



D U R B A N
UNIVERSITY of
TECHNOLOGY

**Factors Influencing the Construction Project Success Rates
of Reconstruction Development Programme (RDP) Housing
Projects in the Eastern Cape:
A Quality Perspective: A Census Study**

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DECLARATION

The author hereby declares that the contents of this dissertation are his own words and that the dissertation has not been submitted simultaneously, or at any other time, for another degree.

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DEDICATION

This work is dedicated to my parents, my wife Andisa, my two sons Anathi and Khozi and also my daughter Ansa. Thank you for the support you have given me throughout my studies.

ABSTRACT

There were several problems facing Reconstruction and Development Programmes (RDP) housing projects caused by contractors using unskilled labour, misuse of funds, fraudulent claims, contractors asking for additional money or having left site. The overall scope of projects had no plan and no clear definition, poor project management and there was a lack of strategies to improve the quality of projects. This study recommends that it is imperative that project team members involved in the management of RDP housing projects have the necessary skills and level of education to execute their duties. Moreover, the Department of Housing and Local Government (DHLG) should draft a policy on Quality Management Systems (QMS)/good practices in respect of its project scope of works so that all stakeholders conform to the set standards. The people who are due to benefit from this housing are left in a state of despair, confusion and loss of hope from Government promises, with a subsequent increase in informal settlements.

The aim of the study was to investigate factors influencing the success rate of RDP housing in the Eastern Cape. This case study employed a quantitative approach to collect data. Questionnaires were analysed using descriptive and inferential statistics, namely, correlation t-test and Anova. The purposive sampling technique was used to select a sample size of 50 respondents from the Department of Housing and Local Government (DHLG) in the Eastern Cape Province. The advantage of this sampling technique is to reduce data to an intelligible and interpretable form so that the relationship between research problems can be studied and tested and conclusions drawn.

The DHLG could significantly improve the quality management of low-cost homes if it adopts the Project Alignment Model.

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ABBREVIATIONS

CM: Construction management

CPM: Construction project management

SACPCMP: South African Council for Projects and Construction Management Profession (a body that regulates the profession of construction, established by parliament)

CBA: Clay Brick Association

CIT: Construction Information Technology

BIFSA: Building Industry Federation of South Africa

OC: Organisational Culture

DHLGTA: Department of Housing and Local Government Traditional Authority

RDP: Reconstruction and Development Programmes

GDP: Gross Domestic Product

MDGs: Millennium Development Goals

PM: Project Management

PMBOK: Project Management Body of Knowledge

PMI: Project Management Institute

PMO: Project Management Officer

PPPFA: Preferential Procurement Policy Framework Act No. 5 of 2000

QMS: Quality Management Systems

TQM: Total Quality Management

EMS: Environmental Management Systems

PLC: Project Life Cycle

BEE: Black Economic Empowerment

HRD: Human Resource Development

IDP: Infrastructure Developmental Programmes

UN: United Nations

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

This chapter provides a background to the study, the research problem, objectives of the study and justifies the necessity for the investigation. The scope, the key assumptions upon which the study will be based and the methodology are also presented. Finally, the chapter presents an overview of the chapters that follow and lays the foundation for this dissertation. This study reviews the causes of poor service delivery and its impact on housing, project management (PM) and strategies to improve the quality of projects. The South African construction industry experienced problems related to the construction of low cost homes. Some of the problems related to RDP housing were over costing, completion delays, poor quality and functions.

This research intends to examine strategies to improve the quality of projects and to make recommendations to enhance the successful delivery of RDP housing projects in the Eastern Cape.

1.2 BACKGROUND TO THE STUDY

There was a decline in the number of newly built homes in the Eastern Cape Province by 54% from January to April 2008 and the entire country by 9.1% (Botha, 2008: 22). This is again highlighted by a report released by the department of housing and local Government and traditional authority (DHLGTA,

2008). In September 2000, the United Nations (UN) conference developed eight Millennium Development Goals (MDGs) which provide countries around the world with a framework for development, as well as time-bound targets by which progress can be measured. Goal four of the eight MDGs is to ensure shelter and exclusion which encompasses the targets of 2020, to achieve a significant improvement in the lives of at least 100 million slum-dwellers (Ocampo, 2006: 20). Goal four indicates that there are considerable and continuous affordable housing challenges facing the world's developed and developing countries.

In South Africa, there are problems related to project management experienced by contractors in the construction of low-cost homes in Cape Town (van Zyl, 2004: 19). This critically highlights the severe shortage of project management skills and calls for a means to seek ways to embed best practices in its field of endeavour. The Eastern Cape Premier alluded to the critical challenges facing productive capability such as inadequate access to productive resources, infrastructure backlogs and institutional challenges (Gxilishe, 2008). It is imperative that government has plans for the improvement of the skills crisis and land disputes in order to decrease the effects of the backlog of RDP housing projects.

Against the above background, this study will examine strategies to improve the quality of projects and to make recommendations to enhance the successful delivery of RDP housing projects in the Eastern Cape. The Reconstruction and Development Programme of 2001 is an integrated, coherent socio-economic policy framework of the Republic of South Africa (Housing white paper, 2001: 1).

1.3 THE PROBLEM AND ITS SETTINGS

It has been observed that some approved projects which are not completed timeously, are abandoned. The completed quality of work on these projects is defective. Structures crack and infrastructure deteriorates prematurely. Contractors become insolvent and lack capacity. It is sad that, still after more than 15 years in post-apartheid South Africa, we are experiencing such embarrassing incompetence. In fact, it is getting worse instead of better (Ntsaluba, 2009: 3). In addition, statistics by the Department of Housing and Local Government (DHLG) indicate that, as far back as 1995, the majority of approved houses had not been successfully completed (DHLGTA, 2008).

Approximately 104 houses from Mthumbane project at Port St Johns have not started since the signing of the contract on the 17th October 1997. There are 300 houses at Ncambele which were due to start on the 09th July 2004 but have been put on hold due to a misuse of funds by contractors. Table 1.1 shows an updated status of Eastern Cape housing projects. In some cases, the projected numbers of houses were reduced to a small batch. Consequently, forensic investigators were appointed to probe mismanagement and compile reports for the DHLG.

Table 1.1: Status of Eastern Cape RDP Housing Projects

Project Name	Total Units	No. Completed	No. Not Started	Status	Problems
Flagstaff	503	0	234	Blocked	Poor workmanship/Mismanagement of funds.
Lusiksiki	1117	1111	6	Blocked	Unavailble land/Fraudulent claims.
Mthumbane	425	321	104	Blocked	Misuse of funds.
Port St Johns	1000	948	52	Blocked	Non functional sanitation.
Mbizana	800	712	13	Running	Steep sites/Bad foundation soil.
Nkozo	300	83	183	Running	Steep sites/delivery of materials due to isolation.
Ncambele	300	0	300	Blocked	Contractors asking for additional money or left site.
Ndlunkulu	300	46	254	Blocked	Contractor appointments or asking for additional money or left site.
Ntabankulu	471	187	205	Blocked	Poor layout planning/Poor construction/Material delivery delays.
New Payne	300	71	229	Blocked	Contractor appointments or performing slowly

Source: (DHLGTA, 2008)

From Table 1.1, it is clear that the co-ordinators of RDP projects have not sufficiently confirmed the efficiency of the successful bidders in concluding each project, from initial consultation, to the level of planning, managing and construction phase, including the effective monitoring of all stages to completion.

This background of local, national and international challenges of projects in general and the efforts to survive in the highly competitive economic and environmental forces, the research problem can be stated as follows: There are numerous factors that contribute to be the success rates of RDP construction projects in the Eastern Cape. The present study has been undertaken with the objective of evaluating the construction project success rate in the Eastern Cape.

1.4 AIM AND OBJECTIVES

The aim of this study is to investigate the factors influencing the quality of construction project success rates of RDP housing projects in the Eastern Cape.

The objectives are:

- To identify the causes of poor service delivery in housing projects;
- To determine the effectiveness of project management principles and practices;
- To assess strategies to improve the quality of projects; and
- To make recommendations in order to develop a framework to enhance the successful delivery of RDP housing projects in the Eastern Cape.

1.5 THE HYPOTHESES

This study offers the following hypotheses:

- Ho: the appointment of inexperienced contractors/labour has an impact on project success;
Ha: the appointment of inexperienced contractors/labour will not have an impact on project success;
- Ho: the lack of proper supervision on site will hinder project success;
Ha: the lack of proper supervision on site will not hinder project success;
- Ho: leadership does not have the necessary qualifications;
Ha: leadership has the necessary qualifications;
- Ho: the process or activities of projects are incorrectly implemented; and
Ha: the process or activities of projects are correctly implemented.

1.6 RATIONALE FOR THE STUDY

At present, the Preferential Procurement Policy Framework Act No. 5 of 2000 (PPPFA) section (d) subsection (i) states that: contracting with persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender or disability; and (ii) implementing the programmes of the RDP as published in Government Gazette No. 16085 dated 23 November 1994. From the above, it could be stated that the principles used by the DHLG appear to be promoting the employment of local communities. The significance of this study is to contribute to the improvement of project management, enhance the successful delivery of RDP housing projects and also add value to the PPPFA principles used by government. Furthermore, the DLHG will benefit from this study by adopting some of the recommendations in order to improve its response to the MDGs of reducing poverty and provide good quality housing to poor people in South Africa by 2014 (ASGISA, 2007: 14).

1.7 SCOPE OF THE STUDY

This study is mainly concerned with RDP housing projects in the Eastern Cape with a focus on the shortcomings of these projects as experienced by the DLHG. This region has projects which were approved as far back as 1997, but which to date have 1418 houses still incomplete (DHLGTA, 2008).

Therefore, the findings of this study can only describe the success/failure rate of the RDP projects in Eastern Cape and cannot be generalised to success/failure rate of other projects outside the Eastern Cape. The study is only valid for the period in which the investigation is conducted.

1.8 RESEARCH METHODOLOGY

In order to address this problem, an overview of the research methodology is presented. The research methodology demonstrates how the objectives of the study were achieved. It describes the research type, target population, the questionnaire, data collection methods and the techniques used to analyse the data.

1.8.1 Research type

A census study was conducted. This research was quantitative, descriptive and cross-sectional in nature and aimed at identifying the causes of poor project delivery in housing; assessed strategies to improve the quality of projects; and made recommendations to enhance the success rates of RDP housing projects in the Eastern Cape. A questionnaire with 25 questions was used to gather data.

1.8.2 Target population

The target population of this study was the Department of Housing and Local Government Project Managers (PM) (15); Quality Coordinator (1); Quality Officers (20); Control Works Inspectors (9); and Assistant Project Managers (5) within the department who are involved in the management of the RDP housing projects in the Eastern Cape. Due to the number of people living in the houses, their illiteracy rates and accessibility problems, it was decided to narrow the population down to the above.

1.8.3 Data collection

Closed-ended questions were used to evaluate the understanding and implementation of knowledge on project management by government officials and the PM. In asking questions, researchers have two options. They may ask open-ended questions or closed-ended questions. According to Bell (2005), as quoted by Maree (2007: 161), analysing open-ended questions is more difficult than is the case with closed questions. Saunders, Lewis and Thornhill (2009: 362) purport that closed-ended questions are very popular because these responses provide a greater uniformity and are more easily processed. These questions are also less time-consuming for the respondent to answer. A questionnaire was used in this study to reveal information to be disclosed. The questionnaire consisted of a Likert-rating scale and listed statements for the respondents to select, where applicable. The four point Likert-style rating scale ranged from strongly disagree (1), to disagree (2), to agree (3), and to strongly agree (4). The researcher administered the questionnaire.

To ensure validity and internal consistency of the instrument, a questionnaire was sent by e-mail to the research supervisor and to two experts in the field of project management (SACQSP and SACPCMP) for comments. Maree (2007: 216) states that when a number of items are formulated to measure a certain construct, there should be a high degree of similarity among them since they are supposed to measure one common construct. The coefficient that is used to measure the internal consistency of an instrument is called Cronbach's Alpha coefficient and is based on the inter-correlations. If the items are strongly correlated with each other, their internal consistency is high and the alpha coefficient will be close to one. If, on the other hand, items are poorly formulated and do not correlate strongly, the alpha coefficient will be close to zero. Feedback was obtained regarding the following:

- Understanding by respondents;
- Clarity; and
- Aspects of confusion and internal consistency were verified.

The data gathered was analysed by using simple descriptive, as well as inferential statistics, namely, the correlation t-test and Anova.

1.9 DIVISION OF CHAPTERS

The remainder of this dissertation is structured as follows:

- Chapter two will focus on the literature review relating to the factors influencing the quality of construction project success rates of RDP housing projects in the Eastern Cape.
- Chapter 3 will highlight the research methodology for this study. The process that will be followed in conducting the research will be explained. This chapter will also focus on the measuring instruments, data collection procedure and data analysis.
- Chapter four will present and discuss the results of the study.
- Lastly, chapter five will draw conclusions and provide recommendations to improve project management and enhance the successful delivery of RDP housing projects in the Eastern Cape.

1.10 CONCLUSION

This introductory chapter provided a background to the study; and a statement of the research problem; objectives of the study; and justified the necessity for the investigation. The scope, key assumptions upon which the study will be based and the methodology were presented. Finally, the chapter presented an overview of the chapters that follow and laid the foundation for this dissertation.

On this basis, the next chapter proceeds by providing an overview of the factors influencing the quality of construction project success rates of RDP housing projects in the Eastern Cape.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

A review of the relevant literature that is related to the factors influencing the quality of construction project success rates of RDP housing projects in the Eastern Cape is conducted in this chapter. Specifically, the review is based on related literature from books, academic journals and other studies that have been conducted on the success/failure rates of low-cost housing. There is a focus on the meaning and understanding of a project; reasons of why projects fail; successful project management; and strategies to improve the quality of projects.

2.2 PROBLEMS/BARRIERS FACING CONSTRUCTION PROJECTS

A project is a series of tasks or activities needed to achieve a specific objective within certain technical specifications, within defined start and end dates, and subject to funding limits and resource availability (Dilts and Pence, 2005: 380). Similarly, Brooks and Combrink (2005: 44) define a project as a unique process, consisting of a set of co-coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including constraints of time, cost and resources.

Thwala (2005: 6) describes problems related to project management experienced by contributors in the construction of low-cost homes as follows:

- a lack of adequate and sustained political commitment and allocation of public funds for the programmes;
- a lack of precision about target groups and programming on the basis of information about beneficiary groups, and
- inadequate post-project maintenance arrangements.

These issues cast serious doubt upon the coordination and control of human and material resources to gain participation from all stakeholders in construction projects. Stakeholders are the people or groups whose lives or environment are affected by the project, but who receive no direct benefit from it. These can include the team families, people made redundant by the changes introduced, people who buy the product and the local community (Walker, 2002:19). Therefore, it becomes imperative that short-duration projects should not be allowed to rush off spending resources without the appropriate consideration of what has been targeted and who is going to do the work.

Some challenges of completed projects are over costing, completion delays, poor quality and functions that were originally specified (van Zyl, 2004: 20). For instance, poor layout planning, poor construction and material delivery delays were cited as some of the problems facing RDP housing in the Eastern Cape (DHLGTA, 2008). In addition, van Zyl (2004: 19) postulates that the main problem of RDP projects is demonstrated by the millions of rands spent by government on repairs for defective workmanship and the practice whereby contractors are employing local communities, whether skilled or not. Robbins and DeCenzo (2004: 20) define skill as the ability to demonstrate a system and sequence of behaviour that is functionally related to attaining a performance goal. Of interest in this study is the impact of project challenges faced by the project manager responsible for the day-to-day operations of the project and the

executive sponsor of the project, who provides an oversight function. Project failure is characterised by deficiency in design documents; problems with communication; lack of collaboration; ethics of project teams; and poor quality (Levy, 2007: 110). Similarly, Dilts and Pence (2005: 380) state that project failure or termination is the discontinuation of a project before it achieves its complete implementation.

This finding is also confirmed by Pillay (2006: 121) who explains that some of the most important reasons for project failure are:

- A lack of user involvement – all stakeholders must be involved from the inception to the completion of the project;
- Long or unrealistic time scales – the key recommendation is that the scope of work of complex projects could be subdivided into a number of smaller manageable units of work called work packages;
- Poorly defined project outcomes – requirements and specifications must be clearly defined;
- Scope – changes must be closely controlled and monitored to avoid growth in the scale of a project; and
- A lack of a meaningful change control system – uncontrolled changes cause chaos with a system under development. As a result, the recommendation is shorter time scales and a phased approach.

These authors emphasise the need for entire project planning which must encompass ongoing communication with stakeholders and other interested parties to bring together an appropriate level of expectations on a project, with well-defined limits. Furthermore, changes to the project must be closely supervised in consultation with stakeholders.

The above findings are congruent with the following view of Cicmil (1997: 392) in relation to principal sources of project failure:

- A poor understanding and identification of client/customer/end-user needs;
- An inadequate specification of project requirements and project constraints, which results in unrealistic project goals altogether;
- Organizational behaviour factors including structure, functions, performance, and associated the behaviour of groups and individuals;
- Bounded rationality in the process of project planning and project implementation, i.e., the lack of appreciation of dynamics and change; and
- Poor monitoring and control during the project implementation phase, as well as a lack of measurement and assessment of a project progress plan.

Cicmil (1997: 394) further states that, in various projects, the above critical factors are prioritized in a reverse order. This highlights the need for a complex, cross-disciplinary nature of project management (PM) where all stakeholders are part of the entire project life cycle. Subcontractors need to consider the issue of skills and levels of education when offering employment.

