RISK MANAGEMENT PRACTICES ON PUBLIC SECTOR CONSTRUCTION PROJECTS: CASE STUDIES IN LESOTHO

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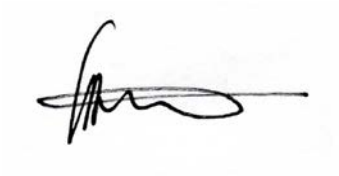

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RISK MANAGEMENT PRACTICES ON PUBLIC SECTOR CONSTRUCTION PROJECTS: CASE STUDIES IN LESOTHO

By

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SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MAGISTER SCIENTIAE IN CONSTRUCTION MANAGEMENT IN THE FACULTY OF ENGINEERING, THE BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY AT THE NELSON MANDELA METROPOLITAN UNIVERSITY

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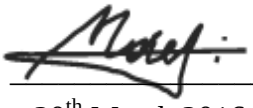
2016

STATEMENT OF ORIGINAL AUTHORSHIP

DECLARATION

I, MOLEFI EDWIN NKETEKETE (207012009) declare that the work contained in this dissertation has not been previously submitted in full or partial fulfilment of the requirements for an equivalent or higher qualification at any higher education institute. Based on current knowledge at the time of compilation, the dissertation contains no works previously published or written by another person except where due reference is made.

Signed: 

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ABSTRACT

Risk management (RM) is a knowledge area in project management (PM). The challenges of project complexity require astute RM. However, RM practices in Lesotho appear to lag behind international trends. Within the sub-Sahara African region, RM incompetence affects timely delivery of public projects owing to PM practices that do not address risks. This study, which adopts a case study approach, unravels the 'how and why' of contemporary RM practices which are lacking in Lesotho, despite a poor record of project success in the construction industry.

Through the reviewed literature and primary data collection, this study investigates three elements in order to determine the level of RM practice within Lesotho public sector construction projects. These elements were the basis of RM, the RM processes, and the peoples' perceptions which were essentially centred on the probability of risk and the impact thereof.

The results from the study achieved through cross-case synthesis show that the level of RM practice in the Lesotho public sector construction projects is at variance with international practice. The notable gaps in practice include construction professionals who do not know about or who have not practiced project RM.

The study thus propose that the Government of Lesotho (GoL) should invest in educating more people in the areas of construction project management or engage professionals with extensive project RM experience. The recommended initiatives should promote professionalism and accountability that are essential for bracing the RM practice in public sector construction projects.

Keywords: Construction, Projects, Public Sector, Risk Management, Lesotho

DEDICATION

Firstly, this work is dedicated to my mother, ‘Matebello and my late father, Thabo for the education they afforded me.

Secondly, I dedicate this dissertation to my wife, ‘Marelebohile, my two sons, Relebohile, and Reabetsoe for their love and support.

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LIST OF ABBREVIATIONS

- BDS – Building Design Services
- BOQ – Bill of Quantities
- CBEP – Council for Built Environment Professions Lesotho
- CMAA – Construction Management Association of America
- GDP – Gross Domestic Product
- GNDI – Gross National Disposable Income
- GoL – Government of Lesotho
- LCIC – Lesotho Construction Industry Council
- LRCP **–** Leshoele-Mathokoane-Bene-Setene Road Construction Project
- M – Maluti (Lesotho Currency)
- M-BRUP – Mpharane-BelaBela Road Upgrading Project
- MCA – Millennium Challenge Account
- NMMR **–** Nyenye-Mapoteng-Makhoroana Lot1 Road Rehabilitation Project
- MFDP – Ministry of Finance and Development Planning
- MOPWT **–** Ministry of Public Works and Transport
- NCIDP – National Construction Industry Development Policy
- NSDP – National Strategic Development Plan
- P-I – Probability and Impact
- PLC **–** Project Life Cycle
- PM – Project Management
- PMI – Project Management Institute
- PMBoK – Project Management Body of Knowledge
- PMKA – Project Management Knowledge Area
- R – South African Rand (ZAR) equivalent to 1 Loti
- RD – Roads' Directorate
- RM – Risk Management
- RMBOK – Risk Management Body of Knowledge
- RMC – Risk Management Competency
- RMP – Risk Management Processes
- RPF – Risk Priority Factor
- RSA – Republic of South Africa
- TCC – Tsifa-li-mali Court Complex Project
- RMTG – Risk Management Task Group

