellence through a motivated workforce, to meeting customer satisfaction.

According to Best Practise in Quality Management (BPQM) (2007), a good quality house is a strong, durable and defect free house constructed by the correct usage and application of building materials.

Question 4: What is the standard of quality of low-cost houses delivered in the past 5 years at EThekwini Municipality? On a Likert scale of 1-5; N1 = 1, N2 = 2, N3=3, N4 = 4, N5= 5.

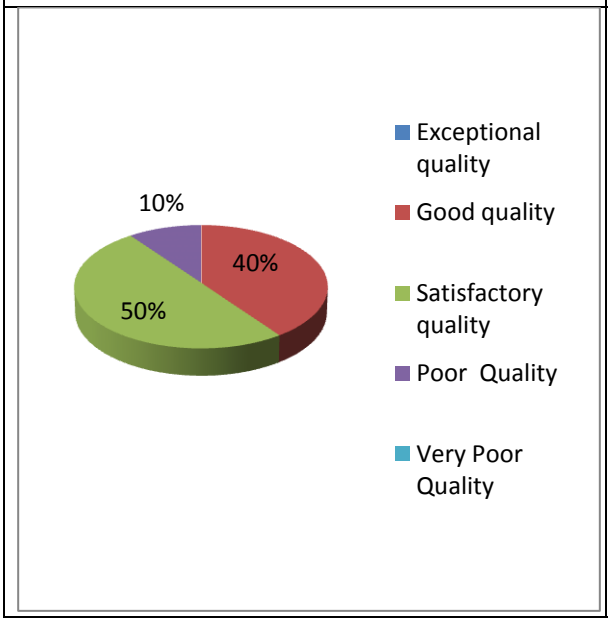
Ten (10) Project Managers	Seventeen (17) Emerging Contractors
	

Figure 4.7: Perception of quality of low-cost houses in eThekwini Municipality

The aim of this question is to give the respondents an opportunity to give their perception of the quality of the low-cost houses that were constructed in the past. The question relates to the first and second objectives of this study.

Figure 4.7 presents the responses by both groups. For both groups, the majority of respondents (over fifty percent) have rated the quality of the low-cost houses in eThekwini Municipality as of satisfactory quality. Satisfactory quality means that goods meet reasonable requirements or standards in terms of appearance, durability, fitness for use, safety and freedom from any defects.

Question 5: Could the following contribute to the poor quality of low cost houses?

The question aims to determine the level of agreement between the project managers and emerging contractors on factors that contribute to the poor quality of low-cost houses. The data under this question was described in relation to the first objective of the study, which sought to identify and compare contributing factors to poor quality as perceived by the project managers and the contractors within the study area.

Table 4.3(a) below presents the factors that contribute to the poor quality of low cost houses as indicated by the project managers.

Description	N1	N2	N3	N4	N5	Totals	Mean Scores
The emphasis on the empowerment of locally previous disadvantaged individuals contributes to poor quality delivery of houses.	0	1	1	6	2	10	
	0	2	3	24	10	39	0.78
Lack of training for contractors	0	1	2	5	2	10	
	0	2	6	20	10	38	0.76
Use of less experienced contractors in low cost housing construction	1	2	0	3	4	10	
	1	4	0	12	20	37	0.74
Lack of communication between housing stakeholders	1	1	1	6	1	10	
	1	2	3	24	5	35	0.7
Unclear project specifications	1	2	1	3	3	10	
	1	4	3	12	15	35	0.7
Lack of financial assistance for contractors	2	1	0	5	2	10	
	2	2	0	20	10	34	0.68
Use of poor materials	2	1	0	5	2	10	
	2	2	0	20	10	34	0.68

Political influences	0	3	1	5	1	10	
	0	6	3	20	5	34	0.68
Use of unskilled local labours during construction	3	0	1	4	2	10	
	3	0	3	16	10	32	0.64

Table 4.3(b) below also presents the factors that contribute to the poor quality of low cost houses as indicated by the emerging contractors.

Description	N1	N2	N3	N4	N5	Totals	Mean Score
Lack of training for contractors	0	1	1	4	11	17	
	0	2	3	16	55	76	0.89
Lack of financial assistance for contractors	1	0	1	4	11	17	
	1	0	3	16	55	75	0.88
Use of unskilled local labours during construction	0	2	0	5	10	17	
	0	4	0	20	50	74	0.87
Use of poor materials	1	1	0	7	8	17	
	1	2	0	28	40	71	0.84
Unclear project specifications	0	2	1	8	6	17	
	0	4	3	32	30	69	0.81
Use of less experienced contractors in low cost housing construction	2	1	0	5	9	17	
	2	2	0	20	45	69	0.81
Lack of communication between housing stakeholders	1	2	1	5	8	17	
	1	4	3	20	40	68	0.80
Political influences	1	3	0	5	8	17	
	1	6	0	20	40	67	0.79
The emphasis on the empowerment of locally previous disadvantaged individuals contributes to poor quality delivery of houses.	3	1	2	7	4	17	
	3	2	6	28	20	59	0.69

The factors presented in Tables 4.3 (a) and (b) are arranged in a descending order, with the high mean score factors being on top and least mean score factors at the bottom. From the analysis of the data by both project managers and emerging contractors, it is evident that the views are totally different. The results indicate that project managers are of the view that emphasis on the empowerment of local

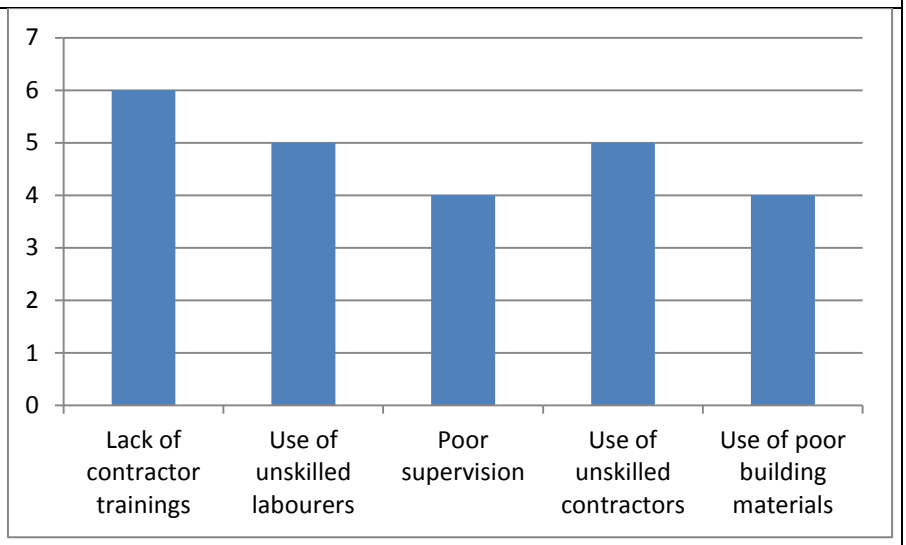
previously disadvantaged individuals contributes highly to the poor quality of low-cost houses. On the other hand, the emerging contractors believe that lack of training for contractors contributes highly to the poor quality of low-cost houses.