According to Wait (2005: 19), rework is the unnecessary effort of re-doing a process or activity that was incorrectly implemented in the first place. The primary sources of rework in construction are the documentation on which the construction activity is based. These largely consist of design changes, errors and omissions. Similarly, Levy (2007: 113) identifies the following causes of rework, i.e., the lack of user input; incomplete requirements and poor quality of construction projects; changing requirements and specifications; and a lack of

executive support and technical competence. Technical competence is the ability to apply specialized knowledge or expertise (Robbins and DeCenzo, 2004: 17). Wait (2005: 20) states that 10 – 15% of the contract value is spent on the direct costs associated with rework in the construction industry. Furthermore, Atkinson, Crawford and Ward (2006:688) identify the following factors that contribute to rework during construction:

- Management in the design organization – the insularity and aversion of architectural and engineering organizations to manage has resulted in poor quality and their marginalization within the industry; and
- Contract documentation – may be compromised when an organization submits a low design fee for a project, especially when design tasks are subject to ‘time boxing’. With time boxing, a fixed period of time may be allocated to complete each task, irrespective of whether the documentation or each individual task is complete or not. Poor workload planning within design organizations can also contribute to poor, inadequate project completion time.

Therefore, it is imperative for the project team and design organizations to have clear and defined channels for communicating and reporting progress, problems and any developments during the project life cycle.

2.3 PROBLEMS PERTAINING TO POOR QUALITY PRACTICES IN THE CONSTRUCTION INDUSTRY

Joubert, Cruywagen and Basson (2005: 31) explain that one of the main reasons for poor quality in the South African construction industry is that workers who are responsible for the physical execution of projects, and, therefore, for the

quality thereof, do not have sufficient training to deliver the expected results. These authors are of the opinion that organizations either do not have the time to invest in workers training or they are unwilling to do so because the workers are contracted on a project-to-project basis. Therefore, it is uncertain how long workers are going to be in employment. In addition, the authors explain that the cost to train workers is increasing and may be considered an unnecessary expense. In South Africa, there is very little, if any, correlation between the performance of workers and their remuneration. This shortcoming results in workers not striving to produce a product of high quality. These authors further describe, in more detail, problems pertaining to poor quality in the construction projects as follows:

- The use of subcontractors

Graham (2006: 38) states that the increasing use of subcontractors leads to the destruction of processes, resulting in subcontractors performing their tasks almost in isolation. In addition, the author postulates that for housing /residential projects, qualified subcontractors are becoming scarce and the objective of subcontractors is to complete their part of the work as quickly as possible, to use as little expensive labour as possible and get remuneration as soon as possible. Furthermore, Graham (2006) explains that using the American Institute of Architects (AIA) A201 General Conditions of the Contract for Construction as a benchmark, would improve their work. This statement is congruent with Noble (2009: 42) who states that it is a mistake to suppose that quality can be 'inspected into' the works. Instead, the underlying basis for achieving quality is to deploy skilled, motivated workers under the surveillance of competent supervisors. Surveillance means monitoring the works on an-ongoing basis to detect, in a timely manner, potential and existing problems (Noble, 2009: 41). Certainly, developing quality control, monitoring systems and remuneration of

subcontractors with respect to the standard of service or product results will minimise defective work.

- Monitoring and supervision

According to Mubarak (2005: 49), monitoring includes observing, reporting and perhaps analysis, and control adds corrective action. The author purports that only the subcontractors that have the power to take direct corrective action during the execution of the project. Keeping open communication channels among all involved parties and disseminating appropriate information are extremely important (Mubarak, 2005: 49). Similarly, Joubert, Cruywagen and Basson (2005: 32) state that shortage of trained and experienced supervising of personnel results in a situation where monitoring and supervision do not take place on a regular basis and, therefore, defects are not identified at an early stage. These authors further maintain that lack of supervision and monitoring leads to the continuous rectification of defective work. The employment of personnel and contractors with experience and necessary qualifications will reduce future costs associated with rework. Supervision is a direct psychological and technical support service and is helpful to the team (Gold and Roth, 1999: 9).

A study to determine the antecedents of rework in construction projects was conducted by Love and Edwards (2004: 219). They found out that poor supervision and inspection are causes for rework in the construction process. For both projects, the subcontractors work was not inspected by the foreman on a regular basis, which meant that poor workmanship went unnoticed until later in the project (Love and Edwards, 2004: 220). The above facts point out that competence in supervision and skills are largely the key to success and quality of work in construction projects.

- Tenders

Hughes, Hillebrandt, Greenwood and Kwaku (2006: 99) point out that the practice where tenders are awarded solely on price also has an influence on the quality of projects. The authors recommend that it might be better to investigate the changing nature of accountability so that it is based on what has been achieved, rather than on how much money was spent. According to Halpin (2006: 62), a tender is a process where the owner invites a quote for the work to be performed based on complete plans and specifications. Some of the main challenges are that RDP/construction stakeholders always find themselves in controversy with procurement policy practices at the expense of beneficiaries. Therefore, it is imperative that RDP stakeholders must, at all times, adhere to procurement policies and avoid any perceived or potential conflict of interest. This is confirmed by Halpin (2006: 64) who states that the word 'responsibility' is very important since the contractor submitting the lowest bid may not be competent to carry out the work. In addition, the author suggests the following aspects to curb shortcomings:

- Review the technical competence and experience;
- Review the current financial position based on the firm's balance sheet and income statement;
- Bonding capacity;
- Current amount of work under way;
- Past history of claims litigation; and
- Defaults on previous contracts.

- Culture

Ngowi (2001: 10), as quoted by Joubert, Cruywagen and Basson (2005: 32), states that society in South Africa tends to be fatalistic rather than deterministic. As a result, the following conditions of Total Quality Management (TQM) culture exist:

- Workers do not take responsibility for their own actions as dictated by TQM principles and tend to believe that all responsibility rests with management;
- Where TQM places emphasis on prevention rather than detection, workers leave initiatives towards prevention measures to higher authorities;
- Societies are more prescriptive than achievement orientated and, therefore, workers do not aspire to achieve awards – one of the aspects strongly emphasized by TQM;
- Due to their fatalistic nature, workers feel that problems such as quality are beyond their ability and should be solved by management; and
- Most workers on construction projects are recruited on a project basis and, therefore, do not spend much time with one organization. This prevents another important element of TQM, namely, that of employee empowerment to make decisions at their level of operation.

Oakland and Marosszeky (2006: 38) define culture as how business is conducted, and how employees behave and are treated. The authors further explain some of the most important components to be considered for creating a quality culture:

- Behaviours that are based on people interactions;

- Norms that result from working groups;
- Dominant values adopted by the organization;
- Rules of the game for 'getting on';
- The climate;
- Ensure creativity, innovation and learning activities are developed and implemented;
- Develop the values and ethics to support the creation of a total quality culture across the entire supply; and
- Implement the values and ethics through actions and behaviours.

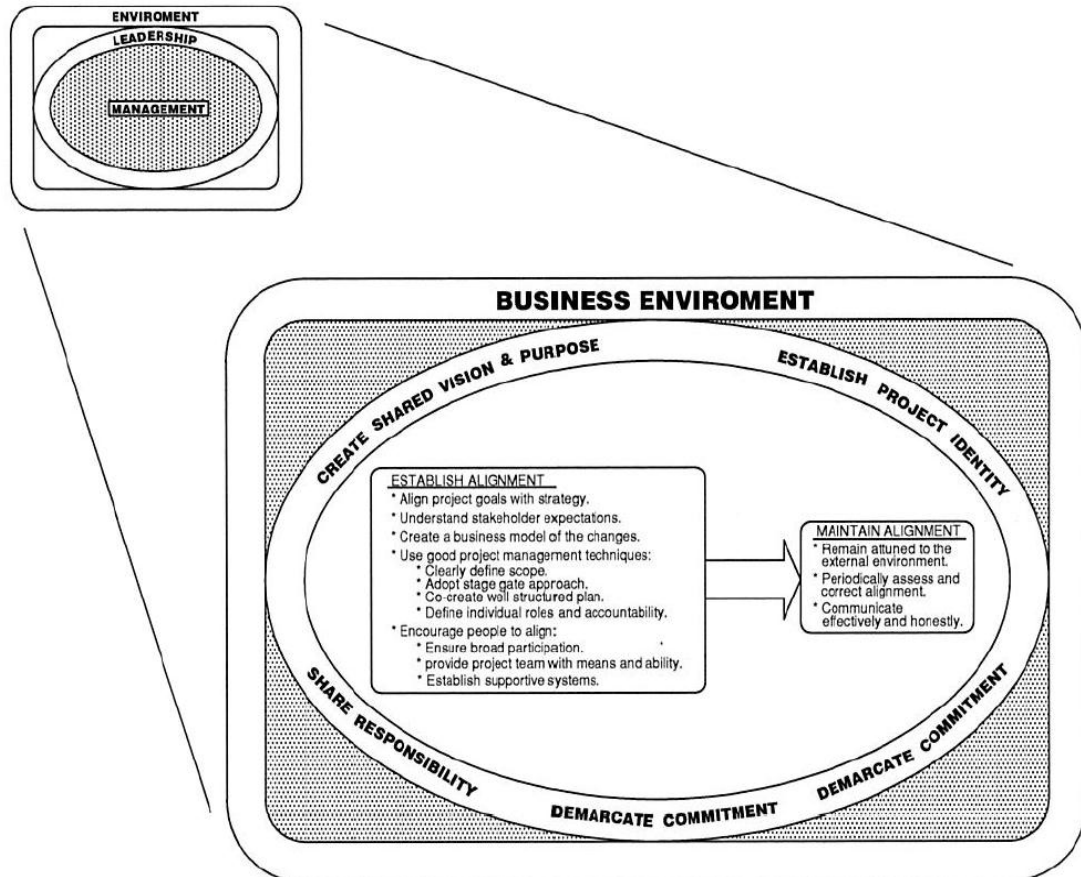
These contradictions highlight the need for care to be taken to employ permanent competent project teams in charge of projects. These project teams should be made up of registered engineers, surveyors and project managers in order to ensure that the project goals and objectives are met. In addition, project teams and personnel that are appointed at all levels and who are not suitably qualified and / or experienced to perform the tasks, must be appropriately trained through on-the-job interventions. Payment to contractors should be made at the different levels of the project stages, provided that the prescribed minimum standards have been met.

2.4 PROJECT MANAGEMENT EFFECTIVENESS

The Project Management Model of Box and Platts (2006: 374), shown in figure 2.1 below, provides a useful model to guide project leaders in creating and maintaining project alignment to increase their chance of success. Project success is dependent on proper planning, executive management support, completed on time and budget, with all features and functions as specified (Brown and Botha, 2005: 2). Problems caused by misalignment include confusion; waste of time, money and opportunity; diminished productivity; de-

motivation of individuals and teams; internal conflicts and power struggles; and ultimately project failure.

Figure 2.1: Project Alignment Model



Source: (Box and Platts, 2006: 374)

Box and Platts (2006: 372) investigated the significant changes in an organization’s business processes, where two projects were approved by the same executive and ran at the same time. However, project A was a failure, while project B was a success. The authors found that project manager A did not involve many people from the business in a series of “to be” workshops and communication events that jointly defined the project’s vision and there was a

lack of collaboration with stakeholders to identify overarching objectives linked to the organization's strategy.

The project manager also did not translate the project objectives into very specific deliverables. Site managers were not involved in defining project scope and making decisions that impacted on their sites, as well leading the implementation at those locations. There was also poor executive involvement, with no organization executives sitting on the project steering team. In conclusion, the authors summarised the key points of the model as a checklist to guide project leaders towards compliance with the model for a successful PM. In addition, the authors state that an inadequate project scope definition which is not discussed and signed-off by all stakeholders can contribute to frustration, the misuse of resources and a change in overall time completion.

Dilts and Pence (2005: 6) list a variety of factors that may influence project success or failure: namely

- Changes in initial project expectations;
- A change in the overall project importance to the organization;
- A change in need for the project (by the organization);
- Changes in overall time completion;
- Changes in user needs;
- Changes in overall project resources (people, material, funds);
- Technical difficulties;
- A change in the source of funds;
- Regulatory changes may cause problems;
- Internal politics;
- Politics external to the organization; and
- A change in commitment by the project champion.

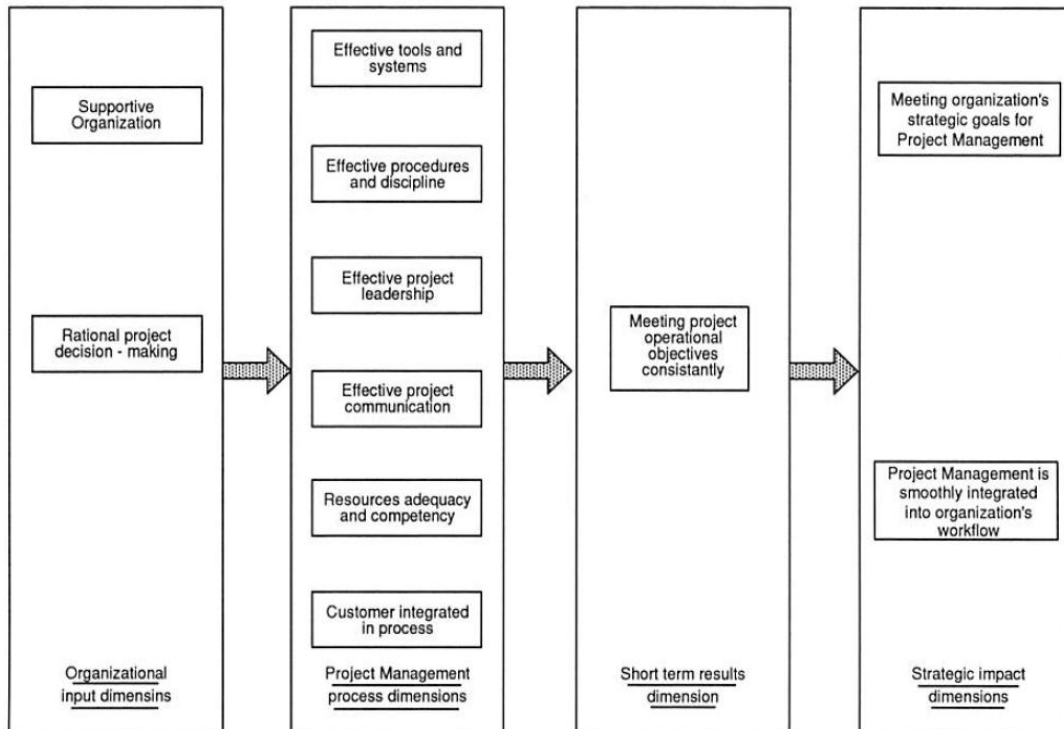
Dilts and Pence subsequently review, in more detail, the impact of the role of these factors in the decision for the termination of projects. Based on a multi-model view of termination decision-making, Dilts and Pence (2005: 393) point out that project termination decisions use a combination of the PM/executive and political appointees. The authors discovered that a project that has had a major change in initial expectations is one most likely to be at risk of termination. In addition, Dilts and Pence also found that, in most cases where projects have been terminated, these are due to four critical termination factors, namely: political (funding, champion and politics); customer need; a resource gap; and an expectation gap. In conclusion, the authors suggested that one other element of project success or failure that should be investigated is the methods used in setting initial project expectations with regard to performance, cost and schedule.

Morrison and Brown (2004: 80) found, based on an extensive study of the project success literature, very little to confirm a set of dimensions underlying the list of variables with a sufficient level of confidence. However, the authors cited that a closer inspection of the variables and respective categories suggest that there could be four main groups of dimensions toward a construct of project management success, namely:

- dimensions related to the organizational input to project management;
- dimensions related to how the project management processes are executed;
- dimensions related to how project management objectives are met; and
- dimensions related to how the rest of the organization benefits from, and is impacted upon, by project management in the longer term.

They developed a framework of eleven dimensions, as illustrated in Figure 2.2 below.

Figure 2.2: Framework of Eleven Dimensions



Source: (Morrison and Brown, 2004: 80)

Morrison and Brown (2004: 80) explained how the eleven dimensions, formed by the four main groups of dimensions containing approaches and principles of project management effectiveness, have been laid down by previous research:

- It departs from a narrow perspective to a multi-dimensional and balanced view of effectiveness;
- It focuses on multiple level of goals;
- It strongly emphasizes processes and resource factors; and

- It emphasizes the interests of different constituencies and recognizes the open-systems nature of project management.