- SHEQ – Safety Health Environment and Quality

DEFINITION OF TERMS

- **Construction Management** – it is the professional management of the development, conservation, and improvement of the built environment applied to construction projects from inception to completion. This is exercised at a variety of levels from the site through the corporate organisations of the industry and its clients, to society in general for the purpose of controlling time, cost, scope, and quality, whilst embracing the entire construction value (CIOB, 2010: 4-5; CMAA, 2011: 1).
- **Infrastructure** – the basic systems and services that are necessary for a country or an organisation to run smoothly (Hornby, 2006: 766).
- **Project life cycle (PLC)** – a collection of project phases, such as concept, development, implementation, and close-out (Schwalbe, 2011: 57).
- **Project Management** – the application of knowledge, skills, tools, and techniques to project activities in order to meet project requirements (Schwalbe, 2011: G.11)
- **Project Management Office (PMO)** – an organisational group responsible for coordinating the project management functions throughout the organisation (Schwalbe, 2011: 29).
- **Public Infrastructure –** a public service that produces positive externalities for the production of public facilities and systems essential for the development of social and private sector economic activities that are vital for the day-to-day functioning and security of the country (Congressional Research Service, 2011: 3-5).
- **Risk** – an event that poses a threat or an opportunity to the project (Heldman, 2005: 213).
- **Risk assessment** – is the overall process of estimating potential impacts, likelihoods, and consequences of risks by employing both qualitative and quantitative techniques (Garlick, 2007: 13; Nicholas & Steyn, 2011: 369).
- **Risk identification** – a process of identifying potential project risks and documenting their characteristics (Heldman, 2005: 214).
- **Risk management** – a discipline for making decisions and acting, whilst demonstrably taking account of risk potential for different future outcomes (Garlick, 2007: 3).

- **Risk management plan** – is a plan that documents the procedures for managing risks throughout the project (Schwalbe, 2011: 428).
- **Risk mitigation** – The strategy that attempts to reduce the impact of a risk event by reducing the likelihood of its occurrence (Schwalbe, 2011: 448).
- **Risk monitoring** – an activity that includes gathering information, documenting and reporting the findings (Heldman, 2005: 214).
- **Risk propensity** – an individual's current tendency to take or avoid risks which is considered as an individual trait that can change over time as a result of experience. It is a situational-specific variable, indicating that a decision-maker's risk propensity differs in differing situations (Wang, Zhao, Zhang & Wang, 2015: 166).
- **Risk response**: action taken to reduce the exposure to a risk (Dallas, 2006: 372).
- **Risk response planning** – a process of deciding what actions to take to reduce threats, while taking advantage of other risks that are present (Heldman, 2005: 215).

CHAPTER ONE

RESEARCH BACKGROUND

1.1 Introduction

Research reveals that construction projects are facing problems that impede their expected performances and sustainability worldwide. More so than in other sectors, the construction industry is increasingly subjected to time, cost, quality, and competition limitations (Ford & Bhargav, 2006: 276). In some instances, failures have escalated in the region of 6% to 7% of contract costs with a 90% failure rate recorded on African projects (Sidawi & Egbu, 2011: 104; van Olden, 2014: 46). One of the predominant infrastructure challenges in sub-Saharan Africa is the lack of technical skills essential to speed up delivery (Laryea, 2010: 216). Studies show that most sub-Saharan construction organisations do not implement RM: management tools and techniques when managing projects (Chileshe & Kikwasi, 2013: 1138). Therefore, a systemic risk challenge is evidently endemic in this sector (Mahamid, 2013: 45).