The data details presented in Tables 4.3 (a) and (b) are an indication that the view point of the project managers and those of the emerging contractors regarding the quality of low-cost houses are diverse. From the literature reviewed, it suggested that poor quality of low-cost houses could be as a result of several factors.

Question 6: What are other contributing factors to the poor quality of low-cost houses?

Seventeen (17) Emerging Contractors

1. Lack of contractor trainings
2. Use of unskilled labourers
3. Use of unskilled contractors
4. Poor supervision
5. Use of poor building materials



Ten (10) Project Managers

1. Use of emerging contractors
2. Poor building materials
3. Lack of sufficient funding
4. Use of unskilled labourers
5. Lack of on-site training for labourers

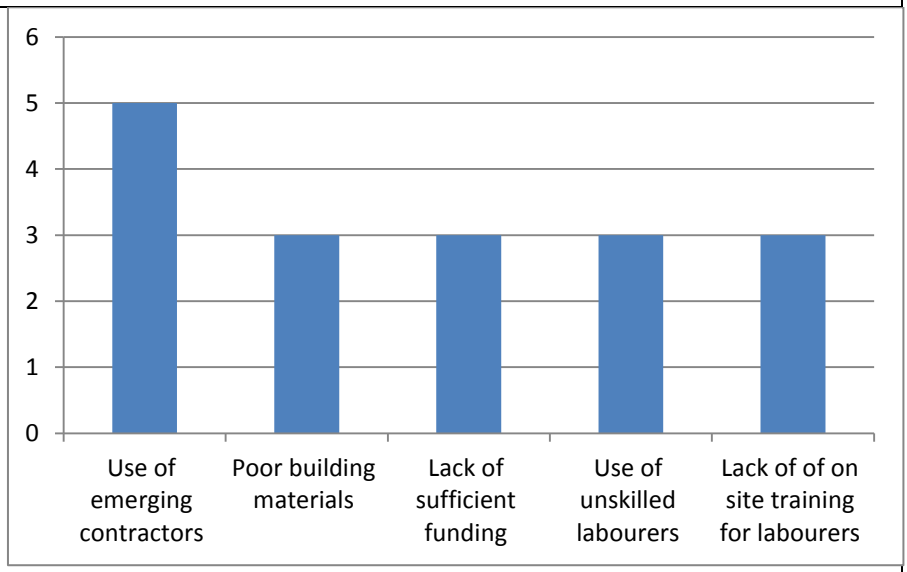


Figure 4.8: Other contributing factors

The participants were asked to reveal what they thought are the most significant factors that could contribute to the improvement of low-cost houses.This question is one of the open-ended questions where the respondents are at liberty to use non-standardised answers and elaborate where necessary. The data under this question wishes to accomplish the requirements of the first objective of this study, which sought to identify and compare contributing factors to poor quality as perceived by the project managers and the contractors within the study area. In this question, participants were asked for their opinion on other factors that could highly contribute to poor quality of low-cost houses. The top five list by the project managers indicate that use of emerging contractors, use inferior building materials, lack of sufficient funding, use of unskilled labourers and lack of on-site training for labourers mostly contributes to the poor quality of low-cost houses.

On the other hand, the emerging contractors are of the opinion that lack of contractor training, use of unskilled labourers, use of unskilled contractors, poor supervision and the use of poor building materials are the main contributors to the poor quality of low-cost houses.

Question 7: Does the rate of housing demand / needs have an influence on the poor quality of delivered low-cost houses?

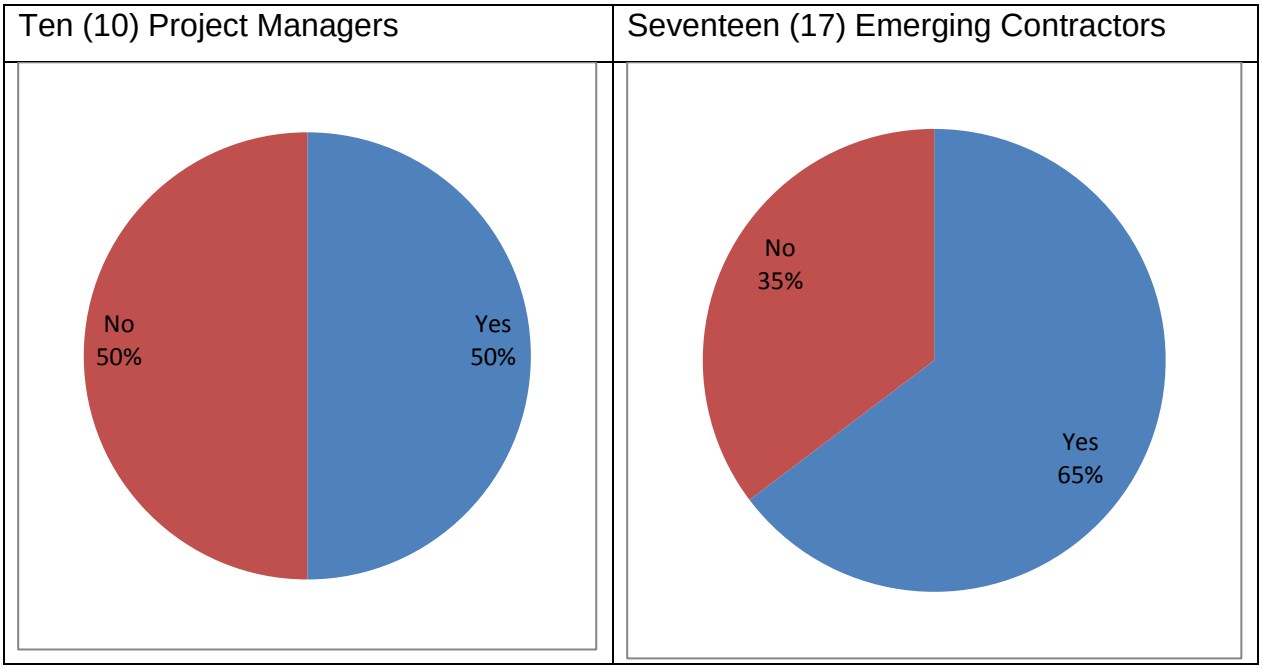


Figure 4.9: Rate of housing demand

This is an opinion question to the project managers and emerging contractors. Data presented in Figure 4.9 above indicates that the majority of the respondents (over fifty

percent) are of the opinion that the high housing demand contributes to the poor quality of low-cost houses. The data under this question wishes to accomplish the requirements of the first objective of this study, which sought to identify contributing factors to the poor quality of low-cost houses within the study area.