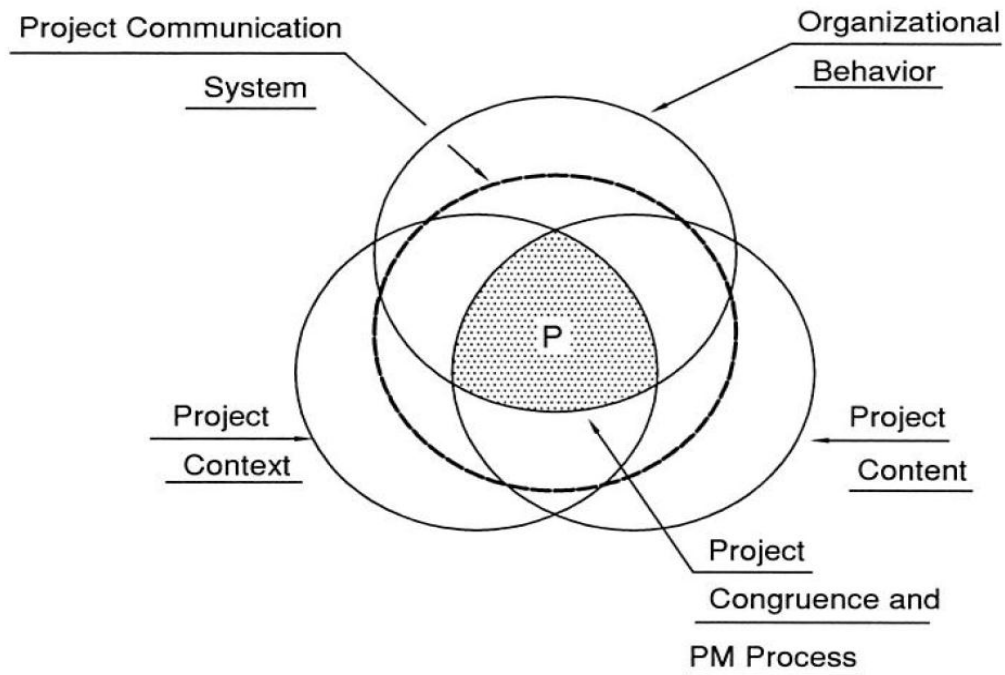
Therefore, project management success must have organizational input. Processes are executed, objectives achieved and benefits are derived from, and impact on, the beneficiaries.

Kuprenas (2003: 26) identified four processes as project management success factors and is supported by Morrison and Brown (2004: 80). These processes are:

- The organization in a project management structure;
- The completion of project management training;
- The frequency of design meetings; and
- The frequency of design status reports.

Cicmil (1997: 393) developed a framework, as illustrated by Figure 2.3, to help visualize the levels of inquiry into the areas of concern for effective PM. This framework also makes the implied paradoxes of projects more transparent:

Figure 2.3: Levels of Inquiry for Effective PM



Source: (Cicmil, 1997: 391)

The first level comprises of three conceptual aspects – project context, content and organizational behaviour that capture most of the requirements for an effective, unbounded approach to PM (Cicmil, 1997: 393). The first – level dimensions address the environment where needs for, expectations, nature, scope and constraints of the project, and also managerial and organizational aspects of the project, are generated. The area of overlap is the second level of project congruence within the project organization boundaries, where the PM process is supported by an effective communication system which enables the merger of all the former aspects. The author further states that very often projects are too carelessly and quickly narrowed down to the “shaded”, second level of operation, and managed as closed systems where PM techniques of

monitoring and control are often applied within the bounded rationality of initial plans.

Cicmil (1997: 393) summarises this as the need to accept the inevitability of re-planning in order to attain quality of project goals. In other words, to ensure that the deliverables will meet stakeholders' expectations. Therefore, this continuous awareness of first-level inquiry systems can ensure that the project operates and is managed as an open system. It also accommodates the exploration of the development and improvement of skills for project team members.

Similarly, the Project Management Body of Knowledge (PMBOK) (2008: 38) lists eleven knowledge areas of project integration for effective project management as follows:

- Project scope management;
- Project time management;
- Project cost management;
- Project quality management;
- Project human resource management;
- Project communication management;
- Project risk management; and
- Project procurement management.

In addition, the PMBOK refers to the above knowledge areas as 'Good practices', meaning that there is a general agreement that the application of those project management processes has been shown to enhance the chances of success over a wide range of projects (PMBOK, 2008: 38). Therefore, the implementation of the project management knowledge areas in the management of RDP housing projects would eliminate defects and address the issue of the

inconsistent delivery of projects, quality and success. The project management team and project stakeholders need to incorporate the policy of 'Good practices'.

Krause (2006: 11) argues a clear case that a preliminary evaluation of project failures show that approximately 40% of failures are caused by leadership issues; 30% result from planned activities; 8% as a result of technology; and 22% as a result of various other failures. This finding is confirmed by Boneli (1998: 11), quoted by Brown and Botha (2005: 2), who very aptly states that the structure of the organization, and with its project management culture have a profound effect on the ability of the project management discipline to thrive and develop. This finding is congruent with the view of Brown and Botha (2005: 4) that the implementation of a project management culture in an organisation would ensure the delivery of successful projects by:

- Developing the systems way of thinking about all ad-hoc services to be delivered. Brown and Botha (2005: 4) explain that this strategy is essential because it is a prerequisite for the displacement of traditional relationships and practices with new ones; comforts top administrators during periods of change; and demonstrates the validity of the project management process and top management's belief in it;
- Creating an organizational culture of acceptance of cross-functional integration. These authors further assert that the successful management of a project depends on the successful integration of multifunctional resources and are organised by way of an unplanned matrix organisation that cuts horizontally across the vertical (natural) inclinations of the incumbents of the said functions;

- Incorporating comprehensive planning systems. Brown and Botha (2005: 4) explain that it must be recognised that the projects of a sizeable organisation are not of a singular nature, but possess different characteristics that can be portrayed on a continuum from simple to complex. These authors further maintain that an appropriate management role must, therefore, be allocated to the project leader with reference to the type, size and complexity of the project. By implication, a continuum of such management roles, project management organisation structures and styles, and levels of authority for the project leader, for the execution of the organisation's project must be designed. This must be included to fit the project management methodology to the project, and not vice versa. This is also congruent with the view of Arain and Tipu (2009: 148) that private sector institutions focus more in project management related programs in comparison to the public sector institutions and public institutions should consider the PM as an essential component for project planning;
- The development of an organisation fitted-strategy, a project management supportive organisational culture and customised project management methodology consider a careful selection of systems appropriate for an organisation's array of projects needed to be done and they must be compatible with the existing financial and administrative systems of the organisation (Brown and Botha, 2005: 3-4); and
- Project leaders must be skilled in the various project management techniques. Brown and Botha (2005: 4) point out that very few project leaders start their careers in project management. Rather, they assume this role after serving in various other positions. Therefore, training in project management philosophies, principles and techniques is vital.

Drawing on the above discussions, implementation of a TQM culture in RDP housing projects would improve the quality of the production of projects.

2.5 STRATEGIES TO IMPROVE QUALITY OF PROJECTS

According to the Department of Public Works of South Africa (2004: 8), quality assurance plans for construction projects shall comply with the following: consultants selected for construction works shall confirm in writing with the Departmental PM that they have a Quality Assurance Plan, to ensure that the designs carried out are to an acceptable standard. The contractor's Quality Assurance Plan shall be compliant with the stipulations of the latest edition of SABS ISO 9001 (SANS 9001) specifications. The document further states that special preference shall be given to firms who have SABS ISO 9001 (SANS 9001) accreditation or SABS ISO 9001 (SANS 9001) compliant quality control systems. It is the intention of the Department to make accreditation in terms of SABS ISO 9001 (SANS 9001) a prerequisite for Consultants to be admitted to the Consultants Roster by the year 2008. Lastly, the selected consultant will be required to supervise the construction of the works and ensure that the Contractors comply with all the relevant acts and statutory regulations.

Khalid, Marosszky and Davis (2006: 34) provide a decision support tool for the long-term management of the subcontractor supply chain for achieving better quality in the construction industry, called: Pareto Principle including ISO 9000. The authors promote its use in many different contexts, such as prioritising customer requirements, examining the cost of poor quality, and the analysis of errors in relation to quality. Karim, Marosszky and Davis (2006) studied three projects in Australia to determine the nature and extent of defects and their causes in construction. On Project 1, workmanship caused 92 percent of defects, while on Projects 2 and 3, workmanship was responsible for 88 percent

and 73.6 per cent of defects, respectively. The workmanship and effective management thereof are significant factors regarding the quality of the project.

Similarly, Kerzner (2009: 45) states that some projects have no plan and clear definition on what and who will require training and recommends that customer involvement must not be overlooked as some training can be important to them. Cicmil (1997: 395) also confirms that the following integration of core aspects of Total Quality Management (TQM) culture into PM organizational culture and practices of all parties in the project network may improve the quality of projects (see Figure 3):

- Integration of internal and external customer-supplier chains for the provision of better service to customers;
- Error prevention through quality assurance systems;
- Employee development and care; and
- Good leadership.

Furthermore, the author suggests that an attempt must be made to explore linkages between the successful management of projects and TQM, and to invite an exchange of ideas and experience in this area of management development and organizational learning. Joubert, Cruywagen and Basson (2005: 34) define TQM as the management approach of an organization which concentrates on quality based on the participation of its members and aims at long-term success through satisfaction and benefits to all members of the organization and society. As its name culture suggests, TQM requires a total commitment to customer satisfaction through continuous improvement and innovation in all aspects of the business.

Stanleigh (2006: 2) identifies four basic strategies that can be used to improve the understanding of projects:

2.5.1 Ensure that all projects are strategically aligned

First, review lessons from projects currently underway or completed over the past year to uncover why they succeeded and to determine project prioritization issues. Next, develop criteria against which all projects can be prioritized, including their impact on corporate strategy and customers. Finally, align with corporate and departmental strategic plans, thereby demonstrating how each project's successful execution will support the corporate and/or departmental strategy.

2.5.2 Create a culture that supports a project management environment

This strategy requires the forming of a cross-functional steering committee to develop the approach and process for creating corporate change, including the creation of values and principles that identify the unique project approach for the organization and the development of project methodologies and processes.

2.5.3 Implement strategic project management best practices

The project management office (PMO) must hold a formal "Project Close – out Meeting" as soon as possible after a project is completed. The project sponsor, PM and project team should be in attendance as well as any outside resources and /or stakeholders who would like to contribute their ideas. The outcome of the project close-out meeting will be the creation of a

formal document of “Lessons Learned” for archiving, to be carried to future projects, their managers and their teams.

2.5.4 Create a strategic project measurement system – the strategic types of project success measurement criteria should include:

- The ability of the project to be managed within specified quality criteria;
- The ability to meet regulatory requirements;
- A consideration of resources available to the project team versus the number of resources they make use of;
- The ability of the project to meet all deliverables;
- The successful management of all major issues; and
- Customer post-surveys which indicate satisfaction with the product or service delivery from the project.

This finding is in agreement with the view of Maya, Rahimi, Meshkati, Madabushi, Pope and Schutle (2005: 23) that lessons learned from the project implementation can improve the quality and culture of any project management, leading to successful projects delivery. Furthermore, the authors aptly proposed three strategies to overcome causal factors for poor quality in project management:

- Organizational
 - Management – driven initiatives and systems-based processes are needed to effectively collect and share lessons;
 - The value and importance of lessons learned to organizational goals needs to be emphasized and put in practice at all centres;
- Tools and System Processes

- There is a need for the usage of information technology tools and review processes and checks;
- A systems-based approach should include a built-in incentive, check points, and consistency; and
- Cultural
 - The notion that lessons learned are not apt, relevant, or useful, and that there is insufficient time lessons learned; and
 - Communication of lessons learned among centres and headquarters is complete, and application of lessons learned.

Consequently, leadership in collaboration with the project team needs to emphasize the importance of the archiving and accessing of lessons learned information at all Department of Housing and Local Government (DHLG) centres.

Similarly, in terms of quality management, Atkinson, Crawford, and Ward (2006:688) identified the following six strategies to improve quality for project management:

- Motivation and commitment of site management;
- Get all stakeholders involved early and frequently. Ensure key stakeholders are engaged early and communicated with well throughout the project.
- Understand the needs of the users. Develop a data utilization strategy in collaboration with end-users that outlines what information is required, how often it is required; what format it's required in; and how they will access the information.

- Focus on comprehensive documentation. Mappings to source systems and associated workflows provide the necessary context to the information. Furthermore, as workflows and source systems change, they need to be documented and communicated to all stakeholders. This will ensure a consistent understanding and interpretation of information derived from the analytics tools.
- Keep the data relevant to the end-users. The sooner issues can be spotted and brought to the attention of process owners, the easier it is to provide coaching and to manage overall process performance. Likewise, once a process has stabilized, quality teams will move on to other issues, and the analytics need to be flexible to support these changes in focus.
- Set realistic expectations. Keep end-users informed as to the capabilities of the tools, include what reports, dashboards, and other information tools are in-scope (and out-of-scope); what data is available for ad-hoc reporting; and what the expected turn-around times are for new development and ad-hoc data requests.

Furthermore, Burke (2010: 270) purports that the “project quality management” knowledge area of project management incorporates the techniques to determine the project’s quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken. Similarly, the PMBOK (2008: 189) explain that project quality management is the discipline that is applied to ensure that both the output of the project and processes by which the outputs are delivered meet the required needs of stakeholders. Burke (2010: 275) describes the following eight processes to establish the required quality for project management:

- Quality planning – the process of identifying the quality standards to be achieved and the testing required to confirm the project has achieved the required condition to satisfy the terms of the contract. This requires input from the stakeholders to determine their needs and expectations;
- Quality assurance – the process of evaluating overall project performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards. It is a dynamic iterative approach which monitors and integrates;
- Quality requirements – determined by the client and stakeholders in the scope of work, specification and contract;
- Quality control and quality audit – inspections and quality audits provide feedback on the project's present capability and performance. Similarly, Noble (2009: 41) states that quality control encompasses surveillance, inspection and testing;
- Quality trends – by plotting and extrapolating quality trends, the PM is able to get an indication of the general direction in which the project is heading. This provides more information than the snap-shot given by a project status report;
- Missing processes – quality control feedback on performance may highlight the need for certain missing or inefficient processes, procedures and documentation and by fixing these deficiencies this should reduce production costs (re-work), and this pro-active approach gives client and stakeholders more confidence in the project team's capabilities;

- Continuous improvement – enforces what went right and introduces new techniques to continually improve future performance; and
- Quality control – the process of monitoring specific project results to determine if they comply with relevant quality standards and to identify ways to eliminate the causes of unsatisfactory results by inspection processes, witness, testing or hold points and commissioning. Halpin (2006: 63) postulates that inspection is the formal verification of works presented as being in conformity with specified requirements.

Similarly, Noble (2009: 41) describes the following fundamentals as far as quality on construction project is concerned:

- It is important that maximum responsibility for quality be exercised as close as possible to those that carry out the physical work. The author further suggests that the basis for achieving quality is to deploy skilled, motivated workers under the surveillance of competent supervisors;
- A potential contractor/developer should have a proven record of successful construction operations comparable to those of the project in hand;
- Simple, coherent and realistic corporate procedures and working methods, appropriate to and easily adaptable to the specific needs of the projects should be established;
- The above-mentioned procedures and working methods set within the context of quality management system (QMS), which are a working reality, should be fully supported by top management;
- A pool of experienced individuals should be available to be deployed on the forthcoming project; and

- Physical resources, ample and appropriate for the needs of the project, should be provided.

Furthermore, Oakland and Marosszeky (2006: 98) are of the opinion that construction projects should involve the customer in the process from design through to construction. Therefore, they experience the process as a service sector and the output as a product. The authors further define five SERVQUAL dimensions assessment tools in the service sector for quality improvement:

- Reliability – the ability to perform the promised service dependably and accurately;
- Responsiveness – the willingness to help customers and provide prompt service;
- Assurance – the knowledge and courtesy of employees and their ability to inspire trust and confidence;
- Empathy – the caring, individualized attention the firm provides to its customers; and
- Tangibles – the physical facilities, equipment, and appearance of personnel.

The mandate of the National Housing Department of South Africa Act 107 of 1997 (Republic of South Africa, 1997) is to ensure financially affordable and sustainable housing developments. Therefore, project managers and developers should have a thorough understanding of the strategies of project quality management in order to ensure that the project runs according to plan; identify successes, problems, mistakes and weaknesses so that they could be rectified; and provide basic information to aid the design of the interface, match achievements; and ensure that objectives are met.

2.6 QUALITY CONTROL DURING THE PROVISION OF CONSTRUCTION PROJECTS

According to the Project Management Body of Knowledge (2008: 189), project quality management includes the processes and activities of the organization that determine quality policies, objectives and responsibilities so that the project will satisfy the needs for which it was undertaken. Maritz (2005: 65) purports that production specification in a construction project refers to written information prepared by the design team for use by the construction team, the purpose of which is to define the products to be used, the quality of work, any performance requirements, and conditions under which work is to be executed. The author further points out that defects in the South African construction industry are commonly caused by poor or missing information. The author also raises the following issues:

- The South African construction industry is still behind developed countries that have been involved in the development of construction information systems over the years;
- There should be standardisation of contract information in order to determine the percentage of contracts awarded on criteria other than price, as well as how many contracts meet the principles of modern forms of contract; and
- Customer satisfaction must be achieved with construction products, delivery time, and quality of service and product.

Therefore, failure to satisfy the above requirements can lead to inaccurate specifications being used that result in poor quality and use of unskilled workmanship, which further yield to the structures deteriorating prematurely.

Maritz (2005: 79) recommends the following six significant aspects for quality control:

- An online computer system where all construction parties work simultaneously;
- Merge international standards into the national systems;
- Harmonisation of the different systems will be necessary, due to growing international competition and globalisation, as well as the growing use of construction information technology (CIT);
- There should be only one comprehensive and up-to-date national building specification system covering all types of construction work; and
- Production specification to be linked to SABS/STANSA standards.