The construction industry has embraced the role of PM, which consecutively entails RM as one of its essential knowledge areas worldwide. Hashem and Guggemos (2013) affirm that RM is an important factor in terms of construction project success. Thus, every stakeholder must be fully engaged in managing project risks throughout the project lifecycle (PLC) (Schwalbe, 2011: 422; Taylor, 2011). The RM process emphasises risk as a project-unique phenomenon, together with the experience of the project team (Nicholas & Steyn, 2011: 363). RM is essential for improved project performance (Zhang & Fan, 2013: 195) because risks and uncertainty have emerged as immeasurable forces that thwart prospects of achieving project objectives. Construction projects regularly experience problems when PM practices do not recognise risks (Saffin & Laryea, 2012: 1308), hence records of non-excusable delays, excessive time and cost overruns are common in the sub-Saharan region (Ssegawa–Kaggawa, Ngowi & Ntswene, 2013: 1; Ibironke *et al*., 2013: 53-54). Therefore, competent project managers proactively incorporate new strategies to mitigate risk impacts under uncertain scenarios (Ford & Bhargav, 2006: 275-276). It follows therefore that any project, whether small or big, should consider risk factors and seek to mitigate them.

However, RM is not practiced in projects properly in sub-Sahara Africa (Gana & Olorunfemi, 2015: 16; Kululanga & Kuotcha, 2010: 337; Laryea, 2007: 2). Therefore, this research focuses on assessing the local RM practice in public sector construction projects in Lesotho.

1.2 Problem Statement

In responding to capital infrastructure requirements, major public construction projects have been undertaken in Lesotho. However, some of these have reportedly failed owing to technical, financial, socio-political, and environmental problems which have led to immense cost overruns and delays (Mpaki, 2014a: 25; Ntsukunyane, 2015: 4). To minimise such adversities, project RM has been identified as a necessary strategy (RMTG, 2012: 5). However, projects do not succeed when the stakeholders are incompetent in terms of RM practices. Sub-Saharan African nations are reported to be experiencing greater shortages of competent project management professionals, *inter alia*, project risk managers, than are any developed nations (Kululanga & Kuotcha, 2010: 337).

The problem statement for this research investigation is that *in Lesotho, stakeholders in the construction process are failing to implement risk management practices that employ contemporary methods and techniques which are necessary to assure project success.*

1.3 Research Questions

The investigation attempts to resolve the research problem through posing the following questions:

- How is RM perceived in a public sector construction project in Lesotho?
- How is construction RM practiced in a public sector project in Lesotho?
- How do construction risks change during a project life cycle in the public sector in Lesotho?
- How should construction risk management processes (RMP) be used on public sector projects in Lesotho?

1.4 The Rationale and Significance of the Study

According to the Government of Lesotho (2013: i), in order for Lesotho to achieve sustainable development, the National Strategic Development Plan (NSDP) strategic goals shall aim to develop key infrastructure and enhance its skills base. Major infrastructure projects have been acknowledged as the main investment drivers in Lesotho with the Gross National Disposable Income (GNDI) rising to around 25% over the last thirty years, but which has recently dwindled to 15% (Government of Lesotho, 2013: 16). The investment climate is aggravated by poor road transport networks and weak customs' and trade facilitation. Heavy rains and floods have caused deterioration of existing roads and have retarded construction sector growth (African Development Bank Group, 2013: 2; Government of Lesotho, 2013: 24-27).

According to the Government of Lesotho (2013: 21), much of the population is still deprived of basic services in the form of water, sanitary, and electricity utilities.

Lesotho is still faced with infrastructural shortages (Ngoma, Mundia & Kaliba, 2014: 16). Therefore, the GoL has planned to invest in a number of public construction projects in order to alleviate these problems and speed up economic growth (Government of Lesotho, 2013: iii). However, in order to realise this dream, project risks must be closely managed (Schwalbe, 2011: 424) in order to mitigate cost overruns and ultimately attract potential investors into the public infrastructural projects. Investigating the practice of RM in the local public construction projects could help stakeholders to re-evaluate ways to minimise losses in order to fulfil the NSDP strategic goals.