Question 8: Is the subsidy quantum amount sufficient to build a quality house?

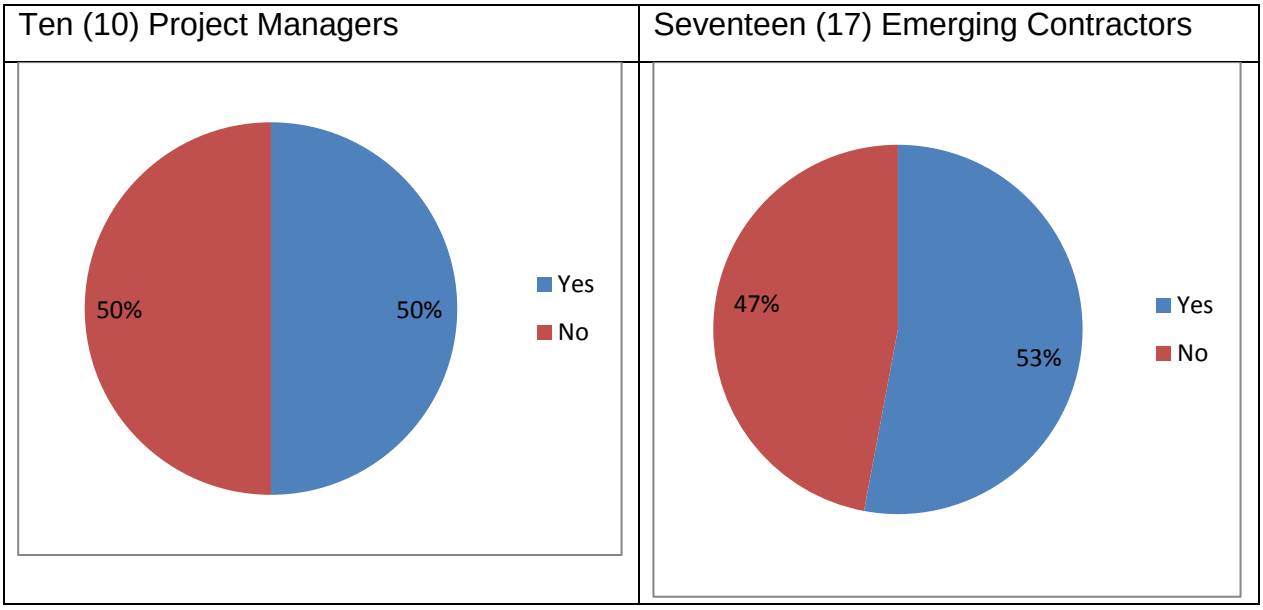


Figure 4.10: Subsidy quantum adequacy

This question aims to determine participants' opinions regarding the sufficiency of the government subsidy to build a quality house. This is to determine the appropriateness of the extent of the subsidy quantum on the construction of quality houses. This question wishes to accomplish the requirements of the first objective of this study, which intended to identify contributing factors to the poor quality of low-cost houses within the study area.

For the project managers, the respondents were equally spread on this item. The first 50% of the respondents are of the opinion that the subsidy quantum amount is enough to build a quality house, whilst the other 50% believes that it is not enough. Analysis of the emerging contractors' data indicated that 41% of the respondents are of the opinion that the subsidy quantum amount is enough to build a quality house, whilst the majority of 59% believe it is not enough.

Question 9: Can the quality of low-cost houses be improved?

Subsequent to the identification of possible contributing factors to poor quality, the respondents were further allowed to state, according to their opinion, whether the quality of low-cost houses can be improved or not. The data is correlated to the second objective of the study, which aims to identify key factors that can be improved to enhance the quality of low-cost houses as perceived by the project managers and emerging contractors.

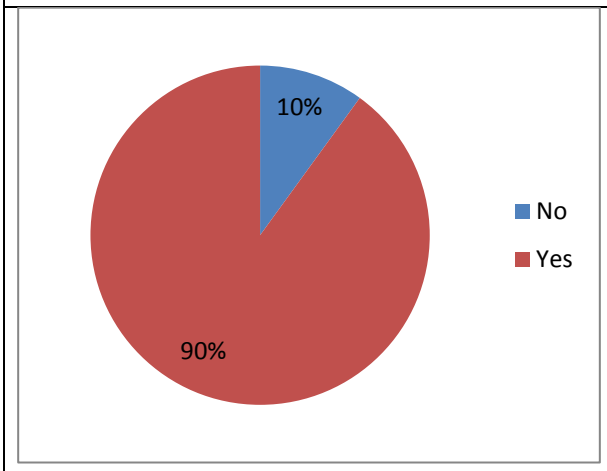
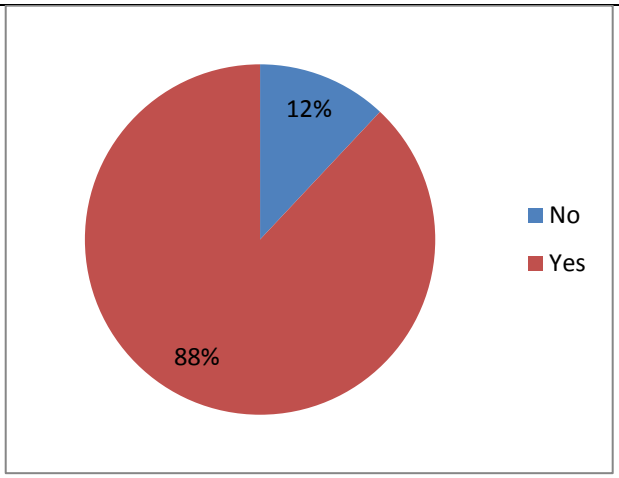
Ten (10) Project Managers	Seventeen (17) Emerging Contractors
	

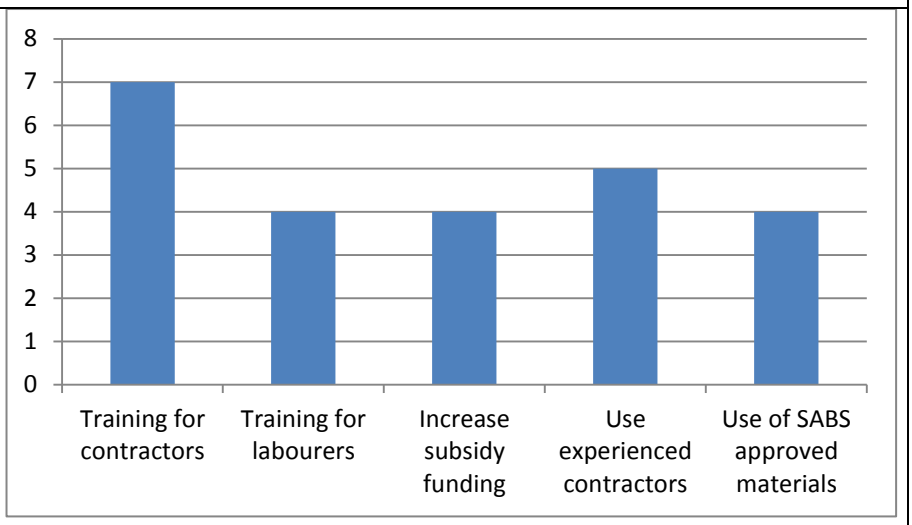
Figure 4.11: Low-cost houses quality improvement

A majority of over 85% for both groups are of the opinion that the quality of low-cost houses can be improved.