Noble (2009: 14) states that, on most projects, for potential contractors to be entered on a list of bidders, they must be able to show that they have in place a quality management system complying with ISO 9001:2000 standards. Similarly, Bisschoff, Govender and Ootsthuizen (2005: 73) state that the PM of a well-managed project achieves the outcomes of the project to the satisfaction of all stakeholders, and ensures that everything happens as planned, or better than expected. In addition, the authors postulate that the PM must invest in quality management systems (QMS) from the beginning of the project in order to avoid poor results. It is evident that QMS need to be the focus of the project life cycle, together with other project management concept areas. Therefore, in pursuit of successful projects, organizations need to comply with the QMS and modelling in order to maintain the highest quality standards from the customer and other stakeholders. Furthermore, the authors describe three processes for the quality management of any project:

- Quality planning – responsibilities involve identifying quality standards for the project and satisfying them. PM must plan to access, inform and manage project teams and stakeholders on quality requirements of the project using specific standards that lead to a quality product;
- Quality assurance – responsibilities involve regularly evaluating the overall project performance in order to report with confidence that the project will satisfy the relevant standards. The process of quality assurance involves inputs, tools, techniques, and outputs; and
- Quality control – responsibilities involve monitoring specific project results to assess compliance to quality standards and to eliminate unsatisfactory performance, process or products.

Similarly, a study to determine the antecedents of rework in construction projects by Love and Edwards (2004: 219) identifies a list of causes, which include poor supervision and inspection. The authors reported that subcontractor's work was not inspected by the foreman on a regular basis, which meant that poor workmanship went unnoticed until later in the project. The above facts point out that competence in supervision can increase the rate of success and quality of construction projects.

Similarly, two years after the Department of Water affairs and Forestry (DWAF) started transferring the responsibility of water and sanitation service delivery to local government, the question asked is why the concepts and plans are not executed effectively (van Zyl, 2004: 9). The author states that the water service providers lack technical expertise and these problems must be understood in a holistic manner. Therefore, it is necessary to examine what actually happens during construction. Consequently, it is necessary that the profession should create an environment for staff development on supervision and skills

development programmes so that they can independently contribute to the success and quality of the project.

According to Buckley and Caple (2004: 8), the experience contributes to the learning and development of supervision skills. In addition, these authors are of the opinion that management development programmes have often been criticized for focusing, sometimes almost exclusively, on structured training and educational events and ignoring the value of varied and planned inter- and intra-organizational experiences. Furthermore, these authors state that the use of learning by experience, through solving an actual problem of an organization, has done much to redress this particular imbalance.

Robbins and DeCenzo (2004: 5) state that all organizations, regardless of their size or focus, share three common characteristics. First, every organization has a purpose. Second, each organization is composed of people. Third, all organizations develop a systematic structure that defines the various roles of members and sets limits on their work behaviours, which may include giving some members a supervisory responsibility over other members. It is certainly a case that there is a proliferation of project development of various types in the country. In conclusion, these authors are of the opinion that part of the problems relating to poor quality and failure of projects revolves around the interpretation of management and development. Consequently, management should have a plan in place for supervision and management skills when embarking on any construction projects as a measure for quality control.

Furthermore, Robbins and DeCenzo (2004: 4) state that, in order to reach goals in today's dynamic organization, management needs supervisory competencies. These include interpersonal, technical, conceptual and political capabilities. The authors explain that the term "management" refers to the process of getting

things done, effectively and efficiently, through and with other people. In addition, these authors say that the term “process” in the definition of management represents the primary activities that supervisors perform.

Stephen (2004: 17) explains technical skills as follows: the technical demands of top management jobs tend to be related to knowledge of the industry and a general understanding of the organization’s processes and products. This is not true for managers at other levels. Most supervisors managing within areas of specialized knowledge are the director of computer systems, the regional sales manager, and the supervisor of health claims. These supervisors require technical competence. Similarly, Stewart (2001: 1) points out that it was not necessary for her to know how to cook steaks or pancakes in order to be Chief Executive Officer (CEO) at international House of Pancakes as top management activity is composed of generalists. Indeed, adequate competent supervisors and technical staff in the construction industry could help to improve the work of the emerging developers, thereby enhancing the quality of projects they undertake.

According to Robbins and DeCenzo (2004: 11), supervisors have become increasingly important as organizations are implementing significant change and quality programmes to cut costs and increase productivity. These organizations include Boeing, IBM, Chevron, General Motors, United Airlines and Sears which are just a few of the major companies that are exploring the competence of supervisors. In addition, these authors postulate that knowledge about a subject is important, but just as important is whether one can do anything with that knowledge. Looking from the concept of skills, no one would want a surgeon who had never operated on anyone to operate on you. The authors further state that effective supervision includes planning and control, stimulating individual and group performance, coping with workplace dynamics, organizing staffing

and employee development. These findings point to the fact that skills and experience have far more implication for the current transformation in construction and need to be considered in the whole process.

Management should put in place mechanisms to develop supervisors, skills development and training of personnel that could equip newly appointed staff and PM to avoid rework and improve the quality of service. In addition, organizations should create an enabling environment for experienced supervisors to conduct both technical and psychological support and empower others with knowledge and skills so that they can contribute to the existing body of PM.

The South African Council for Projects and Construction Management Profession (SACPCMP) refer to the quality control process as the inspection or supervision process. Quality control ensures that quality checks have been consistent, fair, reliable and valid. Therefore, it is imperative that an effective PM plan should abide with International Federation of Consulting Engineers' (FIDC) standards for the construction industry. In addition, PM must integrate quality management systems with the project management principles as contained in the PMBOK. This will ensure that no more claims and disputes leave contractors bankrupt, thereby requiring the employer to re-bid the job, and almost inevitably, pay a higher price to get work done.

Implementation of the above control measures during the construction process could reduce defects and improve the management of quality in the construction industry.

2.7 COST OF TRAINING AND QUALITY MANAGEMENT PRACTICES

Macdonald (2004: 26) is of the opinion that the corporate and resource requirements remain completely intertwined as the organization can grow if people are suitably developed and vice versa. Similarly, Krause (2006: 12) lays out some of the reasons why some projects fail. One reason is poor training. Training is a planned and systematic effort to modify or develop knowledge, skills or attitude through learning experience, and to achieve effective performance in an activity or range of activities (Buckley and Caple, 2004: 5). This should include critical skills gaps which can be addressed by offering team - building training.

Similarly, Pacelli (2004: 123) maintains that some projects have no plan and clear definition on what and who will require training and recommends that customer involvement must not be overlooked as some training can be important to them. The author states that the project team may develop the wrong type of training and suggests the following:

- the greater the complexity of the project that is being implemented, the greater the need for instructor-led training; and
- if one's organisational culture has a preference towards a particular type of training, consider keeping with the culture, particularly if the project complexity is high.

Joubert, Cruywagen and Basson (2005: 31) mention that one main reason for poor quality in the South African construction industry is that workers who are responsible for physical execution of projects, and, therefore, for the quality thereof, do not have sufficient training to deliver the expected results. Furthermore, these authors state that companies either do not have the time to

invest in worker's training, or they are unwilling to do so because the workers are contracted on a project-to-project basis and, therefore, it is uncertain how long the workers are going to be in employment. The authors are of the opinion that the cost to train workers is going up and may be considered an unnecessary expense. The authors also found that, in South Africa, there is very little, if any, correlation between the performance of workers and their remuneration. Therefore, workers do not strive to produce a product of high quality. This point is supported by Hinzelman (2004: 30) who recommends the recognition of Human Resource Development (HRD) within the construction sector and a reliance on line management to increase levels of productivity.

In addition, the author reports that training and development opportunities tend to be provided on informal 'ad hoc' basis within construction companies and large construction companies generally understand the concept of HRD, but very few actually practise it. Hinzelman (2004: 31) cited that this traditional under-reliance on HRD reflects the industry's reliance on 'hard' systems approaches or those commonly attributed to 'personnel management' practices, where employees are viewed as any other factor of production whose cost should be prioritized.

This discussion highlights the new dispensation that, where Black Economic Empowerment (BEE) gives opportunities to emerging contractors and project managers, there must be plans and initiatives to enhance their skills through training programmes. Furthermore, it is recommended that the existing in-house expert in the construction profession who understands technology and the importance of speedy delivery to meet customers' needs must be involved. According to Brown and Botha (2005: 3), project leaders must have skills in various PM techniques. Similarly, Schussler (2003) is of the opinion that poor

management is another cause of poor performance in the South African construction industry and results in poor quality.

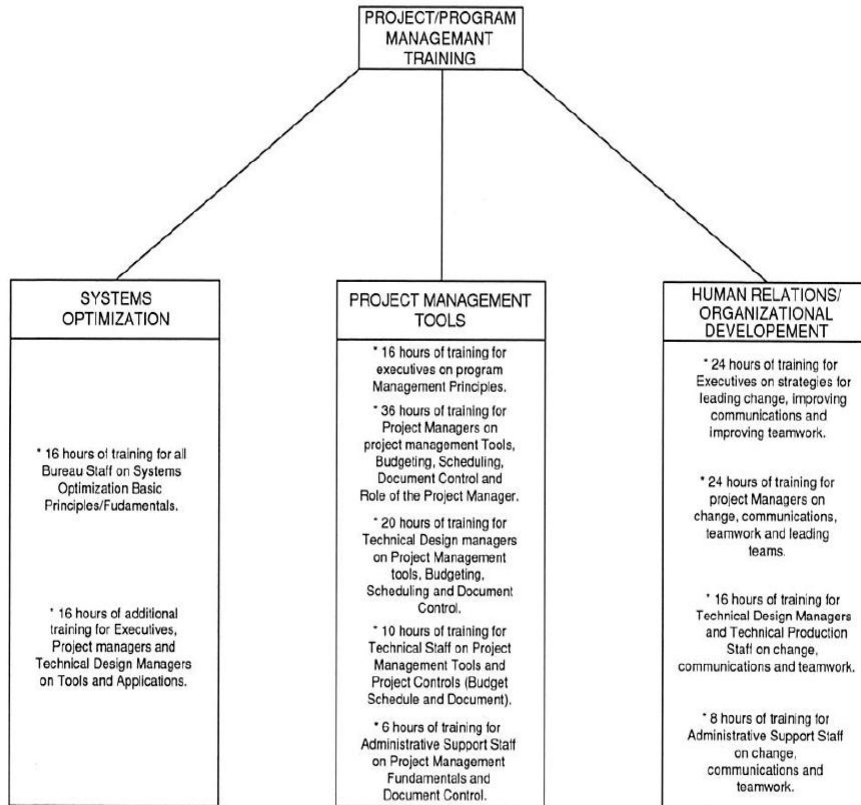
Robbins and DeCenzo (2004: 7) explain that the term “management” refers to the process of getting things done effectively and efficiently through and with other people. The evidence is clear that the discipline of PM depends entirely on the ability of leadership skills and experience to promote, provide and maintain the spirit of cohesion for team development through human resources development. In addition, the authors define skills as the ability to demonstrate a system and sequence of behaviour that is functionally related to attaining a performance goal. Garvey and Smith. (2004: 21) recommend that training should touch on work-related aspects and project management techniques. Buckley and Caple (2004: 9) identify the benefits of training as follows:

- Individual trainees in relation to their current positions may gain greater intrinsic or extrinsic job satisfaction. Essential job satisfaction may come from performing a task well and from being able to exercise a new range of skills;
- Extrinsic job satisfaction may be derived from extra earnings accrued through improved job performance and the enhancement of career and promotion prospects both within and outside the organization; and
- Emphasising the importance of training, the expected outcomes are: improved employee work performance and productivity; shorter learning time; a decrease in wastage; fewer accidents; less absenteeism; lower labour turnover; and greater customer or client satisfaction.

This finding is congruent with the view of Kuprenas (2003: 29) that the implementation of project team members’ training on project management

appears to enhance performance and also lowers the rate of defects. In addition, the author recognized a framework for project management training components. Figure 2.4 below shows the courses and hours required within each element of the training.

Figure 2.4: Project Management/Program Elements of Training



Source : (Kuprenas, 2003: 28)

Therefore, systems must be put in place for training as reflected in figure 2.4 on Project/Program Management training in systems optimization, project management tools and human relations/organizational development (Kuprenas, 2003: 28). PM, supervisors and site inspectors and all DHLG staff should be trained to dramatically improve the quality of RDP housing and their success.

Furthermore, Buckley and Caple (2004: 9) suggest that it is important to make sure that 'people' issues and implications of change are raised with, and understood by, the organizational decision makers. Buckley and Caple (2004: 13) argue that it is easy to follow and appreciate the logic which demonstrates how organizations and those individuals who work in them could benefit from well-planned and well-directed training programmes. The authors draw conclusions about the clear connection between the organization and the image of training, leading them to these remarks:

- Many who occupy senior and executive positions have publicly endorsed the claims that can be attributed to training and extol the competence and contribution of their own training departments. However, this leaves us with something of a riddle because a close examination of the staffing, function and status of training departments does not always reflect the apparent views and attitudes of organization. Another part of the riddle which impacts on training is the pressure on, and demands made of, operational departments. Some managers are faced with a dilemma when they acknowledge the value of training and recognize the need for their staff to be trained but cannot spare them time away from the job to undertake training. These premises are applicable equally to broader aspects of the construction industry and indicate that plans should be made to relate corporate strategy and build a training policy.

Rogers (2004: 178-179) describes the four criteria for effective training. These are:

- training needs analysis;
- deciding on the method of training, taking into account the cost;
- choosing the training provider with quality; and

- it may be useful to acquire training or qualifications in your own niche. The author provides solutions on the above challenges in planning and who must be trained by an organization. This can help to deepen knowledge and the credibility of emerging companies.

Marchington and Wilkinson (2005: 243-249) outline the best indicators for the ultimate level evaluation of training as follows:

- The number of customer complaints or rejects; productivity; number of accidents; rate of organization absenteeism; and proportion of letters answered within two days. The training process comprises the following steps:
 - identifying training and learning needs;
 - devising a learning plan; and
 - delivering training, and evaluating outcomes.

These authors further outline in detail the main methods of determining the above steps (Marchington and Wilkinson, 2005: 243-249).

Roux (2006: 33) defines mentoring as a process and a partnership whereby a mentor and mentee work together to discover and develop the mentee's latent abilities. The author further defines a mentor as a trusted, expert or business professional, an advisor in the organization who willingly shares knowledge based on experience, insight and wisdom. Similarly, Garvey and Smith (2004: 10) refers to mentoring as a relationship between mentor and mentee which depends on a high degree of trust and mutual regard. In addition, the author postulates that mentoring should be used as a tool to empower others in order to gain a greater understanding of the total organization and to "navigate their

way around”, develop their skills and careers, and boost confidence in applying themselves.

Brown and Botha (2005: 4) maintain that the implementation of projects should be mentored where there is a low level of knowledge of project management skills. The authors infer from their investigation into the lessons learnt from the implementation of project management in South African district municipalities. Furthermore, these authors suggest that a mentor for the designated project manager must be appointed to enhance the success rate of projects in the construction industry. Similarly, Roux (2006: 33) states that since mentors willingly share gained knowledge of the organization performance, have enhanced their roles in the organization and contributed to the future success of the organization, the project organization ends up with people who are better trained, an improved organizational culture, better leaders and retention of key skills.

Brown and Botha (2005) offer a clear list of duties and responsibilities for a project mentor:

- to act as an independent external advisor to the implementing project leader and team members on project management practices and related matters that surface during the implementation process;
- to serve as an external evaluator of the organization’s progress with the implementation of project management;
- to give expert advice to the organization, aligned with world best practices in project management; and
- to facilitate progress assessment meetings on at least a monthly basis and render pertinent guidance on matters arising.

Therefore, mentoring can help to enhance the current situation of the RDP projects, contribute to improving the quality of the projects and the future success of the profession ending with people who are better trained and the retention of skills. Furthermore, Garvey and Smith (2004: 30) states that mentoring provides a useful framework for mentoring and recommend that whatever approach or style one uses, one needs to work within a framework in order to be of most help to the mentee. In addition, the authors explain that mentoring is rapidly becoming recognized worldwide as a highly effective human resource development process.

Khalid, Marroszky and Davis (2006: 27) are of the opinion that quality remains a critical issue for the construction industry which has cost implications. In the review of literature by these authors, they cited 3.4 per cent to 6.2 per cent, as the cost of quality rectification problems. Furthermore, the authors state that other researchers have put the cost of rework as high as 12 per cent. Therefore, PM, project teams and subcontractors must ensure that projects embrace quality, in addition to the management and coordination of the work done by subcontractors.

Furthermore, the authors recommend that the gathering and analysis of information at a fundamental level in order to get to the root of the problem, by taking into account various perspectives such as the type of defects, their frequency of occurrence, cost of rectification and their origin or cause. Consequently, this type of investigation in tackling quality problems can improve the rate of non-conformance or rework in construction.

The aforementioned authors offer the following reasons why an investigation into defects on construction sites may be needed:

- It will provide the level of detail essential for the effective management of the subcontractor supply chain;
- Despite the general nature of the construction industry being the same, there are unique country-related issues that require country- specific study; and
- A large proportion of the work done by subcontractors creates the need for examining how data can be collected and used for decision-making purposes in relation to the management and coordination activities by the main contractor.

In conclusion, the authors further suggest the use and application of one of the quality tools called the 'Pareto Principle' to examine and manage subcontractor performance on construction projects. The authors believe that the 'Pareto Principle' is quite powerful and has been used widely for the following:

- To examine the nonconformities to various ISO 9001 clauses in order to determine critical quality related shortcomings on a construction project;
- To identify cost components to design more economical car parking stations; and
- To prioritise customer requirements, examining the cost of poor quality and an analysis of human errors in relation to quality.

Therefore, project managers of a well-managed project must invest in a quality management system (ISO 9001) from the beginning of the design process of the project and also integrate the QMS with other project management processes and knowledge areas. The process of quality management should include the activities of quality planning, quality assurance and quality control during every phase of the project.

Clearly, the above programmes can be useful in achieving the desired results in the discipline of project management. Therefore, it can be generally accepted that mentoring can be implemented in construction projects as a process to close the skills gaps and improve the levels of quality. The above facts from the body of research clearly indicate that the concept of mentoring can help to improve the competency and skills of emerging contractors in our country. Roux (2006: 33) defines a mentor as a trusted, expert or business professional, an advisor in the organization who willingly shares knowledge based on experience, insight and wisdom.