The least developed economies such as Lesotho and other African counterparts are still unable to fully address the infrastructural challenges and fulfil the national developmental mandates due to technical skills' inadequacies (Laryea, 2010: 216; Government of Lesotho, 2013: 65) which are essential in project RM (Nicholas & Steyn, 2011: 363). Because risk is a function of project uniqueness and the stakeholders' experience (Nicholas & Steyn, 2011: 363), this study reviews three different construction projects in order to propose a practical RM framework for use in Lesotho.

1.5 Aims and Objectives

To provide responses to these questions, the study evaluated how construction RMP operates, and how stakeholders are managing risks in public sector projects in Lesotho. The purpose was to compare theory and practice in order to identify ways to improve the construction RMP in Lesotho, especially with regard to public sector projects. The study therefore aims to unravel the 'how and why' of RM methods and techniques that are lacking in Lesotho with its poor record of project success in the construction industry. To realise this aim, the objectives of the study include an investigation into the:

- Perceptions of risks on public sector construction projects in Lesotho;
- The practice of construction RM in public sector projects in Lesotho;
- How construction risks change during a project life cycle in the public sector in Lesotho, and
- How the construction RMP should be used on public sector projects in Lesotho.

Figure 1.1 indicates the sequence of chapters for this study. Chapter 1 presents the background to the research. Chapter 2 provides a theoretical framework based on literature relevant to this study, followed by Chapter 3, which outlines the research methodology adopted. Chapter 4 describes the field work and presents the empirical data that was collected and which is presented in Chapter 5. The findings of the study are discussed in Chapter 6 and the conclusions and recommendations are presented in Chapter 7.

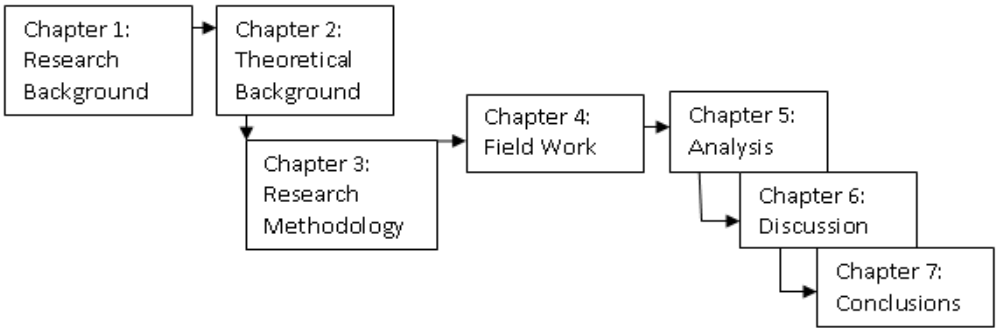


Figure 1.1: Research structure

1.6 The Assumptions

- There are risks involved in construction delivery;
- There are many sources of risks in a construction project life cycle;
- RM practice has a major influence on project success, and
- Public sector construction projects are laden with diverse forms of risks.

1.7 Delimitations of the Study

The following research limitations were adopted and supplemented by case selection criteria specified in Appendix E.

- The investigation addressed only public construction projects in excess of M100 million in value;
- The study was confined to Lesotho borders;
- Only literature from 2005 to the present was cited, and
- Information was collected from local, regional and foreign contractors who have been executing civil and building construction projects in Lesotho.

1.8 Summary

The paucity of infrastructure in Lesotho has remained a challenge to economic growth. Previous studies pertaining to construction RM show that risks contribute to project failures. Therefore, this study focuses on comprehension of RM practice in Lesotho construction so as to improve the chances of project success in the country. The aims and objectives, assumptions, and the study delimitations are succinctly presented. The rationale gives the readers a concise background on risks and the Lesotho public sector construction projects. A further theoretical investigation with respect to risks and RM practice is presented in Chapter 2 to support the rationale for the study.

CHAPTER TWO

THE THEORETICAL FRAMEWORK

2.1 Introduction

This chapter presents the relevant PM and RM theoretical backgrounds. However, first and foremost, an outline of the Lesotho construction industry is presented. Selected Lesotho public construction projects with particular attention to their performance, shortfalls, and pitfalls across the PLC are presented. Furthermore, the basis of RM practice, together with the RMP, and perceptions regarding risks relative to public sector construction projects are also outlined.