Question 10: What improvements would you suggest?

Seventeen (17) Emerging Contractors

1. Training for contractors
2. Use experienced contractors
3. Increase funding for subsidy housing
4. Training for labourers
5. Use of SABS approved materials



Ten (10) Project Managers

1. Use of experienced contractors
2. Continuous training for contractors
3. Increase site supervision.
4. Use of SABS approved materials
5. Improve house finishes

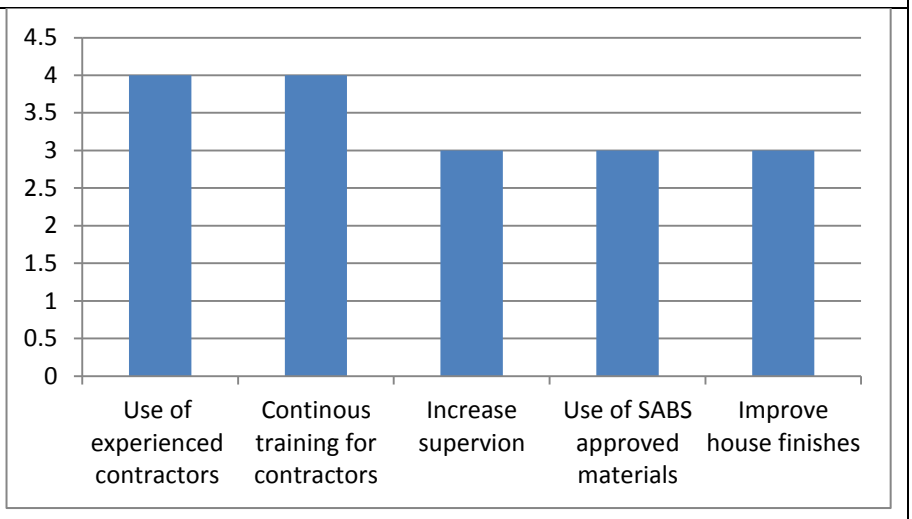


Figure 4.12: Suggested items of improvement

The participants were asked to reveal what they think are the most significant factors that could contribute to the improvement of low-cost houses. This question is one of the open-ended questions where the respondents are at liberty to use non-standardised answers and elaborate where necessary. The data under this question wishes to accomplish the requirements of the second objective of this study to identify and compare key factors that can be improved to enhance the quality of low-cost houses as perceived by the project managers and emerging contractors.

The top five list by the project managers indicated that training for contractors; use of experienced contractors; increased funding for subsidy housing; training for labourers;

and use of SABS approved materials can contribute highly to the improvement quality of low-cost houses.

On the other hand, the emerging contractors are of the opinion that use of experienced contractors; continuous training for contractors; increase site supervision; use of SABS approved materials; and improved house finishes can contribute highly to the quality improvement of low-cost houses.

Question 11: Do you understand the role of NHBRC in the housing construction industry?

Project Managers	All 10 (100%) responses by the Project Managers agreed that they understand the role of NHBRC in the housing industry.
Emerging Contractors	From the 17 emerging contractors who responded; 88% agreed that they understand the role of NHBRC and the remaining 12% say they do not understand the role played by this government parastatal.

In an attempt to fulfil the requirements of the third objective of this study, which is to identify quality management mechanisms currently available in the construction of low-cost houses and determine their influential level, the respondents were requested to share their understanding of the NHBRC. NHBRC was launched to monitor and regulate the housing industry for both private and subsidy sectors, protect the interests of the housing consumers and to ensure delivery of sustainable and quality houses. By means of this mandate, the NHBRC are the legislated quality assurers in the housing industry.

Question 12: How effective is the quality assurance mechanism currently used?

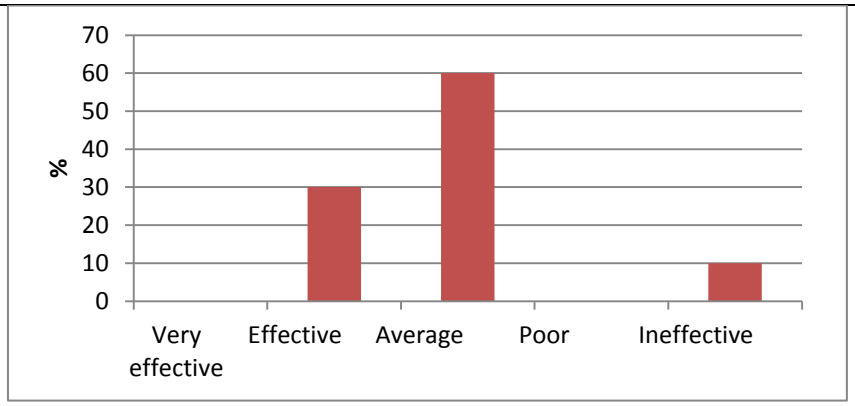
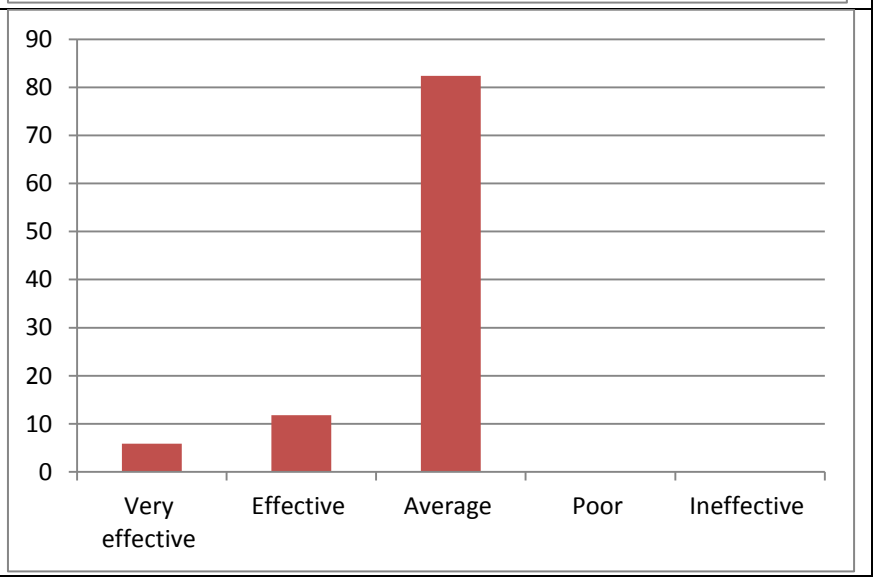
Ten (10) Project Managers	
Seventeen (17) Emerging Contractors	

Figure 4.13: Level of effectiveness of quality management mechanism

This question seeks to understand the effectiveness of the available quality management mechanisms in the construction of low-cost houses in eThekwini Municipality. In an attempt to fulfil the requirements of the third objective of this study, which is to identify quality management mechanisms currently available in the construction of low-cost houses and determine their influential level.