2.8 CONCLUSION

Chapter two through a review of existing literature provided an understanding of factors influencing the construction project success rates of RDP housing projects in Eastern Cape. An exploration followed the causes of poor service delivery, effectiveness of PM was discussed, as were the various project management principles. The review examined strategies to improve the quality of projects, cost of training and quality. Lastly, the literature review was used to support the research instrument with the intention of questioning the factors influencing the construction project success rates of RDP housing projects within selected corporate governance in the Eastern Cape.

The next chapter will focus on describing the research methods used to conduct this research on the factors influencing construction project success rates of RDP housing projects in the Eastern Cape.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The previous chapter described the literature on factors influencing the construction project success rates of RDP housing projects. It also highlighted the components of strategies to improve the quality of projects, quality control during construction, the cost of training and quality. Welmer, Kruger and Mitchell (2005: 52), as quoted by Gqamane (2010: 48), state that when one conducts research to investigate a research hypothesis or a research question, data is collected from the subjects of inquiry in order to solve the problem concerned. The results that are obtained should, therefore, shed light on the tenability of the hypothesis. Results should also give an indication of whether to accept or reject the hypothesis. A crucial element in this connection is the research methodology that the researcher intends to use.

This chapter highlights the sequential order of steps in the study; the type of research design; the target population; data collection methods; validity and reliability of the questionnaire; and data analysis.

3.2 STUDY TYPE

This research used a quantitative approach to collect data and analyse the factors influencing construction project success rates of the RDP housing projects in the Eastern Cape. Rubin and Babbie (2005: 552), as quoted by de Vos, Delpont, Fouche and Strydom (2011: 249), state that quantitative data

analysis can be regarded as a the technique by which researchers convert data to a numerical form and subject it to statistical analysis. In addition, the authors state that the advantage is to reduce data to an intelligible and interpretable form so that the relations of research problems can be studied and tested, and conclusions drawn. Creswell (2009: 4) adds that quantitative research is a means for testing objective theories by examining the relationship among variables. These variables in turn can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures. According to Hakim (2000: 34), qualitative research design is concerned with individuals' own accounts of their attitudes, motivations and behaviour. It offers richly descriptive reports of individuals' perceptions, attitudes, beliefs, views and feelings, the meanings and interpretations given to events and things, as well as their behaviour. Hence the quantitative design was used for the purpose of this study.

The researcher used in this research a case study. Saunders, Lewis and Thornnhill (2009: 141) explain that a case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence. The authors further state that the case study strategy has considerable ability to generate answers to the questions 'why?' as well as the 'what?' and 'how?' The data collection methods employed may be varied; including questionnaires, interviews, observation and documentary analysis (Saunders, Lewis and Thornnhill, 2009: 141). This study identified the causes of poor service on housing delivery; assessed strategies to improve the quality of projects; and made recommendations to enhance the success of project delivery.

3.3 TARGET POPULATION

The target population is the set of all individuals relevant to a particular study (Burt, Barber and Rigby, 2009: 259) and must be defined in terms of elements, geographical boundaries and time (Sekaran and Bougie, 2009: 267). The target population of the Department of Housing and Local Government in the Eastern Cape Province comprises of staff involved with the management of RDP housing projects. This includes Project Managers, Senior Managers, Quality Coordinators, Control Works Inspectors and Assistant Project Managers within the department. In a personal interview, the researcher asked Mr Pambo, an official (Project Manager) of the DHLGTA PM (2009), about the total structure of the RDP housing projects in the Eastern Cape.

According to Mr Pambo, the Eastern Cape has a structure to accommodate 12 Project Managers, 6 Senior Managers, 12 Quality Coordinators, 24 Assistant Project Managers and 30 Control Works Inspectors. At present, the province has a staff complement made up of 15 DHLG Project Managers, 20 Quality Control Officers, 1 Quality Coordinator, 9 Control Work Inspectors and 5 Assistant Project Managers.

3.4 SAMPLING PROCEDURE

Non-probability sampling includes purposive sampling, quota sampling, target, spatial sampling and snowball sampling (de Vos, Delpport, Fouche and Strydom, 2006: 201). Welman, Kruger and Mitchell (2005: 68) postulate that the advantage of non-probability samples is that they are less complicated and more economical, in terms of time and financial expenses, than probability sampling. The present study used a non-probability sampling technique for the survey. Purposive sampling for the focus group questionnaires was used to find out

whether or not their shared experience corroborated questionnaire data. According to de Vos et al. (2006: 202), purposive sample is based on the judgement of the researcher in that a sample is composed of elements that contain the most characteristic, representative or typical attributes of the population.

DHLG comprises of 50 staff involved with the management of RDP housing projects. The authors state that only a sample of 44 would be sufficient for the study. Saunders, Lewis and Thornnhill (2009: 210) recommend that, where possible, it is important to collect and analyse data from every case or group member to avoid generalisation. Such a technique is termed a “census”. Census methodology involves the collection and analysis of data from every possible case or group member in a population (Welman and Kruger, 2005: 101). Due to the small target population, it was more beneficial to employ a census technique to gain insight into the factors influencing the construction project success rates of RDP housing projects in the Eastern Cape. The census population of 50 respondents is presented in Table 3.1.

Table 3.1: Population

Positions	Proposed Number
DHLGTA Project Managers	15
Quality Control Officers	20
Quality Coordinator	1
Control Works Inspectors	9
Assistant Project Managers	5
TOTAL	50

3.5 DATA COLLECTION

According to Maree (2007: 156), data collection is a process that involves applying selected measuring instruments to the selected population for investigation. Similarly, de Vos et al. (2011: 171) state that quantitative data-collection methods often employ measuring instruments such as structured observation schedules; structured interviewing schedules; questionnaires; checklists; indices; and scales. The authors also state that it is essential to understand certain concepts and principles that are fundamental to measurement before choosing a specific measuring instrument. De Vos et al. (2011: 172) also concur with Saunders, Lewis and Thornhill (2009: 360) that there are so many ways in which data can be collected and that the importance of choosing and understanding the theory and values that are basic to measurement should not be underestimated. In addition, the authors state that the design of the questionnaire will affect the response rate and the reliability and validity of the data.

The researcher decided that the status of Eastern Cape RDP housing project reports were sufficiently representative for the purpose of the analysis of the study as the DHLG Project Managers, with the help of forensic investigators, had maintained a comprehensive list of defects (Table 1.1 in section 1.3). Data for this study was collected via questionnaires, which were supplemented with informal interviews with all six project managers.

3.5.1 Self-administered questionnaires

A self-administered questionnaire was used to collect data on the causes of poor project delivery; the present extent of the success/failure of project delivery; and the strategies to improve the quality of projects. The questionnaires

were also supplemented with informal interviews with the project managers. This questionnaire technique was chosen as the most appropriate tool for data collection, as the questionnaires were hand delivered to respondents (Saunders, Lewis and Thornhill, 2009: 362). As recommended by de Vos et al. (2011: 188), the respondents completed the questionnaire on their own but the researcher was available in case problems were experienced. The authors explain that the researcher (or fieldworker) limits his or her own contribution to the completion of the questionnaire to absolute minimum.

Therefore, the researcher largely remained in the background and could, at most, encourage respondents with few a words to continue with their contribution, or lead them back to the subject (Maree, 2007: 157). There are many advantages associated with questionnaires. The author states that questionnaires are inexpensive and allow a large number of respondents to be surveyed in a relatively short period of time, even if the respondents are widely distributed geographically. If the questions are closed-ended, they are easy to complete and easy to analyse. Furthermore, questionnaires allow respondents to answer questions at times that are convenient to them. Questionnaires have their drawbacks as well.

The questionnaire in this study consisted of closed-ended questions in order to facilitate completion by respondents (See Appendix B).

3.5.2 Forms of questions

In asking questions on the causes of poor project delivery, the present extent of the success/failure of project delivery and the strategies to improve the quality of projects, researchers have two options. They may ask open-ended questions or closed-ended questions. According to Bell (2005), as quoted by Maree (2007:

161), whereas open ended questions are used if a space is provided for a word, phrase or even a comment. However, analysing, this type of questions is more difficult than is the case of the closed ended question. In this study, closed-ended questions were asked. The following paragraphs discuss the option, briefly.

3.5.2.1 Construction of questionnaire

Leedy and Ormrod (2005: 192) postulate that questions should be direct, using simple clear unambiguous language, with unwarranted assumptions. Questions should not be leading and should be consistent. The authors further state that responses should be coded to keep the respondents task simple, with clear instructions giving a rationale for unclear items. Questionnaires should also look attractive and professional by addressing the needs of the researcher item by item. In the present study, all the above key points were adhered to.

3.5.2.2 Closed-ended questions

Saunders, Lewis and Thornhill (2009: 362-375) postulate that in closed-ended questions, the respondent is instructed to select an answer from a number of alternative answers provided by the researcher. In addition, the authors purport that closed-ended questions are very popular because they provide a greater uniformity of responses and are more easily processed. They are also less time-consuming for the respondent to answer. In this case, question number one in section B can be used as an example of a closed-ended question (See Appendix B). Respondents were forced to express their feelings towards an implicitly positive or negative statement.

The authors also highlight the following six types of closed-ended questions:

- List: where the respondent is offered a list of items, any of which may be selected;
- Category: where only one response can be selected from a given set of categories;
- Ranking: where the respondent is asked to place something in order;
- Rating: in which a rating device is used to record responses;
- Quantity: to which the response is a number giving the amount; and
- Matrix: where responses to two or more questions can be recorded using the same grid.

In the present study, all twenty one questions were closed-ended questions. This was done to save the time of respondents and for coding during data collection. The four point Likert - style rating scale, which ranges from strongly disagree (1), to disagree (2), to agree (3), and to strongly agree (4), closed questionnaire was used in this research. The researcher administered the questionnaire.

3.5.2.3 Pre-testing the questionnaire

The questionnaires were pre-tested to ensure that all items were clear and understandable. According to Ngulube (2005: 136), no questionnaire should be considered ready for use until it has been pre-tested. Similarly, Dawson (2009: 98) purports that a pilot study is a try-out of the questionnaire to see how it works and whether change is necessary before the start of the full-scale study, and is sent out to people who will be taking part in the main survey.

3.5.2.4 Population for the pre-test

The questionnaire was pre-tested by three professionals. Two subject experts were from the South African Council for Projects and Construction Management Profession (SACPCMP) and one from the Marketing and Economics Department. The respondents were asked to fill in the questionnaire and comment on the format and wording of the questionnaire. They were chosen because they were experts in the field of study and they had consented to participate in the pre-testing.

3.5.2.5 Pilot-test

The questionnaire was sent to the experts through email and a hardcopy was submitted to the supervisor. The respondents were given one week to complete the questionnaire. After a week, reminders were sent. Of the three questionnaires sent, all three were returned. Very few changes were made to the questionnaire after the pre-test. Some of the changes were related to spelling errors.

3.5.2.6 Administering the questionnaires

After the questionnaire were pre-tested, the researcher visited the sites and collected data after emailing the questionnaire with a covering letter to all the members of the population who had been selected to be part of the study. The letter explained the purpose of the study and requested the recipients to complete the questionnaire and return it to the researcher as soon as possible, using the addressed envelope provided for the respondent. Some of the respondents to the questionnaire chose to complete the questionnaire in the presence of the researcher in case they needed any further clarification. For all

DHLG Project Managers, the addresses were obtained from the initial visit to the staff. Emails were also sent to all members as they all had email addresses. This was done in case there were people who would have liked to complete the questionnaire online and return it to the researcher via email. The advantage of administering questionnaires by email is that email costs less in terms of time and money. One does not have to buy envelopes and stamps. Secondly, one can copy one email to many people.

3.5.2.7 Response rate

Saunders, Lewis and Thornnhill (2009: 219) indicate that the response rate is the guide to the representativeness of the respondents. In addition, the authors state that if 60 per cent of the sample were small service sector organizations then, provided that the sample was representative, one would expect 60 per cent of the population to be acceptable. A low response rate is a danger signal and anything below 50% is considered to be poor and over 90% excellent.

The response rate of the present study was high. The researcher anticipated 50 returned questionnaires. All 50 (100%) questionnaires distributed were returned. Project Managers and project team respondents received two sets of questionnaires on the same subject at almost the same time. To encourage a response, a reminder letter was sent to all recipients after two weeks, thanking those who had returned the questionnaire and asking those who had not returned the questionnaires to do so. According to Babbie and Mouton (2001: 260), receiving a follow-up letter encourages respondents to look for the original questionnaire.

3.6 ETHICAL CONCERNS

According to McMillan and Schuhmacher (2006: 142) ethics in terms of conducting research aims to protecting the rights and welfare of the subjects at the same time. Due to the nature of the research the questions, confidentiality of the participants' identity was maintained and protected. Ethical clearance was granted by the Ethics Research Committee of the Faculty of Management Sciences. Participation was voluntary. The researcher was objective and adhered to the general code of ethics for management sciences researchers. Before the completion sessions took place, the researcher briefed the participants. Durrheim and Wassenaar (1999: 67) noted that briefing involves explaining to research participants, at the beginning and conclusion of the study, the nature and purpose of the study.

3.7 VALIDITY OF THE QUESTIONNAIRE

Validity asks the question: are we measuring what we want to measure? (Muijs, 2011: 56; Lodico, Spaulding, and Voegtler, 2010: 93). McMillan and Schuhmacher (2006: 130) state that validity is a judgement of the appropriateness of a measure for specific inferences, decisions and/or consequences. In addition, these authors purport that validity is a situation-specific concept that it is dependent on the purpose, population, and a situational factors in which measurement takes.

According to Kent (2007: 141), face validity is a property of a test intended to measure something. Furthermore, Grey (2004: 135) states that validity has to do with the degree to which the scale items represent the domain of the concept under study. With this study, the questionnaires were given to at least three

experts to check, assess and rate. Any possible mistakes that evoked ambiguity in the answering of questionnaires were rectified. Content validity has to do with the degree to which the scale items represent the domain of the concept under study (Grey, 2004: 135).

Fink (2006: 31) suggests two methods to ensure validity. One way is to base it on an already-validated survey and the other way is to conduct a pilot study. In this study, a pilot study was conducted and ensured through a careful review of the of literature reviewed and appropriate prior discussion with subject experts

3.8 RELIABILITY OF THE QUESTIONNAIRES

Reliability is a matter of whether a particular technique, applied repeatedly to the same object, would yield the same result each time (Wellman and Kruger, 2005: 145). Salkind (2006: 106) explains that reliability occurs when an instrument measures the same thing more than once and results in the same outcomes. Vos et al. (2011: 177) argue that it is rare to have perfect reliability and suggest procedures to increase the reliability of measures such as increasing the number of items or observations, the elimination of items that are unclear, and the use of pre-tests and pilot studies.

The reliability of a measure is established by testing for both consistency and stability (Sekaran and Bougie, 2009: 324). In addition, the authors state that consistency indicates how well the items measuring a concept hang together as a set. The authors state that Cronbach's Alpha is computed in terms of the average inter-correlations among items measuring the concept. The closer the Cronbach's Alpha is to 1, the higher the internal consistency and reliability.

Cronbach's Alpha for this study was computed to determine the reliability of the data and was found to be 0.773, which was acceptable for internal consistency reliability (See Appendix C). Andrew, Damon, Paul and McEvoy (2011: 202) explain that Cronbach's Alpha is a popular method for measuring the internal consistency and reliability of a group of items and indicates how well the items in a set are positively correlated to one another. To determine the reliability of the questionnaire, a test-retest method was used. After an interval of two weeks, the same questionnaires were administered again to the same subjects. The coefficient of correlation was calculated and results were tested for significance.

The questionnaires were sent via e-mail to the research supervisor and with two experts in the field of project management (SACQSP and SACPCMP) for comments. Questions were framed carefully so that respondents did not view them as intrusive. The respondents were assured of anonymity and confidentiality.

3.9 DATA ANALYSIS

Once quantitative data have been collected and presented, proper data analysis and interpretation are essential (Wilemse, 2004: 39). The data was analyzed using Statistical Package for the Social Sciences (SPSS) version 15.0 (SPSS Inc., Chicago, Illinois, USA). A p value <0.05 was considered statistically significant. Dawson (2009: 115) states that the use of statistical software is the easiest and most efficient method to analysis data, as most software packages produce well-presented graphs, pie charts and tables which can be used for the final report.

This study used both descriptive and inferential statistics.

3.9.1 Descriptive statistics

According to McMillan and Schuhmacher (2006: 152), descriptive statistics are used to summarize, organize, and reduce large numbers of observations. Descriptive statistics can be divided into two types: univariate descriptive analysis and bivariate descriptive analysis. Univariate descriptive analysis is concerned with summarizing the characteristics of some phenomenon in terms of distributions on variables, whereas the bivariate descriptive analysis is concerned with describing the form and strength of associations between variables, as well as comparing the characteristics of the same variable in different populations. Lind, Marchal and Mason (2001: 6) explain that descriptive statistics describe the organizing and summarizing of quantitative data.

3.9.2 Inferential statistics

Sekaran and Bougie (2009: 319) state that, inferential statistics in a research project include several variables. Beyond knowing the descriptive statistics of the variables, one would often try to reach conclusions that extend beyond the immediate data alone, such as how one variable relates to another. Lind, Marchal and Mason (2001: 348-351) purport that inferential analysis allows the researcher to draw conclusions about populations from the sample data.