2.2 An overview of the Lesotho construction industry

According to Wade (2014: 63), by the end of 2015, the construction industry will account for 22% of Lesotho's GDP emanating from new dams, roads, and public building projects. Beside the Millennium Challenge Account (MCA) bilateral pact, the GoL is still sourcing overseas funds for ongoing public projects (African Development Bank, 2011: iv).Wade (2014: 63) points out that the National Strategic Development Plan (NSDP) has made recommendations for the establishment of a regulatory body via a local construction industry development study (LCIDS). The recommendations include the adoption of a National Construction Industry Development Policy (NCIDP) and Construction Industry Development Act (CIDA) frameworks. As a result, the Lesotho Construction Industry Council (LCIC) will start with the registrations of contractors, while the Council for Built Environment Professionals (CBEP) will oversee the development of the industry and the necessary accreditation as part of its mandate (Wade, 2014: 63). The government has since sought the services of consultants to help in formulating a regulatory framework (Lekhetho, 2011).

2.3 Problems in the local construction industry

Apropos the identified public construction projects, delays have been identified as a major project setback (Mpaki, 2014a: 25; Ntsukunyane, 2015: 4). As in other African countries, government-related delays stifle projects' progress (Agyakwa-Baah & Chileshe, 2010: 1226). The causes of these delays have been listed in Table

2.1; external risks have been identified as common sources of problems in all three indentified projects. Table 2.1 further highlights the impact of identified risks on construction projects. It is worth noting that on average, delays are prevalent due to inclement weather conditions. In the process, cost overruns are triggered by these problems (African Development Bank, 2011: iv; Mpaki, 2014a: 25; 2014b: 26). The reports clearly indicate that the problems identified in Table 2.1 emanate from different sources, similar to those identified in Table 2.2. According to Issa, Emsley and Kirkham (2012: 1221), most problems encountered on infrastructural projects are due to common risks. Currently, there is no evidence of formal research on PM/RM in organisations or construction projects in Lesotho to present.

2.4 Basis of risks and uncertainties in construction projects

According to Taroun, Yang and Lowe (2011: 87) citing Latham (1994), "no construction is risk free. Risk can be managed, minimised, shared, transferred or accepted". Risk is an uncertain event or condition that has a positive or negative effect on project objectives (Enshassi & Mosa, 2008: 96; Heldman, 2005: 213; Schwalbe, 2011: 425; RMTG, 2012: 13). Meredith and Mantel (2010: 58) describe uncertainty as a state of being unsure about the project parameters, whereas risk affects all elements of works on projects. In addition, risk is defined as a product of the uncertainty with respect to project's objectives' (Issa, Emsley & Kirkham, 2012: 1220; Schwalbe, 2011: 8). Issa, Emsley & Kirkham (2012: 1221) advocate a 'technicist' approach, i.e. the adoption of cognitive science perspectives on risk as a quantifiable concept without considerations for uncertainty, while the 'radical' approach recognises uncertainty as a unique concept. Since projects are risky and complex, experience and RM knowledge have become vital tools in controlling and probing project uncertainties (Ameh & Odusami, 2014: 2; Nicholas & Steyn, 2011: 362-363). For example, some researchers have recommended the 'Alien Eyes' Risk Model to manage risks (Ke & Wang, 2006: 1-3).

2.4.1 Effects of risk on a construction project life cycle

Projects are synonymous with risks which have incessant negative or positive impacts (Schwalbe, 2011: 425; Nicholas & Steyn, 2011: 363). These researchers concur that most serious setbacks are encountered when the project is nearing completion. Therefore, risk is a factor of the '*likelihood*' of setbacks and the

'*impact*' unique to a project; these can only be minimised by an ascribed process of RM (Nicholas & Steyn, 2011: 363; Roberts, 2013: 110). Risk has a direct impact on time which mostly contributes to cost overruns (Afshari *et al*., 2011: 42; Assaf & AL-Hejji, 2006: 349-350). Wang and Flanagan (2015: 156) discovered that an oversight from identifying potential problems and other important details at the planning stage is a major risk source due to time constraints. Ultimately, risks affect time, quality, cost, and scope parameters of projects, which Schwalbe (2011: 9) has therefore referred to as a *quadruple constraint*. Table 2.1 highlights the problems unique to each project, with an emphasis on time and cost effects.