Figure 4.13 above indicates that a majority of over 60% of the respondents for both groups have rated the effectiveness of the quality management mechanism as average.

Section 3: Emerging Contractors' Development, Training and Skills

Training and Skills Development of emerging contractors is important in the sustainability of the construction industry. Data findings under this section were described in relation to the first and second objectives of this study, which aim to compare the contributing factors to the poor quality of low-cost houses and also to compare key factors that can be improved to enhance the quality of low-cost houses as perceived by the project managers and emerging contractors. From the literature review in chapter 3, it was perceived that training of emerging contractors is one of the instruments that will assist their businesses and improve their performance. This section aims to ascertain the level of training and skills for the contractors and its connection to the poor quality of low-cost houses.

Question 13: Have you ever been formally trained for the construction of houses? Did the training assist you in developing your skills?

The question seeks to determine the training levels of the emerging contractors.

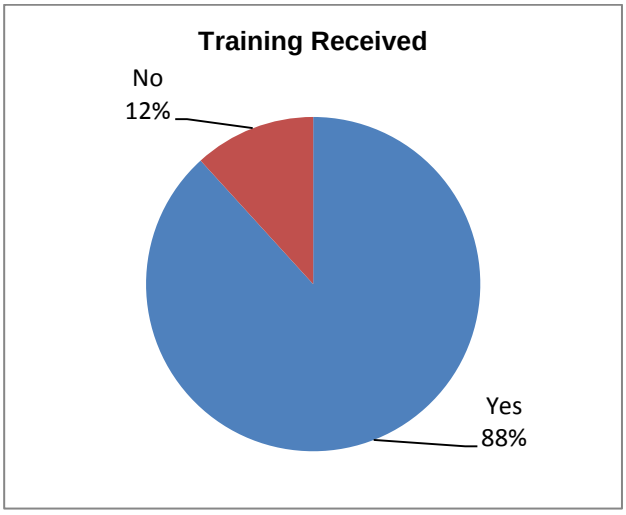


Figure 4.14: Training received

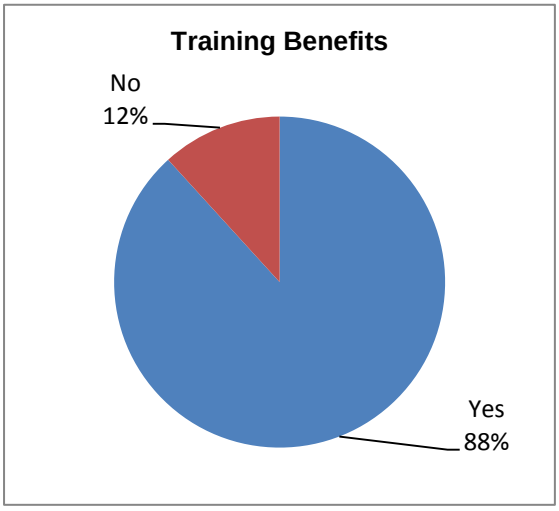


Figure 4.15: Training benefits

The majority of the respondents (about eighty-eight percent) indicated that they have received some kind of training and the training has largely assisting them in developing their construction skills.

Question 14: What other skills do you currently still need?

The question aims to determine any skills gaps and shortages amongst the emerging contractors working on low-cost housing projects.

The respondents identified a number of skills that they still need to improve. Amongst the responses, five skills appeared to be required by most respondents, namely:

- Project Management skills
- Financial skills
- Quality management skills
- Health and Safety
- Roof training

Question 15: How many people do you have in your construction team?

The question aims to determine how much human capacity the contractors have to construct low-cost houses.

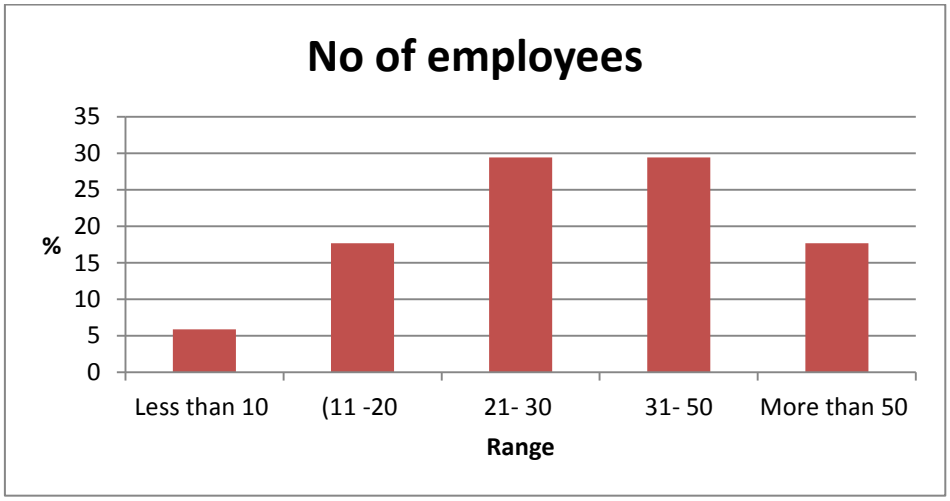


Figure 4.16: No of employees

A majority of the respondents indicated that they have between eleven and fifty employees on their database. According to the National Small Business Act No. 102 (1996) small contractors have between five and fifty employees, while medium sized contractors have between fifty and two hundred employees. This analysis indicates that the respondents are small contractors, as the majority confirmed having between eleven and fifty employees.

Question 16: How many low-cost houses do you deliver in one year?

The purpose of this question was to determine the amount of work the contractors have and in the process, to ascertain if the amount of work they receive has any influence on the poor quality of low-cost houses.