3.9.2.1 Pearson Correlation

According to Willemse (2004: 85), correlation analysis is used to describe the degree of strength by which one variable is related to another. A correlation is a number between -1 and +1 that measures the degree of association between two variables (call them X and Y). A positive value for the correlation implies a

positive association (large values of X tend to be associated with large values of Y and small values of X tend to be associated with small values of Y). A negative value for the correlation implies a negative or inverse association (large values of X tend to be associated with small values of Y and vice versa) (Sekaran and Bougie, 2009: 322).

Correlation was computed to determine the linear relationships between the dimensions (See Table 4.6).

3.9.2.2 Anova

Sekaran and Bougie (2009: 358) postulate that the name “analysis of variance” comes from the way the procedure uses variance to determine whether the means are different. The parametric Anova and non-parametric Kruskal-Wallis Anova test were computed to determine differences in means between categories of age, experience and qualification. The results of both the parametric Anova and Kruskal-Wallis Anova reflected no difference between the age groups, experience and qualification at the 95% level ($p>0.05$) (See Appendix D).

3.10 CONCLUSION

To achieve the objectives of the study and to gain knowledge about the research problem, this chapter explained the choice of research methods used. The first aspect addressed in the research methodology was the research design. This chapter also focused on the population for the study, data collection method, the method for questionnaire construction, pre-testing the survey, response rate, ethical concerns, as was the data analysis method. It also highlighted the

reliability and validity of the study. Thereafter, the research methodology discussed the various statistical tools that were used in this study.

The following chapter will present and interpret the findings of the questionnaire in a meaningful manner using statistical tools. In other words, statistical analysis is undertaken to make sense of what has been collected so that the researcher can obtain information that will eventually lead to the knowledge that he/she had planned to gain in the first place (Fox and Bayat, 2007).

CHAPTER FOUR

DISCUSSION AND INTERPRETATION OF RESULTS

4.1 INTRODUCTION

The objective of this study was to investigate the factors influencing the quality of construction project success rates of RDP housing projects. This chapter deals with the presentation, analysis and discussion of the raw data collected from questionnaires which were administered to the Department of Housing and Local Government Project Managers, Quality Coordinator, Quality Officers, Control Works Inspectors and Assistant Project Managers.

4.2 OBJECTIVES OF THE STUDY

The objectives of the research were to:

- Identify the causes of poor service delivery in housing projects;
- Determine the effectiveness of project management principles and practices;
- Assess the strategies to improve the quality of projects; and
- Make recommendations to develop a framework to enhance the successful delivery of construction projects in the Eastern Cape.

4.3 DESCRIPTIVE STATISTICS

The description of the study was used to ascertain the profile of the sample, responses to the questions relating to causes of poor service on housing, the

effectiveness of project management, strategies to improve quality, as well as measures of central tendency and dispersion and inter-correlations among the dimensions.

4.2.1 Profile of the sample

In Table 4.1 below, information was collected on four demographic factors, namely gender, age, experience and qualification. This information/data categorised into sample size and percentages. Gender was investigated to find out whether the selection of contractors conformed to the government’s gender equity policy. Experience and qualification impact on quality delivery, hence their inclusion.

Table 4.1: Profile of the sample

		N	%
Gender	Male	29	56.9%
	Female	22	43.1%
Age	17-25	12	23.5%
	30-38	30	58.8%
	40+	9	17.6%
Experience	Up to 2 years	8	15.7%
	2-5 years	21	41.2%
	5-15 years	22	43.1%
Qualification	ND	25	49.0%
	BTech	14	27.5%
	BSc & Other	12	23.5%

The following graphs illustrate the four dimensions of table 3 above.

Figure 4.1 Composition of Sample: Gender

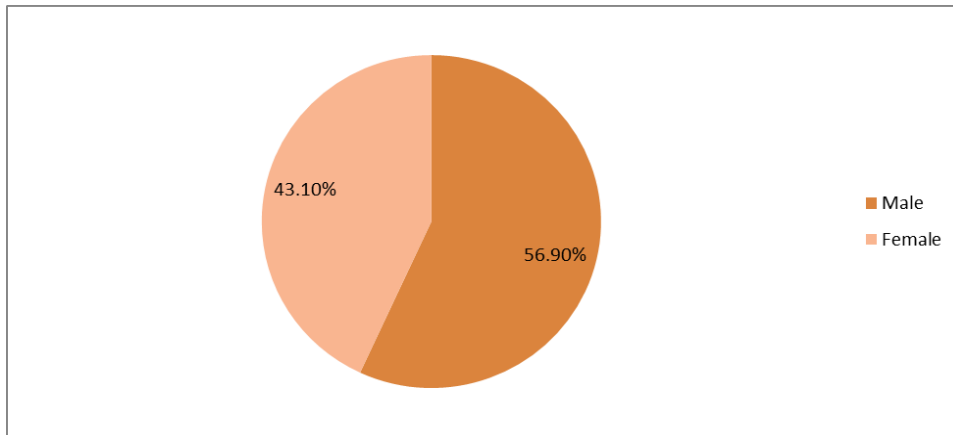
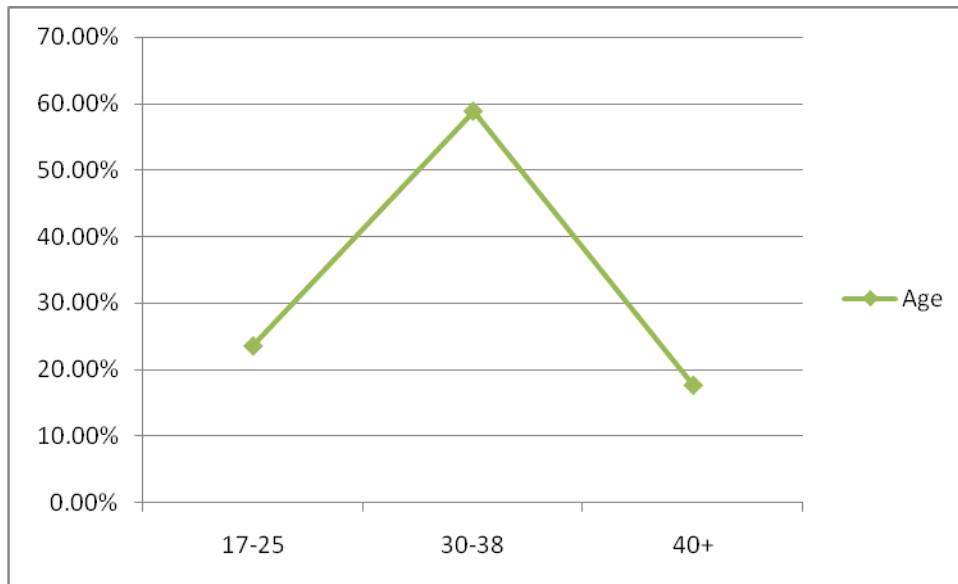


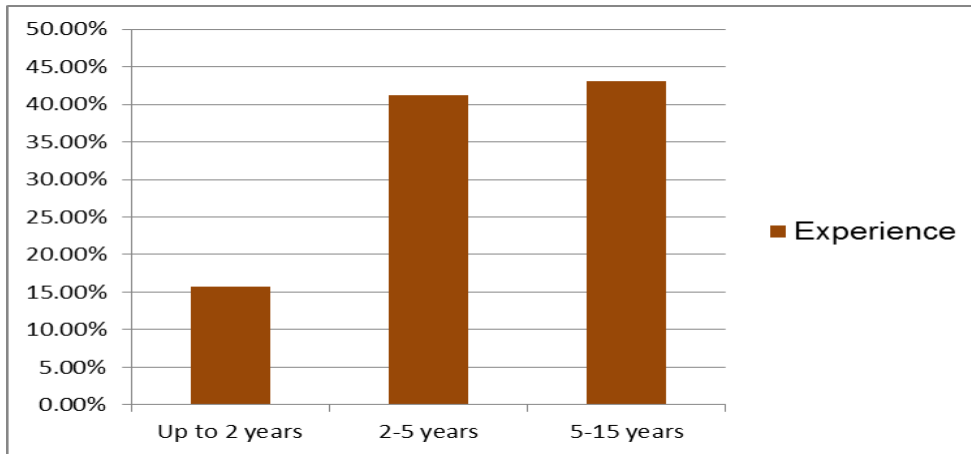
Figure 4.1 reflects that of the 50 respondents, the majority were males. 56.9 percent were male and 43.1 percent were females.

Figure 4.2 Composition of Sample: Age



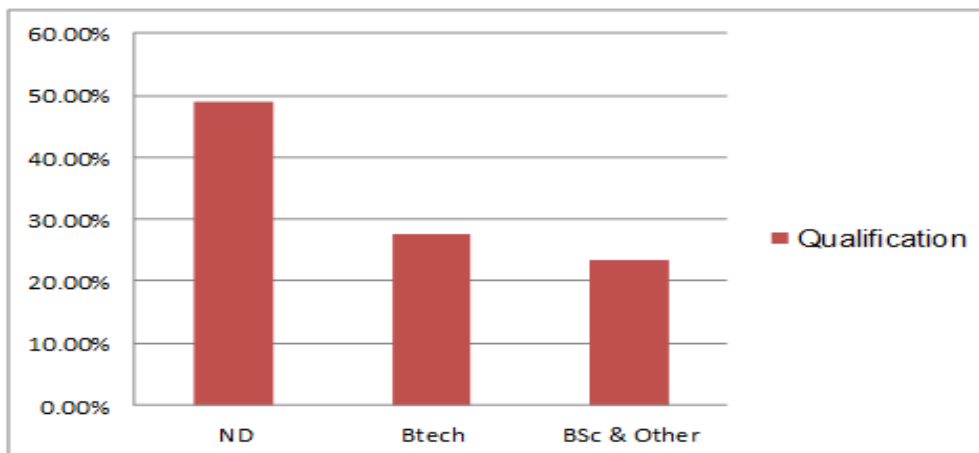
In terms of age, figure 4.2 illustrates that (23.5%)of the total sample form the 17-25 age group; 58.8% were between 30-38 years; and 17.6% were in the 40+ age group.

Figure 4.3 Composition of Sample: Length of Employment



In terms of experience, in figure 4.3, the majority had five to fifteen years of experience (43.1 percent), followed by two to five years of experience (41.2 percent), while 15.7 percent had zero to two years of experience.

Figure 4.4 Composition of Sample: Qualification



In relation to qualifications, figure 4.4 shows that the majority of the respondents had a National Diploma (49 percent); followed by those who had a BTech (14 percent); with the remaining respondents (23.5 percent) having a BSc qualification in other fields. The finding of the questionnaire highlights the deficiency of competent technologists and engineers in charge of RDP housing projects to ensure that the project goals and objectives are met. Levy (2007: 113) identifies a lack of communication and technical competence as causes of rework. The finding of the questionnaire agrees with Levy as the respondents indicate that there is a lack of technical competence by contractors.

4.2.2 Responses to questions relating to the causes of poor service on housing delivery

The responses to causes relating to poor service on housing are shown in Table 4.2

Table 4.2: Frequencies and percentages of responses

	Strongly disagree		Disagree		Agree		Strongly agree	
	N	%	N	%	n	%	n	%
B1	0	.0%	8	15.7%	25	49.0%	18	35.3%
B2	0	.0%	2	3.9%	21	41.2%	28	54.9%
B3	6	11.8%	20	39.2%	18	35.3%	7	13.7%
B4	2	3.9%	18	35.3%	26	51.0%	5	9.8%
B5	1	2.0%	16	31.4%	27	52.9%	7	13.7%
B6	0	.0%	6	11.8%	26	51.0%	19	37.3%
B7	12	23.5%	25	49.0%	12	23.5%	2	3.9%
B8	2	3.9%	9	17.6%	28	54.9%	12	23.5%

4.2.2.1 Results by division for problems' category (Q1/B1)

Table 4.2 shows the causes of poor service delivery facing RDP projects. The majority of the respondents (49 percent) agreed that problems related to RDP projects were caused by contractors using unskilled labour. A number of the respondents (35.3 percent) strongly agreed with the above statement that the challenges facing RDP housing projects were due to the use of unskilled labour. The remainder of respondents (15.7 percent) disagreed. The finding of the questionnaire indicates that most respondents strongly agreed/agreed (84.3 percent) that problems related to RDP projects were caused by contractors using unskilled labour. This finding implies that the skills of project teams require attention. The finding concurred with van Zyl's (2004: 19) that government supports the practice whereby contractors employ labour, whether skilled or not.

4.2.2.2 Results by division for defect category (Q2/B2)

A total of 4 percent of respondents agreed that millions of rands were spent by government on repairs for defective workmanship. A large number of respondents (54.9 percent) strongly supported the statement (B2) that millions of rands were spent by government on repairs for defective workmanship. About 3.9 percent disagreed that millions of rands were spent by government on repairs. 96.1 percent of the identified respondents strongly agreed/agreed that millions of rands were spent by government on defective workmanship. This finding indicates that both project managers and project teams felt that government wasted millions on repair work. According to Wait (2005: 20), 10 – 15% of the contract value is spent on the direct costs associated with rework in the construction industry. The results are congruent with the literature that the costs of the contract value were spent by government on the direct costs associated with repairs due to substandard work rendered by contractors.

4.2.2.3 Results by division for information category (Q3/B3)

In response to B3 that project failure is characterised by deficiency in design documents, 35.3 percent agreed and only 13.7 percent strongly agreed. Approximately 39.2 percent of the respondents disagreed that the deficiency in design documents contributes to poor quality of RDP housing projects, while 11.8 percent of the respondents strongly disagreed. Analysis shows that about 49 percent of the respondents strongly agreed/agreed that incorrect documents were provided for the construction of RDP projects, while a large number of respondents (51 percent) strongly disagreed/disagreed. The results show that efficient design documentation was provided, while 49 percent of respondents indicated insufficiency. Wait (2005: 19) states that the primary sources of rework in construction is the documentation on which the construction activity is based. The findings of the questionnaires disagreed with the view of Wait (2005) as the majority of respondents (51 percent) strongly disagreed/disagreed that project failure is characterised by deficiency in design documents.

4.2.2.4 Results by division for communication category (Q4/B4)

Fifty one percent of the respondents agreed that there is a lack of communication with project teams, 9.8 percent strongly agreed that a lack of communication with project teams result in poor quality. 35.3 percent of the respondents disagreed, and only 3.9 percent strongly disagreed. A large number of respondents (60.8 percent) strongly agreed/agreed that a lack of communication amongst project teams resulted in poor quality and only 39.2 percent strongly disagreed/disagreed. This finding indicates that communication was lacking amongst project teams. In section 2.4, Levy (2007: 113) identifies the lack of communication as one of the causes of poor quality. The findings of these questionnaires concurred with the Levy as the majority of the respondents

(60.8percent) claim that there was a lack of communication amongst project teams.

4.2.2.5 Results by division for processes category (Q5/B5)

The majority of respondents (52.9 percent) agreed that the process or activities of projects are incorrectly implemented (B5), supported by 13.7 percent who strongly agreed. About 31.4 percent of the respondents disagreed that the process or activities of RDP housing projects are incorrectly implemented, while only 2 percent of the respondents strongly disagreed. The majority of respondents (66.2 percent) strongly agreed/agreed that the process or activities of projects are incorrectly implemented, while only 33.4 percent of the respondents strongly disagreed/disagreed. The analysis indicates that a large number of respondents (66.2 percent) at DHLG were in agreement that the causes of poor service delivery lie within incorrectly implemented processes or activities. According to Wait (2005: 19), rework is the unnecessary effort of redoing a process or activity that was incorrectly implemented in the first place. The findings of the study agreed with the literature that the process or activities of projects were incorrectly implemented.

4.2.2.6 Results by division for proficiency category (Q6/B6)

A large number of respondents (51 percent) agreed that there is a lack of technical competence by contractors. 37.3 percent of respondents strongly agreed that there is a lack of technical competence. Only 11.8 percent disagreed with the above view. The majority of respondents (88.3 percent) strongly agreed/agreed that there is a lack of technical competence by contractors. Analysis shows that a significant lack of technical competence by contractors was not acceptable. In section 2.2, Levy (2007: 113) identifies a lack

of communication and technical competence as causes of rework. The findings of these questionnaires agreed with Levy as the majority of the respondents (88.3 percent) claim that there was a lack of technical competence.

4.2.2.7 Results by division for proficiency category (Q7/B7)

About 23.5 percent of the respondents agreed that incorrect documents are provided for the construction of projects and only 3.9 percent strongly agreed with this view. A large number of respondents (49 percent) disagreed that incorrect documents were provided, supported by 23.5 percent of respondents who strongly disagreed. A large number of respondents (72.5 percent) strongly disagreed/disagreed that incorrect documents were provided for the construction of projects, while only 27.4 percent strongly agreed/agreed. This finding indicates that a minimal amount of incorrect documents impact on poor service delivery of housing projects. The findings of the questionnaires disagree with Wait (2005: 19) that the primary sources of rework in construction are the documentation on which the construction activity is based.

4.2.2.8 Results by division for project plan category (Q8/B8)

Many of the respondents (54.9 percent) agreed with the fact that each project is properly planned, while 23.5 percent strongly agreed, 3.9 percent of the respondents disagreed and 17.6 percent strongly disagreed. A large number of respondents (78.4 percent) strongly agreed/agreed that each project was properly planned, while only 21.5 percent strongly disagreed/disagreed. This finding indicates that each project is properly planned, while only 21.5 percent of respondents had a negative view on project plan management. According to Cicmil (1997: 392), the principal sources of project failure, are poor planning and assessment of project progress planning. The finding of the questionnaire

disagreed with Cicmil as the majority of respondents (78.4 percent) strongly agreed/agreed that poor planning was not the cause of project failure.