Table 2.1: Risk impact on selected major public construction projects in Lesotho

Project	Risk Type	Causes of Delays	Effect on Project Performance
The Mpharane-Belabela Road Upgrading Project (M-BRUP)	• Internal-market, technical & assumption.	• Insufficient road-users cost recovery (about 36.5%) • Project objectives were not succinct • Design brief and feasibility studies were inadequate • Heavy rainfall	• Delays – 9 months • Cost overruns (55.3%)
The Metolong Dam Project	• External & internal-assumptions	• Logistical challenges • Labour disputes • Heavy rainfalls	• Delays – 1 year • Cost overruns
The Tikoe Industrial Estate Project	• External	• Delayed funds • Inclement weather	• Delays – 1 year • Cost overruns

Adapted from the African Development Bank (2011: iv) and Mpaki (2014a: 25; 2014b: 26).

Furthermore, a project has a starting point and progresses towards a set conclusion: during this process the project organisation's state changes (Nicholas & Steyn, 2011: 76). For example, the PLC in many sectors experiences unique challenges that have an impact on the project outcomes, relative to the project duration and activity level changes. According to Nicholas and Steyn (2011: 76), time, cost, and performance can all help to measure the level of activity throughout the PLC. A good PLC methodology encourages Front-End Loading (FEL); giving early phases

of planning and development the kind of focus they deserve (Mabelo, 2012: 12). According to Schwalbe (2011: 58), the traditional PLC is broken up into the project feasibility phase (entailing concept and development) while the acquisition phase entails implementation and close-out. Conversely, Nicholas and Steyn (2011: 77) aver that a lifecycle of a human-made system shall entail the following: conception, definition, execution, and operation phases.

Since construction projects are prone to unending challenges due to risks which are dynamic in nature, Zou, Zhang and Wang (2006: 2) insist that different RM strategies shall be deployed at different project phases. Schieg (2006: 78) observes that at the start of the project, costs might be high but continue to plummet following the adoption of RM. To sustain RM throughout the PLC, the Performance Information RM System (PIRMS) as a RM tool has been incorporated into the operation stage of the model illustrated in Figure 2.3 as it supplements the initial RM plan (Kashiwagi, 2011: 17). Analysing risks from a PLC perspective is important as risks change through initiation, planning and design, execution, and closeout phases of the project (RMTG, 2012: 2-19). During road construction related research, Hashem and Guggemos (2013) discovered that diverse risks with different impacts emerged at different phases of the project. Hence stakeholders' engagements are necessary throughout the PLC in order to mitigate these risks jointly (Nicholas & Steyn, 2011: 78-79; Zou, Zhang & Wang, 2006: 11-12).

2.5 Project Risk Management Processes (RMP) in practice

According to Schwalbe (2011: 422), RM helps stakeholders to understand the nature of the project and promotes accountability. Schwalbe (2011: 427) outlines six steps in the RMP i.e. RM planning, risks identification, performing qualitative risks analyses, performing quantitative risks analyses, risks response planning, risks monitoring and controlling: these steps must be undertaken throughout the PLC. However, according to Nicholas and Steyn (2011: 363), an incisive RMP identifies risks, after which it assesses the importance of such risks, prepares a response plan, deals with the consequences, tracks the risks, and takes the needed action. Shang *et al*. (2005: 393) citing Tummala and Buchett (1999) assert that the RMP consists of five core elements which are as follows: risk identification, risk measurement, risk assessment, risk evaluation, risk control and monitoring. Risk analysis and

assessment have been identified as the most important RMP elements (Schieg, 2007: 145; Taroun, Yang & Lowe, 2011: 87). Yet, despite this, Shang *et al*. (2005: 392) insist that the risk assessment process is still not well practiced in construction projects.