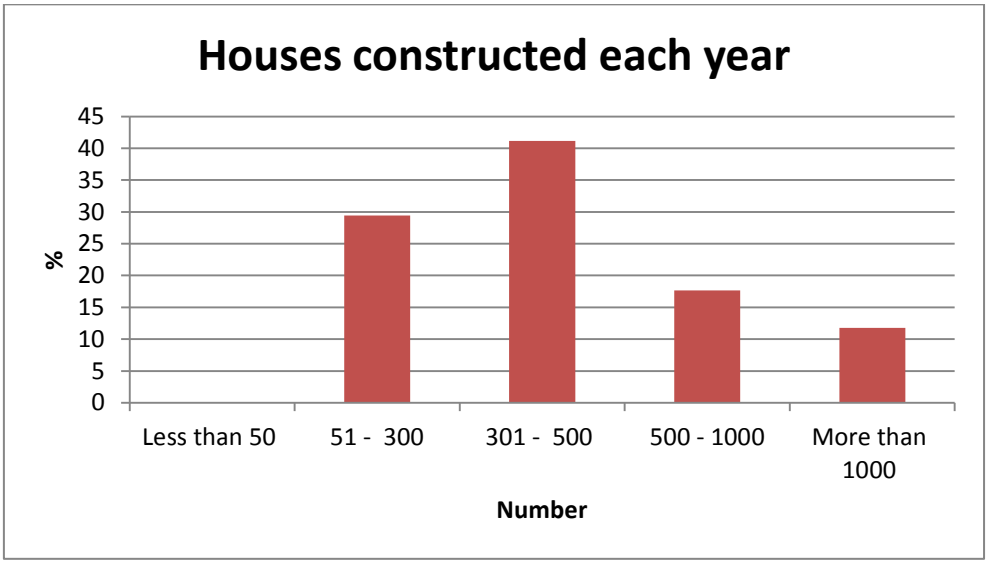


Figure 4.17: Houses constructed by contractors per year

This is linked to the capacity of each company, attesting to the observations that most respondents are small contractors. These contractors fill a vital gap in the construction industry as they are always ready to carry out the very small and odd projects that the big, well-established companies would not find profitable (Murray and Appiah-baiden, 2000). According to the CIDB contractor register, emerging contractors occupy the biggest percentage on the register.

Figure 4.17 above indicates that emerging contractors are busy with reasonable work, which requires them to have quality management processes in place.

Question 17: How many days do you take to complete one low-cost house?

The purpose of this question is to determine the time that the contractors take to complete a single house. The time required to construct a house is critical in determining the adherence to quality compliance requirements.

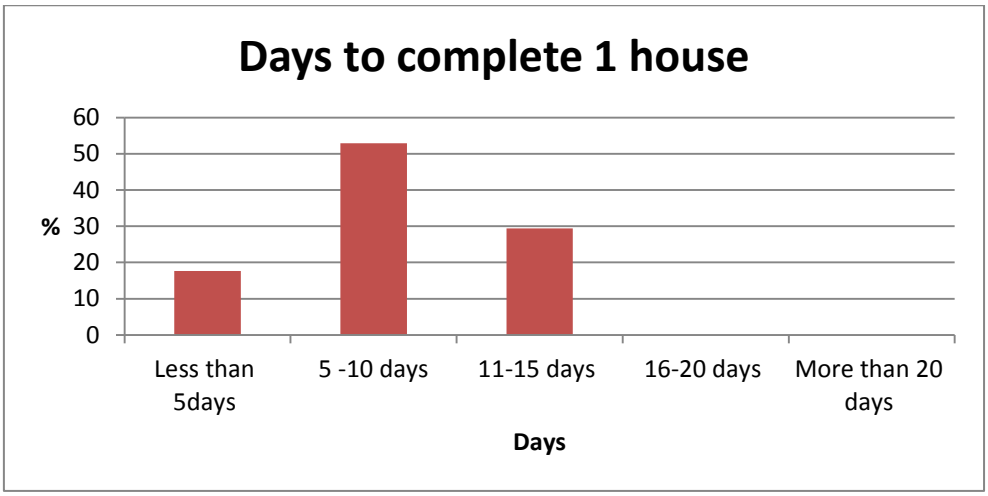


Figure 4.18: No of days to complete one house

From the analysis it is clear that the majority of over fifty-three percent of the respondents take between 5-10 days to complete a house.

Question 18: Do you have an in-house quality management system?

Predominantly 88% indicated having an in-house quality management system in the form of quality files, conducting tests, quality compliance check sheets, quality inspections, quality audits, use of skilled people and a dedicated quality inspector.

Question 19: Does your company use any of the following quality management techniques.

Table 4.4: Quality Management Techniques

Technique	N1	N2	N3	N4	N5	Totals	Mean Scores
(a). Quality management systems	0	1	0	9	7	17	
	0	2	0	36	35	73	0.86
(b). Quality assurance	0	2	2	8	5	17	
	0	4	6	32	25	67	0.79
(c). Quality control	0	2	6	6	3	17	
	0	4	18	24	15	61	0.72
(d). Quality improvement	0	4	4	5	4	17	
	0	8	12	20	20	60	0.71
(e). Quality	0	4	4	7	2	17	0.68

planning	0	8	12	28	10	58	

The emerging contractors indicated that they have knowledge and understanding of the various quality management techniques. Quality management systems proved to be the most popular amongst other techniques with the highest mean score of 0.86.

4.6 Chapter Summary

This chapter analysed the data obtained from the questionnaires. Graphs/Figures and tables were used to illustrate the results of the analysis. Chapter 5 summarises the findings of this study and concludes the study by making relevant recommendations.

CHAPTER 5

SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

5.1 Introduction

The purpose of this chapter is to establish and summarize the findings and discuss conclusions and recommendations arising from the review of relevant literature and the results derived from the data analysis. In this chapter the researcher explores how the findings answer the questions and objectives of this study and implications drawn from these findings.

5.2 Summary of the study

Chapter 1: The chapter provides the introductory description and context of the study. A brief introduction to quality of low-cost housing was presented. The chapter also focused on the background of South Africa's low-cost housing construction industry, highlighting various factors affecting the concept of quality management. Drawing from this, research problem, aim, objectives and questions were established. This chapter played an important role in planning the study and identifying important aspects.

Chapter 2: The chapter provides a comprehensive review of the existing literature on the subject of the study which aims at establishing the theoretical framework for the study and identifying the existing gaps. The chapter detailed the concept and context of the study. The work done in this chapter provided the researcher to with the knowledge and understanding on aspects relevant to the study.

Chapter 3: The chapter discussed in detail the research design, data collection methodology selected, various data collection tools were observed for this study and justification for the selections made. The aspects of ethics and integrity considerations were also covered in this chapter.

Chapter 4: The chapter investigated the data collection processes. Data presentation, analysis and discussions were done in detail in relation to the study objectives. The

chapter also outlined the sample targeted for this study, which comprised of the housing project managers and emerging contractors working at eThekwini Municipality.

Chapter 5: On this final chapter provides the summary of the entire research work. The chapter also provides the study implications, recommendations, and conclusions and suggested future studies based on the literature reviewed and data findings.

5.2.1 Purpose of the study

The aim of the study was to identify factors contributing to poor quality of low-cost houses and determine significant influences required to improve the quality. The study made comparison between the project managers and the emerging contractors on their view-points on the quality of low-cost houses and possible improvement to enhance the poor quality.