4.2.3 Responses to questions relating to the effectiveness of project management

The responses relating to the effectiveness of project management are shown in Table 4.3

Table 4.3: Frequencies and percentages of responses

	Strongly disagree		Disagree		Agree		Strongly agree	
	N	%	N	%	N	%	n	%
B9	2	3.9%	10	19.6%	30	58.8%	9	17.6%
B10	5	9.8%	11	21.6%	22	43.1%	13	25.5%

4.2.3.1 Results by division for project scope category (Q9/B9)

A large number of respondents (58.8 percent) agreed that, primarily, projects define the overall scope, 17.6 percent of the respondents strongly agreed, 19.6 percent disagreed, and 3.9 percent strongly disagreed. Many of the respondents (76.4 percent) strongly agreed/agreed that, primarily, projects define the overall scope and only 23.5 strongly disagreed/disagreed. Results show that project leaders provide a clear definition of the project scope and the majority of the respondents (76.4 percent) are in agreement.

Box and Platts (2006: 378) provide a useful model to guide project leaders in creating and maintaining project alignment in order to increase their chance of success, which includes the clear definition of the project scope. In section 2.6, these authors further state that it is widely accepted that an effective team requires a clear charter. Complementing Box and Platts’s view, the PMBOK

(2008: 38) lists project scope management as one area of project integration for successful project management. Inadequate project scope definition, which is not discussed and signed-off by all stakeholders, can contribute to frustration, the misuse of resources and changes in overall time completion (Box and Platts, 2006: 378). The findings of the study are in agreement with Box and Platts's as 76.4 percent of the respondents strongly agreed/agreed that, primarily, projects define the overall scope.

4.2.3.2 Results by division for project plan category (Q10/B10)

A large number of respondents (43.1 percent) agreed that all projects have a plan and clear definition, 25.5 percent strongly agreed, 21.6 percent disagreed and 9.8 percent strongly disagreed. The majority of respondents (68.6 percent) strongly agreed/agreed that all projects have a plan and clear definition, while only 31.4 percent of the respondents strongly disagreed/disagreed. The analysis shows that all projects have a plan and clear definition as a large number of respondents (68.6 percent) strongly agreed/agreed, while 31.4 percent strongly disagreed/disagreed. Brown and Botha (2005: 4) believe that developing comprehensive planning systems would ensure delivery of successful projects. This finding is confirmed by Krause (2006: 11) who states that evaluation of project failures shows that 30% of failures are caused by inadequate planning. Box and Platts, (2006: 378) purport that without a detailed, written plan shared with all participants, a project is susceptible to differences between the expectations of project team members and stakeholders.

Therefore, a project plan must be well communicated and every team member needs a summary of the overall project goals, their role and task assignments and a list of functions on the project. The finding of the questionnaires is in agreement with the view of Brown and Botha (2005: 2) that project success is

dependent on proper planning, executive management support, completed on time and budget, with all features and functions as specified.

4.2.4 Responses to questions relating to strategies to improve quality

The responses relating to strategies to improve the quality of projects are shown in Table 4.4.

Table 4.4: Frequencies and percentages of responses

	Strongly disagree		Disagree		Agree		Strongly agree	
	N	%	n	%	N	%	N	%
B11	2	3.9%	6	11.8%	29	56.9%	14	27.5%
B12	1	2.0%	5	9.8%	29	56.9%	16	31.4%
B13	1	2.0%	8	15.7%	31	60.8%	11	21.6%
B14	4	7.8%	6	11.8%	27	52.9%	14	27.5%
B15	1	2.0%	12	23.5%	26	51.0%	12	23.5%
B16	4	7.8%	17	33.3%	22	43.1%	8	15.7%
B17	2	3.9%	15	29.4%	26	51.0%	8	15.7%
B18	1	2.0%	7	13.7%	23	45.1%	20	39.2%
B19	2	3.9%	3	5.9%	25	49.0%	21	41.2%
B20	1	2.0%	11	21.6%	25	49.0%	14	27.5%
B21	4	7.8%	12	23.5%	24	47.1%	11	21.6%

4.2.4.1 Results by division for strategies to improve quality category (Q11/B11)

A total of 56.9 percent of respondents agreed that projects were strategically aligned to improve quality, 27.5 percent respondents strongly agreed, 11.8 percent disagreed and only 3.9 percent strongly disagreed. The majority of respondents (84.4 percent) strongly agreed/agreed that projects were strategically aligned to improve quality, while 15.7 percent strongly disagreed/disagreed. This finding indicates that projects were strategically aligned to improve quality. In section 2.5, Stanleigh (2006: 2) identifies four

basic strategies that can be used to improve the quality of projects and the understanding of different crises for projects. The findings of the study are in agreement with the literature as 84.4 percent of the project team members strongly agreed/agreed that projects were strategically aligned to improve quality.

4.2.4.2 Results by division for environment to improve quality category (Q12/B12)

A large number of respondents (56.9 percent) agreed that the project management environment supports the culture to improve quality. A total of 31.4 percent of respondents strongly agreed, 9.8 percent disagreed and 2 percent strongly disagreed. The majority of respondents (88.3 percent) strongly agreed/agreed that the project management environment supports the culture to improve quality, while only 11.7 percent of respondents strongly disagreed/disagreed. The finding indicates that the project management environment supports the culture to improve quality. Ngowi (2001: 10), as quoted by Joubert, Cruywagen and Basson (2005: 32), states that society in South Africa tends to be fatalistic rather than deterministic. Due to their fatalistic nature, workers do not take responsibility for their own actions as dictated by TQM principles and tend to believe that all responsibility rests with management. The findings of the questionnaire disagree with the authors, as 88.3 percent of the respondents strongly agreed/agreed that the project management environment support the culture to improve quality.

4.2.4.3 Results by division for best practices quality category (Q13/B13)

The majority of respondents (60.8 percent) agreed that strategic project management best practices were implemented to improve quality, 21.6 percent strongly agreed, 15.7 percent disagreed and 2 percent strongly disagreed. A large number of respondents (82.4 percent) strongly agreed/agreed that strategic project management best practices were implemented to improve quality, while 17.7 percent strongly disagreed/disagreed. Complementing Stanleigh's view, Khalid, Marosszeky and Davis (2006: 34) provide a decision support tool for the long-term management of the subcontractor supply chain for achieving better quality in the construction industry, namely: Pareto Principle including ISO 9000. The findings of the study are in agreement with the literature as a large number of respondents (82.4 percent) strongly agreed/agreed that strategic project management best practices were implemented to improve quality.

4.2.4.4 Results by division for meetings attendance category (Q14/B14)

Many of the respondents (52.9 percent) agreed that all stakeholders are in attendance at relevant meetings to contribute their ideas, 27.5 percent strongly agreed, 11.8 percent disagreed 7.8 percent strongly disagreed. The majority of respondents (80.4 percent) strongly agreed/agreed that all stakeholders are in attendance, while only 19.6 percent strongly disagreed/disagreed. The analysis shows that all stakeholders were in attendance at relevant meetings to contribute their ideas as a large number of respondents (80.4 percent) strongly agreed/agreed, while 19.6 percent strongly disagreed/disagreed.

The Project Alignment Model is shown in Figure 1. It has three sections: environment, leadership and management. The internal and external business

environments must be understood when setting up a project, and they must be monitored throughout the project's life (Box and Platts, 2006: 347). Therefore, project leadership needs to involve all stakeholders in a series of meetings or workshops that jointly define the project's vision and objectives. The findings of the study are in agreement with the literature as 80.4 percent of respondents strongly agreed/agreed that all stakeholders are in attendance at relevant meetings to contribute their ideas.

4.2.4.5 Results by division for quality control category (Q15/B15)

The majority of respondents (51.0 percent) agreed that a strategic project measurement system was implemented to improve quality, 23.5 percent strongly agreed, 23.5 percent disagreed, with a small number of respondents, (2.0 percent) who strongly disagreed. A large number of respondents (74.5 percent) strongly agreed/agreed that a strategic project measurement system was implemented to improve quality, while 25.5 percent strongly disagreed/disagreed. Results indicate that a strategic project measurement system is implemented to improve the quality of RDP housing projects as the majority of respondents (74.5 percent) strongly agreed/agreed. According to Burk(2010: 278) quality control is the process of monitoring specific project results and determining if they comply with the relevant quality standards by identifying ways to eliminate causes of non-conformance results by inspection process. The finding of the questionnaires is in agreement with the view of Burke (2010: 278) that a strategic project measurement system was implemented to improve quality as 74.5 percent of respondents strongly agreed/agreed.

4.2.4.6 Results by division for site management category (Q16/B16)

Regarding insufficient time being devoted to quality site management, 43.1 percent of the respondents agreed with the statement, 15.7 percent strongly agreed, 33.3 percent disagreed and 7.8 percent strongly disagreed. A large number of respondents (58.8 percent) strongly agreed/agreed that insufficient time was devoted to quality site management, while 41.1 percent strongly disagreed/disagreed. This finding indicates that a minimal amount of time is devoted to quality site management. The findings of the questionnaires agreed with Burke (2010: 270) that a lack of monitoring specific project results to determine if they comply with relevant quality standard leads to the continuous rectification of defective work.

4.2.4.7 Results by division for client involvement category (Q17/B17)

The majority of respondents (51.0 percent) agreed that a lack of client involvement in the project hinders quality achievements, 15.7 percent of respondents strongly agreed, 29.4 percent disagreed and 3.9 percent strongly disagreed. 66.7 percent of respondents strongly agreed/agreed that a lack of customer involvement in the project hinders quality achievements, while 33.3 percent strongly disagreed/disagreed. This finding indicates that project leadership did not inadequately involve customers in the process from inception through to construction. Atkinson, Crawford and Ward (2006: 688) believe that a lack of client involvement in the project hinders quality achievements. This is confirmed by Oakland and Morosszeky (2006: 98) who state that construction projects should involve the customer in the process from design through to construction. The findings of the present study agreed with the authors as 66.7 percent of respondents strongly agreed/agreed that a lack of client involvement in the project hinders quality achievements.

4.2.4.8 Results by division for successful project category (Q18/B18)

A total of 45.1 percent of the respondents agreed that projects are deemed successful if they are completed within specified time limits, 39.2 percent strongly agreed with this view, 13.7 percent and 2 percent of the respondents, respectively, strongly disagreed/disagreed. The majority of respondents (84.3 percent) strongly agreed/agreed that projects are deemed successful if they are completed within specified time limits, while only 15.7 percent strongly disagreed/disagreed. Results indicate that projects were deemed successful if they were completed within specified time limits as the majority of respondents (84.3 percent) strongly agreed/agreed. The finding of the questionnaires disagreed with the view of Brown and Botha (2005: 2) that project success is dependent on proper planning, executive management support, completed on time and budget, with all features and functions as specified, as only the time factor was confirmed by respondents.

4.2.4.9 Results by division for successful project category (Q19/B19)

Regarding the responses to the question that a project is deemed successful if it solves the problem it was intended to within budgets limits, 49.0 percent of the respondents agreed, 41.2 percent strongly agreed, 5.9 percent disagreed and 2.0 percent strongly disagreed. A significant number (90.2 percent) of respondents strongly agreed/agreed that a project is deemed successful if it solves the problem it was intended to within budgets limits. Only 7.9 percent strongly disagreed/disagreed. This finding indicates that a project was deemed successful if it solves the problem it was intended to within budgets limits. According to Brown and Botha (2005: 2), project success is dependent on proper planning, executive management support, time completion and budget

limits, with all features and functions as specified. The finding of the questionnaires disagreed with the literature review.

4.2.4.10 Results by division for executive support category (Q20/B20)

Many of the respondents (49.0 percent) agreed that executive management gave its full support towards the implementation of projects, 27.5 percent strongly agreed, 21.6 percent disagreed and 2.0 percent strongly disagreed. A large number of respondents (76.5 percent) strongly agreed/agreed that executive management gave its full support towards the implementation of projects, while 23.6 percent strongly disagreed/disagreed. The results indicate that the executive gave adequate support towards the implementation of projects. Noble (2009: 41) purports that executive management should provide its full support towards the implementation of projects through providing physical resources that ample and appropriate for the needs of the project. The finding of the questionnaires agreed with the view of Noble as 76.5 percent of respondents strongly agreed/agreed.

4.2.4.11 Results by division for lessons from previous projects' category (Q21/B21)

Many of the respondents (47.1 percent) agreed that lessons learned from close-out meetings were archived for purposes of future projects, 21.6 percent strongly agreed, 23.5 percent disagreed and 7.8 percent strongly disagreed. A large number of respondents (68.7 percent) strongly agreed that lessons learned from close-out meetings are archived for purposes of future projects, while only 31.3 percent strongly disagreed. The study shows that lessons learned from close-out meetings were archived for purposes of future projects. According to Stanleigh (2006: 2), the project management office (PMO) must

hold a formal “Project Close – out Meeting” as soon as possible after a project is completed and lessons learned from the meeting are archived for the purpose of future projects. The finding of the questionnaires concurred with the literature review, as 68.7 percent of respondents strongly agreed/agreed.

4.2.5 Measures of central tendency and dispersion

The measures of central tendency and dispersion are shown in Table 4.5.

Table 4.5: Mean, standard deviation, minimum and maximum scores for the study variables

VARIABLES	N	Minimum	Maximum	Mean	Std. Deviation
Cause of poor service in housing projects	51	2.25	4.00	2.8725	.33306
Effectiveness of PM	51	1.00	4.00	2.8725	.64686
Strategies to improve quality	51	1.91	4.00	3.0018	.42698

The mean scores of the causes of poor service delivery indicate that respondents agree with the causes of poor service delivery. The standard deviations show a slight variation in the responses.

On the effectiveness of project management, the mean scores show that respondents agree that project management is effective. The standard deviation reveals a wide variation in responses. Some subjects strongly disagree that project management is effective, while others strongly disagree.

The mean scores of strategies to improve quality show that respondents agree that there are strategies to improve quality. The standard deviation indicates some variation in the responses.

4.3 INFERENCE STATISTICS

The Pearson’s correlation matrix showed no significant difference between the biographic variables and the study variables in Table 4.6 below. The results of the statistics are in Appendix C.

4.3.1 Inter-correlations among the study dimension

The inter-correlations among the study dimensions are shown in Table 4.6 below.

Table 4.6: Pearson’s correlation matrix

		Poor service delivery	Effective PM	Strategies to improve quality
Causes of poor service delivery	Pearson Correlation	1	.068	.321**
	p		.635	.022'
	N	51'	51'	51'
Effectiveness of PM	Pearson Correlation	.068	1	.541***
	p	.635		.000'
	N	51'	51'	51'
Strategies to improve quality	Pearson Correlation	.321*	.541**	1
	p	0.022	.000	
	N	51'	51'	51'

* Correlation is significant at the 0.05 level (2-tailed),

** Correlation is significant at the 0.01 level (2-tailed).

The correlation between the causes of poor service delivery and the strategies to improve quality is 0.321. This coefficient shows that there is a fairly weak but positive relationship between the causes of poor service delivery and the strategies to improve quality and this correlation is greater than 0.05. This correlation coefficient is, therefore, statistically significant.

The correlation between effective PM and the strategies to improve quality is 0.541. This coefficient shows that there is a moderate but positive relationship

between effective PM projects and the strategies to improve quality. This correlation is greater than 0.01. This correlation coefficient is, therefore, statistically significant.

4.4 CONCLUSION

Chapter four presented the results of the study, which investigated the factors influencing the quality of construction project success rates of RDP housing projects in the Eastern Cape. The results of the study have sufficiently met the research objectives of the study. Questionnaire results presented the causes relating to poor service delivery, the effectiveness of project management and strategies to improve the quality of projects. Results of the focus groups were discussed.

It is evident that most respondents at DHLG were involved in RDP housing projects and they had no understanding of the term “Project success”. The respondents agreed with the questionnaires on the causes of poor service delivery. On the effectiveness of project management, the respondents agreed that project management was effective. In relation to quality improvement strategies, respondents agreed that there were relevant strategies in place.

The following chapter will present conclusions and the recommendations of the study.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

Chapter four presented, analysed and discussed the data from the questionnaires. This chapter presents a summary of the findings, recommendations to improve the quality of construction project success rates and for further studies, and conclusions based on the analysis of the data and an interpretation of the results.

5.2 CONCLUSIONS

The following section presents the conclusions in relation to the achievement of objectives.

5.2.1 Findings from the literature

The findings of the literature are based on the objectives which are outlined below.

5.2.1.1 Objective one sought to identify the causes of poor service delivery in housing.

The literature review provided an understanding that problems related to the poor quality of RDP housing projects are caused by contractors using unskilled

labour; the lack of technical competence by contractors; process or activities of projects are incorrectly implemented; and a lack of communication amongst project teams (Levy, 2007: 110). Burke (2010: 270) states that a lack of monitoring specific project results to determine if they comply with relevant quality standards leads to continuous rectification of defective work. Therefore, the first objective has been achieved.

5.2.1.2 The second objective was to determine the effectiveness of project management.

One of the most significant findings arising from the research confirms the model of Box and Platts (2006: 378) which provide a useful application to guide project leaders in creating and maintaining project alignment in order to increase their chance of success, which includes the clear definition of the project scope. The authors state that effective project management can be regarded as the adherence to the ingredients of the Project Alignment Model (Figure: 2 1). These include understanding the business environment, creating a shared vision and purpose, establishing project identity, sharing responsibility and demonstrating commitment as well as the PMBOK principles.