The approaches in RM may be different but the objectives are quite similar as processes often contain identical concepts (Kululanga & Kuotcha, 2010:337). Significantly, the RM plan must precede the identification process so that risk profiling, risk appointments, risk reservation, establishing communication channels, and documentation can carry on (Nicholas & Steyn, 2011: 384).

2.5.1 RM planning

According to Schwalbe (2011: 427), this step involves deciding how to approach, plan, and execute the risk management activities for the project. This document identifies concerns about risks to the project (Kashiwagi, 2011: 40). The RM plan follows first, the review of the project scope statement and then the following: cost, schedule, and communications management plans; enterprise environmental factors; and organisational process assets (Schwalbe, 2011: 427). The plan defines the level at which RM will be performed and specifies ways to identify all major project risks and specifies the person responsible for managing the risks (Nicholas & Steyn, 2011: 384; RMTG, 2012: 11). In order to intensify the RM plan the following may be included: contingency plans, fallback plans, and contingency allowances (Schwalbe, 2011: 429-430).

2.5.2 Risk identification

Only known risks can be managed (Schwalbe, 2011: 427). Nicholas and Steyn (2011: 364) state that the RMP starts with the identification of risks and their probable effects. It is important to consider how the construction business will be affected as a whole, hence the categorising of risks throughout the PLC is important (Issa, Emsley & Kirkham, 2012: 1221; Roberts, 2013: 111). Moreover, a PLC is subject to either internal or external risks (Schieg, 2007: 151). According to Nicholas and Steyn (2011: 365), internal risks are market-, assumptions- and technical-related, depending on their sources or origins. As indicated in Table 2.2, internal risks arise from the physical structure and the construction process, while external risks are factors which cannot be influenced by the project participants

(Schieg, 2007: 151). Furthermore, Schieg (2006: 79, 2007: 151) divides endemic risks in the construction industry according to the following types: quality; personnel; costs; deadline; strategic decisions' risks; external; environmental; technical; scheduling; legal and contractual; financial, and management. Forbes, Smith and Horner (2007: 736) grouped and termed these risks using the acronym, PESTLE, i.e. Political, Economic, Social-cultural, Technological, Legal, and Environmental.

Table 2.2: Project risk sources

Internal risks			**External risk**
Market Risks	**Assumptions Risks**	**Technical Risks**	
Inadequate market assessment Failure to identify needs and requirements Failure to identify new trends and competitors	Risks associated with implicit / explicit assumptions made in feasibility studies and planning	Associated with meeting time & cost or quality performance requirements	Market conditions, competitors' actions, government regulations, interest rates, decision-making, customer needs, weather, terrain, labour & resources' availability, customer external control

Adapted from Nicholas and Steyn (2011: 365-366) and Schieg (2007: 151)

Schieg (2006: 79) identifies external risks as those related to natural occurrences, political changes, societal changes, market and sectoral trends' shifts, legal developments, and technological changes. In order to address both internal and external risks concurrently, there is a tendency to adopt various risk identification techniques as risk must be known before it can be measured (Nicholas & Steyn, 2011: 364). The techniques include brainstorming, the Delphi technique, interviews, analogy or historical data analysis, checklists, document reviews, case comparisons, SWOT analysis, cause-and-effect diagrams, work breakdown structure (WBS) analysis, process flow charts and project network diagrams are all essential in producing the risk register (Ke, Wang & Chan, 2012: 678; Nicholas & Steyn, 2011: 366; Schwalbe, 2011: 434-436). Furthermore, Schwalbe (2011: 433) insists that there is a need to consider risks' impacts on the other project management knowledge areas (PMKAs).