5.2.2 Methodology

Mixed research methodology was employed, using the survey as the research design and data collection tool through semi-structured questionnaires was used to identify factors contributing to poor quality of low-cost houses and determine significant influences required to improve the quality. The study population comprised of housing project managers and emerging contractors. Data was obtained from twenty seven (27) respondents, which represented a response rate of 67.5%.

5.2.3 Study Objectives

The objectives of this study were:

(a).To compare the contributing factors to poor quality of low-cost houses as perceived by the housing project managers and emerging contractors in eThekwini municipality.
(b).To compare key factors that can be improved to enhance the quality of low-cost houses as perceived by the project managers and emerging contractors.

(c). To identify quality management mechanisms currently available in the construction of low-cost houses and determine the influential level.

5.2.4 Findings in relation to the objectives

This section gives details of how the objectives of the study were achieved.

5.2.4.1 Objective 1: To compare the contributing factors to poor quality of low-cost houses as perceived by the housing project managers and emerging contractors in eThekwini municipality

This objective aimed to ascertain the perceived quality of the low-cost houses in the study area and the contributing factors to poor quality of low-cost houses. In achieving this objective, a comparison was made between the project managers and emerging contractor's opinions.

From the data analysed it is indicative that views of the project managers and those of the emerging contractors regarding the quality of low-cost houses is diverse. The results showed that there is whole lot of factors that contribute to poor quality of low-cost houses. The results also indicated that project managers are of the view point that, emphasis to empower the local previously disadvantaged individuals contributes highly to poor quality of low-cost houses, followed by the lack of training for contractors, use of less experienced contractors and lack of on-site training for labourers.

On the other hand, the emerging contractors believe that lack of training for contractors contributes highly to poor quality of low-cost houses, followed by lack of financial assistance, use of unskilled labours, use of unskilled contractors, poor supervision and use of poor quality building materials.

5.2.4.2 Objective 2: To compare key factors that can be improved to enhance the quality of low-cost houses as perceived by the project managers and emerging contractors.

The data related to this objective sought to identify and compare key factors that can be improved to enhance the quality of low-cost houses as perceived by the project managers and emerging contractors.

It is indicative that there is high need to improve quality of the low-cost houses and the major improvements suggested are: use of experienced contractors, continuous training for contractors, increase site supervision, use of SABS approved materials, Improve house finishes, increase funding for subsidy housing, training for labourers.

5.3.4.3 Objective 3: To identify quality management mechanisms currently available in the construction of low-cost houses and determine the influential level.

Training and Skills Development of emerging contractors is important in the sustainability of the construction industry. Data findings under this section was described in connection to the first and second objectives of this study, which aim to compare the contributing factors to poor quality of low-cost houses and also to compare key factors that can be improved to enhance the quality of low-cost houses as perceived by the project managers and emerging contractors. From the literature review in chapter 3, it was perceived that training of emerging contractors is one of the instruments that will assist their businesses and improve their performance. This section aims to ascertain the level of training and skills for the contractors and its connection to the poor quality of low-cost houses.

It was established from the responses and the literature review that contracting business is a business venture that is open to everyone. The research revealed that emerging contractors working in the construction of subsidy houses still require lots of training to acquire enough experience. The industry is enticing to the emerging contractors than the well-established contractors because of the limited subsidy funding. It was also noted that the calibre of people involved in housing delivery makes it difficult to deliver housing on time.

5.3 Implications of the study

This study has provided original insights into aspects that are required to improve the quality of low-cost housing in eThekwini Municipality, KwaZulu Natal Province. The outcomes of the study has given a better understanding of the fundamental problems affecting the quality low-cost houses and also identifies the aspects that can be

improved to ensure good quality low-cost houses. The study will significantly contribute both practically and theoretically to a number of aspects relating to construction of good quality low-cost housing. The study will not only benefit the government at large, it will also benefit the housing industry, housing consumers, and all other housing stakeholders. The study raises a number of opportunities for future research, both in terms of theory development and concept validation. More research will in fact be necessary to refine and further elaborate findings of this study.

5.4 Recommendations

Recommendations drawn from this study regarding the quality improvement of low-cost houses should be viewed as advice for a course of action for the aim and objectives of this study.

Drawing from the findings of the study, the following items are highlighted as major regarding the improving quality of low-cost houses:

- Organisational commitment
- Policy reviews and alignment
- Private sector involvement
- Community participation
- Continuous development of emerging contractors
- Increase supervision on sites
- Improve or develop adequate quality management systems
- Continuous improvement

In the view of the researcher, the DoHS and the Municipality should be in full control for the delivery and improvement of quality in low-cost houses. The need for training of emerging contractors is enormous and all aspects in terms of training should be considered to be of equal importance. It can also be determined that there is a lack quality management framework within the department and the municipality. These quality management frameworks need to be developed to ensure improvement in quality of the low-cost houses. Low-cost housing projects need a stringent quality management system.

From the study, it is evident that there is a need for government to address challenges faced by emerging contractors within the construction industry. Emerging contractors are highly involved in the construction of low-cost houses. They are the ones who deliver the physical product and this is where there is evidence of poor quality. This does not imply that they are culpable, but it does create a larger picture to demonstrate the origin of the problem. While there are contractor developments programmes in place, it is recommended that proper monitoring and control be introduced in order to observe progress and viability. The results of the study indicated that shortcomings exist in terms of the necessary skills among emerging contractors, which means there is a huge need for continuous training on different important skills.

It should be noted, that the basis of any development programme is the benefits it bestows to the communities. Housing remains a top priority for most people, regardless of their income levels.

5.5 Limitations of the study

This study was limited to aspects of poor quality of low-cost houses and determining significant influences to improve the quality in eThekwini Municipality in the KwaZulu Natal province. Therefore, further research study is required to investigate other challenges facing the quality of low-cost housing industry in other municipalities.

5.6 Future Studies

The research study covered only the factors contributing to poor quality of low cost houses delivered in eThekwini Municipality – KZN Province. During the study, there are gaps identified which still need to be researched, such as;

- The effects of Emerging Contractor Training Programmes
- The effects of time and cost on quality of low-cost houses projects
- The role of the NHBRC in the construction of low-cost houses
- The importance of developing and applying quality control and assurance practices within the low-cost housing projects

5.7 Conclusion

This study sought to respond to a number of research questions and objectives related to the improvement of low-cost houses. The researcher has asked what are the major contributors of poor quality in construction of low-cost houses, what are the influences required to enhance the quality of these houses and what are the existing quality management mechanisms employed in the construction of low-cost houses?

The reviewed literature and research results created certain opinions about the quality of low-cost houses within the study area. A number of contributing factors was identified, which require close monitoring to improve poor quality in low-cost houses.

The engaging of emerging contractors in construction of low-cost houses has advantages and disadvantages. There is extensive need to focus on continuous development and training of these emerging contractors in order achieve good quality.