According to Brown and Botha (2005: 2), project success is dependent on proper planning, executive management support, time completion and budget limits, with all features and functions as specified. In addition, Noble (2009: 41) purports that executive management should provide its full support towards the implementation of projects through physical the provision of resources that are ample and appropriate for the needs of the project. Therefore, the second objective has been achieved.

5.2.1.3 The third objective sought to assess strategies to improve the quality of projects.

The literature suggests four basic strategies that can be used to improve the quality of projects and the understanding of different crises for projects, projects are strategically aligned, strategic project management best practices and strategic project measurement systems are implemented, and create a culture that supports a project management environment (Stanleigh, 2006: 2).

Furthermore, Burke (2010: 278) states that a strategic project measurement system should be implemented to improve quality, all stakeholders should be in attendance at relevant meetings and sufficient time must be devoted to quality site management and client involvement in the project. Khalid, Marosszeky and Davis (2006: 34) provided a decision support tool for the long-term management of the subcontractor supply chain for achieving better quality in construction industry, namely: Pareto Principle including ISO 9000. Therefore, this objective has been achieved.

5.2.2 Findings from the empirical study

The findings of the study are based on the objectives which are outlined below.

5.2.2.1 The causes of poor service delivery in housing projects

In this study, the majority of the respondents strongly agreed/agreed (84.3 percent) that problems related to RDP projects were caused by contractors using unskilled labour. Consequently, the use of unskilled labour yields defects that require repairs by government. As a result, it seems like government

supports unskilled labour as 96.1 percent of the respondents strongly agreed/agreed that millions of rands are spent by government for repairs to defective workmanship.

The majority of respondents (88.3 percent) strongly agreed/agreed that there is a lack of technical competence by contractors, 60.8 percent of respondents strongly agreed/agreed that a lack of communication amongst project teams resulted in poor quality and only 39.2 strongly disagreed/disagreed.

The majority of respondents (66.2 percent) strongly agreed/agreed that the process or activities of projects are incorrectly implemented, while only 33.4 percent of the respondents strongly disagreed/disagreed.

A large number of respondents (72.5 percent) strongly disagreed/disagreed that incorrect documents were provided for the construction of projects, while only 27.4 percent strongly agreed/agreed.

A large number of respondents (78.4 percent) strongly agreed/agreed that each project was properly planned, while only 21.5 percent strongly disagreed/disagreed.

5.2.2 2 Effectiveness of project management

In this study, many of the respondents (76.4 percent) strongly agreed/agreed that, primarily, projects define the overall scope and only 23.5 strongly disagreed/disagreed.

The majority of respondents (68.6 percent) strongly agreed/agreed that all projects have a plan and clear definition, while only 31.4 percent of the respondents strongly disagreed/disagreed.

5.2.2.3 Strategies to improve the quality of projects

In this study, the average percentage of respondents (82.4 percent) strongly agreed/agreed that QMS/best practices are implemented; projects are strategically aligned to improve quality; and strategic project management best practices and strategic project measurement systems are implemented to improve quality.

Furthermore, a large number of respondents (80.4 percent) strongly agreed/agreed that all stakeholders are in attendance at relevant meetings to contribute their ideas, while 19.6 percent strongly disagreed/disagreed.

A large number of respondents (58.8 percent) strongly agreed/agreed that insufficient time was devoted to quality site management, while 41.1 percent strongly disagreed/disagreed. This finding signals that quality site monitoring with respect to quality control is either not properly conducted or if it is conducted in such a manner, it is not effective.

In this study, 66.7 percent of respondents strongly agreed/agreed that a lack of customer involvement in the project hinders quality achievements, while 33.3 percent strongly disagreed/disagreed. These findings signal that customer involvement is either not implemented or, if it is being implemented, it is not effectively communicated.

In this study, the average percentage of respondents (87.25 percent) strongly agreed/agreed that projects are deemed successful if they are completed within

specified time limits, while only 15.7 percent strongly disagreed/disagreed and 90.2 percent of respondents strongly agreed/agreed that a project is deemed successful if it solves the problem it was intended to within budget limits, while only 7.9 percent strongly disagreed/disagreed. This finding signals that projects are successful when completed within specified time limits and within budget target range.

A large number of respondents (76.5 percent) strongly agreed/agreed that executive management gave its full support towards the implementation of projects, while 23.6 percent strongly disagreed/disagreed.

A large number of respondents (68.7 percent) strongly disagreed/disagreed that lessons learned from close-out meetings are archived for the purposes of future projects, while only 31.3 percent strongly disagreed/disagreed.

5.3 RECOMMENDATIONS

The following recommendations relating to the factors influencing the quality and success rates of RDP housing projects in the Eastern Cape are based on the objectives of the study, the findings of the study and the related literature that was reviewed.

5.3.1 The causes of poor service delivery in housing projects

The study recommends that it is imperative that project team members engaged in project management have the necessary skills and level of education to execute their duties, so a project team should be provided with means and ability. It is also imperative that project team members and all stakeholders have clear and defined channels for communicating and reporting progress, problems

and any developments during the project life cycle. The institution also needs to ensure that all stakeholders involved in project management have the necessary skills to perform their tasks.

A project manager should define project team member's roles and accountability through a visual process chart and a responsibility matrix and confirm understanding with the key team members. The project manager should review the project charter and project plans with the project team members and stakeholders to ensure that all stakeholders have approved documents. The project team should build the plan together to encourage ownership. The plan must be kept up to date, especially when changes are requested frequently.

5.3.2 Effectiveness of project management

The project manager should create a concise project definition document with the intention of getting absolute clarity of purpose, accepted by all stakeholders. The project manager should also develop a detailed, written plan shared with all participants and a summary of the overall project goals, roles, tasks and a list of team leaders. It is essential to adopt the Project Alignment Model (Figure: 1) for effective project management. This model should include understanding the business environment; creating a shared vision for the purpose; establishing project identity; sharing responsibility and demonstrating commitment; as well as the PMBOK principles. It is also highly recommended that project managers and team members derive a checklist from the Project Alignment Model.

5.3.3 Strategies to improve the quality of projects

It is recommended that the institution should draft a policy on QMS/best practices in respect of its project scope of works and get registered to satisfy the

requirements of the South African Bureau Standards (SABS/STANSA) in order to ensure that all stakeholders conform to the set standards. Project team members and all stakeholders must be encouraged to participate in meetings, discussions and workshops related to the project visions and objectives. Project leaders should ensure adequate time and staff are devoted to getting quality site monitoring of specific project results at the start of the project. The organization should ensure that it forms a strong guiding partnership with key stakeholders. The project manager should co-create the project purpose with all stakeholders and define what, why, how and when. Senior managers and executives should “walk the talk”, understand the changes with employees participate in project events and support new behaviour. The organization should ensure that project team members and all stakeholders hold a formal “Project Close-out Meeting” as soon as possible after a project is completed. The outcome of the meeting would be the creation of a formal document of “Lessons Learned” for archiving and to be carried for future projects. DHLG should develop more systems and standardize approaches to pre-qualify contractors submitting bid.

Lastly, procedures and methods need to be tailored to suit the circumstances of each type of customer, project and the changing economy.

5.4 SUGGESTIONS FOR FUTURE RESEARCH

During this study, certain areas were identified that can provide opportunities for further research:

- With government facing increasingly dynamic business conditions, project managers must be increasingly business-aware and have more than just technical delivery skills. Training in project/programme management in systems optimization, project management tools and human

relations/organizational development must be compulsory. It is suggested that research be done on the cost of quality and training;

- Due to the high response rate in QMS/best practices in this study, it is suggested that a study to articulate stakeholders, QMS and critical supervision in construction projects be done at the same institution; and
- To help these project leaders maintain successful project management, the key points from the literature review need to be presented in a framework. It is suggested that research be done on the development of a project management framework.

5.5 CONCLUSION

This study investigated the factors influencing the quality of construction project success rates of RDP housing projects in the Eastern Cape.

The study found that:

- There are several problems facing RDP housing projects caused by contractors using unskilled labour, a lack of technical competence by contractors, the process or activities of projects are incorrectly implemented and lack of communication amongst project teams;
- A lack of defining the overall scope of projects, having no plan and clear definition and overall poor project management; and
- The lack of strategies to improve the quality of projects.

Therefore, based on the recommendations in paragraph 5.3 above, this study could improve the overall service delivery of RDP housing projects.

The following hypotheses in the study were confirmed by the research:

- Ho: the appointment of inexperienced contractors/labour has an impact on project success;
- Ho: the lack of proper supervision on site will hinder project success;
- Ho: leadership does not have the necessary qualifications;
- Ho: the process or activities of projects are incorrectly implemented; and

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APPENDIXES

Appendix A- Letter of Consent

47 Seaforth Ave, 1 Hilversum
MUSGRAVE
4000

Dear Respondent

I am Mr Z.H. Gabula currently studying towards my Master of Technology Degree in Operations and Quality Management at the Durban University of Technology (DUT). The title of my research project is FACTORS INFLUENCING THE CONSTRUCTION PROJECT SUCCESS RATES OF RECONSTRUCTION DEVELOPMENT PROGRAMME (RDP) HOUSING PROJECTS IN THE EASTERN CAPE: A QUALITY PERSPECTIVEA CENSUS STUDY. I would appreciate your participation in completing this questionnaire.

The completion of the questionnaire should not take longer than 20 minutes of your time. I want to thank you in advance for your time. Please be assured that your identity will remain anonymous and your responses will be kept confidential.

Participation in this research study is voluntary and you may withdraw from the study at any time without providing a reason.

Your co-operation in this research is greatly appreciated.

Should you require any further information concerning the study as a whole or this survey in particular, please do not hesitate to contact me at:

Telephone 031322 1191 (work)

084 920 8337 (cell)

e-mail: gabulaz@elec.durban.gov.za

I look forward to receiving your response and thank you in anticipation for willingness to participate.

Yours sincerely

Zandisile Gabula

MTech Student in the Faculty of Operations and Quality Management

Appendix B - Questionnaire

SURVEY ON THE PROJECT MANAGEMENT AND CONSTRUCTION OF RDP PROJECTS IN THE EASTERN CAPE

Information gathered is for research purposes only and no individual or organization will be compromised in any way. No South African organization or individual will be identified in the final report.

SECTION A:

PERSONAL AND COMPANY INFORMATION

Mark the appropriate box with a cross (X).

1. Please indicate your gender.

Male	
Female	

2. Please indicate your age.

17 – 25	30 – 38	40 – 49	50 – 60 or over
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3. Please indicate relevant experience of service.

Less than 1 yr	1 to less than 2 yrs	2 to less than 5 yrs	5 to less than 15 yrs
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4. State your qualification.

ND		BTech.		BSc.		MSc		Other	
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SECTION B:

PROJECT MANAGEMENT TECHNIQUES

- Please read through each statement carefully before giving your opinion.
- Please tick one box for each statement.
- Please do not discuss statements with anyone.
- Please return questionnaire after completion.
- Rating guide is as follows:

1	STRONGLY DISAGREE
2	DISAGREE
3	AGREE
4	STRONGLY AGREE

- For each of the following statements, please indicate your level of agreement, as they apply to your organisation's perception on management of RDP projects.

	STATEMENTS	PERCEPTIONS			
1	Problems related to RDP projects are caused by contractors using unskilled labour.	1	2	3	4
2	Millions of rands are spent by government on repairs for defective workmanship.	1	2	3	4

3	Project failure is characterised by deficiency in design documents.	1	2	3	4
4	There is a lack of communication with project teams.	1	2	3	4
5	Process or activities of projects are incorrectly implemented.	1	2	3	4
6	There is a lack of technical competence by contractors.	1	2	3	4
7	Incorrect documents are provided for the construction of projects.	1	2	3	4
8	Each project is properly planned.	1	2	3	4
9	Primary projects define the overall scope.	1	2	3	4
10	All projects have a plan and clear definition.	1	2	3	4
11	Projects are strategically aligned to improve quality.	1	2	3	4
12	The project management environment supports the culture to improve quality.	1	2	3	4
13	Strategic project management best practices are implemented to improve quality.	1	2	3	4
14	All stakeholders are in attendance at relevant meetings to contribute their ideas.	1	2	3	4
15	A strategic project measurement system is implemented to improve quality.	1	2	3	4
16	Insufficient time is devoted to quality site management.	1	2	3	4
17	A lack of client involvement in the project hinders quality achievements.	1	2	3	4
18	Projects are deemed successful if they are completed on specified time limits.	1	2	3	4
19	A project is deemed successful if it solves the	1	2	3	4

	problem it was intended to within budgets limits.				
20	Executive management gives its full support towards the implementation of projects.	1	2	3	4
21	Lessons learned from close-out meetings are archived for purposes of future projects.	1	2	3	4

Thank you for your kind cooperation.

Zandisile H. Gabula

Appendix C – Reliability

Table 5b : Reliability

Reliability Statistics

Cronbach's Alpha	N of Items
.461	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B1	19.78	5.253	.430	.332
B2	19.47	6.054	.250	.415
B3	20.47	5.814	.120	.472
B4	20.31	5.540	.314	.381
B5	20.20	5.281	.411	.339
B6	19.73	5.043	.549	.287
B7	20.90	6.090	.096	.476
B8	20.00	7.760	-.292	.617

Table 5: Reliability

Reliability Statistics

Cronbach's Alpha	N of Items
.345	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B9	2.84	.855	.214	.a
B10	2.90	.530	.214	.a

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

Table 5d : Reliability

Reliability Statistics

Cronbach's Alpha	N of Items
.776	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B11	29.94	18.336	.497	.751
B12	29.84	18.335	.556	.745
B13	30.00	17.560	.711	.729
B14	30.02	17.140	.598	.736
B15	30.06	17.336	.669	.730
B16	30.35	19.833	.203	.786
B17	30.24	19.384	.316	.771
B18	29.80	19.961	.226	.781
B19	29.75	19.634	.280	.775
B20	30.00	19.000	.374	.765
B21	30.20	18.521	.375	.766

Appendix D – Analysis of variance

Table 10 : Analysis of variance – Age group

Descriptives

		N	Mean	Std. Deviation
Causes of poor service delivery	17-25		2.8646	.24690
	30-38	30	2.9208	.35732
	40+	9	2.7222	.33528
	Total	51	2.8725	.33306
Effectiveness of PM	17-25	12	2.8750	.48265
	30-38	30	2.8833	.72734
	40+	9	2.8333	.61237
	Total	51	2.8725	.64686
Strategies to improve quality	17-25	12	2.9848	.38537
	30-38	30	2.9727	.47697
	40+	9	3.1212	.30151
	Total	51	3.0018	.42698

ANOVA

		F	p
Causes of poor service	Between Groups	1.248	.296
Effectiveness of PM	Between Groups	.020	.980
Strategies to improve quality	Between Groups	.421	.659

Test Statistics^{a,b}

	Chi-Square	df	p
Causes of poor service	3.896	3	.273
Effectiveness of PM	.132	3	.988
Strategies to improve quality	1.649	3	.648

a. Kruskal Wallis Test

b. Grouping Variable: Age

The results of both the parametric anova and Kruskal-Wallis anova reflects no difference between age groups at the 95% level ($p>0.05$)

Table 11 : Analysis of variance – Experience

Descriptives

		N	Mean	Std. Deviation
Causes of poor service delivery	Up to 2 years	8	2.9063	.28150
	2-5 years		2.8452	.30594
	5-15 years	22	2.8864	.38365
	Total	51	2.8725	.33306
Effectiveness of PM	Up to 2 years	8	2.6875	.84251
	2-5 years	21	2.8095	.64180
	5-15 years	22	3.0000	.57735
	Total	51	2.8725	.64686
Strategies to improve quality	Up to 2 years	8	3.0000	.46861
	2-5 years	21	2.8701	.40203
	5-15 years	22	3.1281	.41580
	Total	51	3.0018	.42698

ANOVA

		F	p
Causes of poor service	Between Groups	.126	.882
Effectiveness of PM	Between Groups	.849	.434
Strategies to improve quality	Between Groups	2.043	.141

Test Statistics^{a,b}

	Chi-Square	df	p
Causes of poor service	.248	2	.883
Effectiveness of PM	1.531	2	.465
Strategies to improve quality	3.733	2	.155

a. Kruskal Wallis Test

b. Grouping Variable: Experience

The results of both the parametric anova and Kruskal-Wallis anova reflects no difference between categories of experience at the 95% level ($p > 0.05$)

Table 12 : Analysis of variance – Qualification

Descriptives

		N	Mean	Std. Deviation
Causes of poor service delivery	ND	25	2.8800	.26389
	BTech	14	2.9643	.41146
	BSc & Other	12	2.7500	.35355
	Total	51	2.8725	.33306
Effectiveness of PM	ND	25	2.9000	.62915
	BTech	14	2.7857	.75229
	BSc & Other	12	2.9167	.59671
	Total	51	2.8725	.64686
Strategies to improve quality	ND	25	2.9455	.32141
	BTech	14	3.0130	.55682
	BSc & Other	12	3.1061	.46651
	Total	51	3.0018	.42698

ANOVA

		F	p
Causes of poor service delivery	Between Groups	1.370	.264
Effectiveness of PM	Between Groups	.171	.844
Strategies to improve quality	Between Groups	.570	.569

Test Statistics^{a,b}

	Chi-Square	df	p
Causes of poor service delivery	1.791	2	.408
Effectiveness of PM	.236	2	.889
Strategies to improve quality	1.565	2	.457

a. Kruskal Wallis Test

b. Grouping Variable: Qualification

The results of both the parametric anova and Kruskal-Wallis anova reflects no difference between categories of qualification at the 95% level ($p > 0.05$)