It can be concluded from the study that issues of poor quality do not occur in a vacuum; it is affected by a number of independent variables. It is therefore important to consider all other aspects like challenges and constraints provincial and local government face when planning and implementing housing plans, programmes and policies.

It is evident that, there are no clear quality management system both in the province and local municipality. There is no proper process followed in ensuring proper quality controls. The DoHS and Municipalities should take full responsibility to ensure that all the quality system policies, programmes and processes that are required to successfully establish a detailed QMS in the low-cost housing construction sector are in order. The DoHS should develop comprehensive QMS and conduct workshops to ensure that officials fully understand its application and implementation.

6. REFERENCES

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APPENDICES

APPENDIX A: QUESTIONNAIRES

University of the Witwatersrand

School of Construction Economics & Management

Johannesburg

South Africa

Dear Sir / Madam

PARTICIPANT INFORMATION SHEET

Research Title: An investigation of factors required to Improve the Quality of low-cost Houses in eThekwini Municipality, KwaZulu Natal Province

My name is Luleka Nqentsu, MSc Construction Project Management student at the University of Witwatersrand. I am currently doing research study on the "An investigation of factors required to Improve the Quality of low-cost Houses in eThekwini Municipality, KwaZulu Natal Province"

Background of the Study

The low-cost housing sector is faced by a growing demand and a backlog for houses and the number of low-cost houses delivered is reportedly defective and inhabitable. The level of dissatisfaction due to poor quality appears to be dominant in the low-cost housing sector. Despite the substantial commitments and progress by the South African government, much still needs to be done to combat the existing challenges facing the low cost housing industry. This has leaded to initiation of this study in investing aspects that that will contribute to the quality management of low-cost. The study will be based in KwaZulu Natal at EThekwini Municipality in particular.

Invitation to participate

I, the researcher request for your participation in the research study I am conducting. The participation requested will be in the form of answering a questionnaire.

Aims of the study

The aim of the study is to investigate aspects that will contribute to the quality improvement of low-cost houses.

Objectives of the study

(a) To compare the contributing factors to the poor quality of low-cost houses as perceived by housing project managers and emerging contractors in eThekwini Municipality.

(b) To compare key factors that can be improved to enhance the quality of low-cost houses, as perceived by project managers and emerging contractors.

(c) To identify quality management mechanisms currently available in the construction of low-cost houses and determine their influential level.

Participation Voluntary

Participation to the study is pure voluntarily and there will be no consequences faced by the participants as a result of their refusal. The participants can always withdraw from the survey any time they feel like with no consequences.

Confidentiality

Efforts to keep participant's personal information confidential will be made.

Exposure to Harm

The study does not involve any acts that will be of any risk or cause harm to the participants.

Time to complete the survey

The questionnaires shall be administered manually and the expected duration to complete answering the questions should not take more than 15minutes.

Researchers Contact details

Should you have any pertinent questions and require further information please do not hesitate to contact me on the following details;

Luleka Nqentsu

Email: 12566609@students.wits.ac.za

Cell : 079 893 1029

QUESTIONNAIRES TO BE COMPLETED BY HOUSING PROJECT MANAGERS AND EMERGING CONTRACTORS FROM ETHEKWINI MUNICIPALITY

INSTRUCTIONS:

1. For the closed ended questions

   (a) Please select one number that best indicates your answer.

   1 - Strongly Disagree (SD)
   2 – Disagree (D)
   3 - Not Sure (NS)
   4 – Agree (A)
   5 - Strongly Agree (SA)

   (b) For those questions that require a YES or NO, please select one that best indicates your answer.

2. For open ended-questions, please be precise as possible to ensure that your answer is fully captured.

3. Please complete all questions

Section 1: General Information (ALL)

Gender	Male		Female	

Age Group	18-25		26-35		36-46		47-56		56 and over	

Years of service in this position								
Less than 2 years		2-5 years		6-10 years		More than 10 years		

Contractors Only

CIDB Registration Grade :

Is your company registered with NHBRC?	Yes	No

Section 2: Quality of low-cost houses in eThekwini Municipality, perception by Project Managers and Emerging Contractors (ALL)								
Question 1	Do you have a dedicated person responsible for quality assurance in your company?							
	Yes			No				
Question 2	What is the highest standard / qualification of the person responsible for quality assurance?							
	Below Matric	No Tertiary Education	National Diploma	Degree	Masters and above			
Question 3	How would you describe a good quality house? (please tick an appropriate answer).							
	• Houses finishes (Aesthetics)							
	• Conformance to prescribed project specification							
	• Conformation to structural and architectural and architectural requirements							
	• Satisfaction of the beneficiary expectations							
	• All of the above							
Question 4	What is the standard of quality of low-cost houses delivered in the past 5yrs at EThekwini municipality? On a Likert scale of 1-5; N1 = 1, N2 = 2, N3=3, N4 = 4, N5= 5.							
	Exceptional quality	Good quality	Satisfactory quality	Poor quality	Very poor quality			
Question 5	Could the following contribute to poor quality of low cost houses?							
	• Use of less experienced contractors in low cost housing construction					1	2	3	4	5
	• Use of unskilled local labours during construction					1	2	3	4	5
	• Lack of communication between housing stakeholders					1	2	3	4	5
	• Unclear project specifications					1	2	3	4	5
	• Lack of financial assistance for contractors					1	2	3	4	5
	• Lack of training for contractors					1	2	3	4	5
	• Use of poor materials					1	2	3	4	5
	• The emphasis on the empowerment of locally previous disadvantaged individuals contributes to poor quality					1	2	3	4	5

	delivery of houses.					
	• Political influences	1	2	3	4	5
Question 6	What are other contributing factors to poor quality of low-cost houses?					
Question 7	Does the rate of housing demand / needs have an influence on the poor quality of delivered low-cost houses?					
Question 8	Is the Subsidy quantum amount sufficient to build a quality house?					
Question 9	Can the quality of low-cost houses be improved?					
Question 10	What improvements would you suggest?					
Question 11	Do you understand the role of NHBRC in the housing construction industry?					
Question 12	How effective is the quality assurance mechanism currently used?					
Section 3: Emerging Contractors Development, Training and Skills (contractors only)						
Question 13	Have you ever been formally trained for construction of houses? Did the training assist you in developing your skills?					
Question 14	What other skills do you currently still need?					
Question 15	How many people do you have in your construction team?					
Question 16	How many low-cost houses do you deliver in one year?					
Question 17	How many days do you take to complete one low-cost house?					
Question 18	Do you have in-house quality management system?					
Question 19	Does your company use any of the following quality management techniques?					

Please share your general experience and contributions on quality management of low-cost house.

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END

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THANK YOU FOR YOUR TIME AND CONTRIBUTION, IT IS GREATLY APPRECIATED.

APPENDIX B: ETHICS CERTIFICATE