2.5.3 Risk assessment

Risk evaluation or assessment emphasises the importance of comparing risk levels against criteria where significant risks can be prioritised (Garlick, 2007: 24; Nicholas & Steyn, 2011: 369). This is assumed to be the most difficult component of the RMP and yet the most important (Schieg, 2007: 145; Taroun, Yang & Lowe, 2011: 87). The significance of this process depends on the degree of success in determining the risk probability, impact, and consequence whereby the latter becomes the function of the two former elements (Nicholas & Steyn, 2011: 369-375; Wiguna & Scott, 2005: 226). Popular risk assessment tools include the PERT and Monte Carlo simulation methods, Fussy Sets Theory (FST), Analytical Hierarchy Process (AHP), Probability-Impact (P-I) grids, decision support systems, and the Probability-Impact-Predictability (P-I-P) methods (Nicholas & Steyn, 2011: 372-376; Shang *et al*., 2005: 393; Taroun, Yang & Lowe, 2011: 87-90). Owing to its simplicity and completeness, Shang *et al*. (2005: 392) have recommended the following risk assessment process that engages all the PMO members in Figure 2.1. This framework demonstrates how the project stakeholders should assess risks step-by-step, using the recommended tools. As demonstrated, the project manager plays a central risk assessment role with the support from his team's inputs.

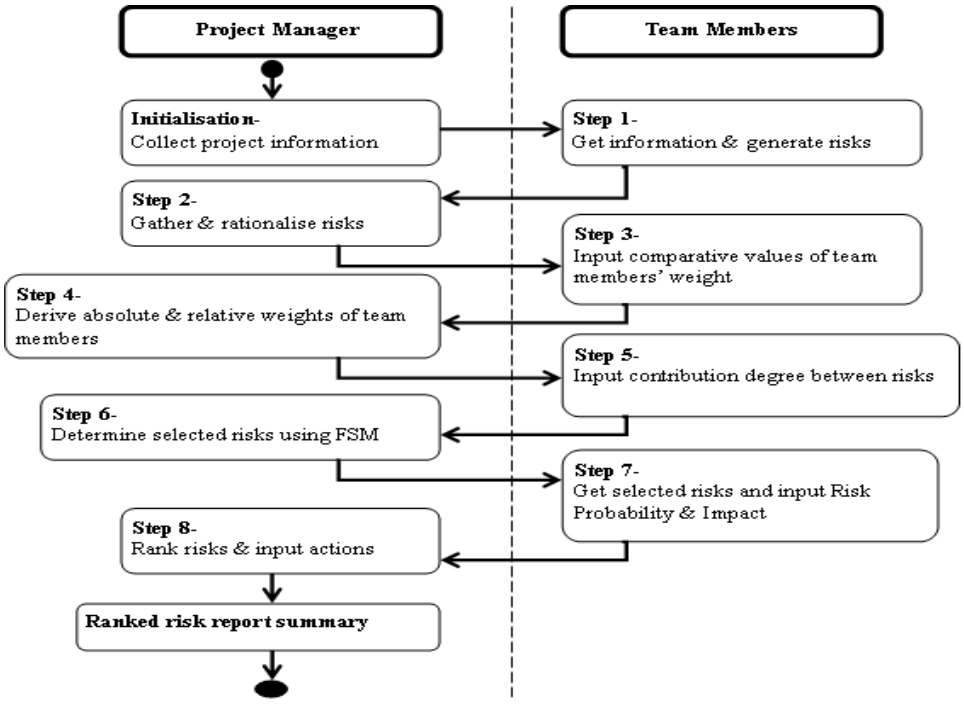


Figure 2.1: Risk assessment process

Adapted from Shang *et al*. (2005: 395)

2.5.4 Risk analysis

According to Schwalbe (2011: 428), the risk analysis process can be performed qualitatively and quantitatively. Heagney (2012: 52) asserts that project planning should encapsulate risk analysis within set project objectives. Identified risks are investigated with regard to their probability of occurrence and impact on the project in order to analyse the risk value (Schieg, 2006: 79). Qualitative risk analysis involves a probability-impact (P-I) matrix (Table 2.3), risk consequence rating (RCR) or consequence of failure (CF) charts, Top Ten Risk Item Tracking (TTRIT), and Monte Carlo analysis, while quantitative techniques include decision trees' analysis, expected monetary value (EMV), risk premium simulation, and sensitivity analysis (Schwalbe, 2011: 438-442; Ke, Wang & Chan, 2012: 678). Quantitative risk analysis is regularly given more attention by project managers (Taroun, Yang & Lowe, 2011: 87), despite having to come after the qualitative risk analysis (Schwalbe, 2011: 428-442).

Table 2.3: P-I qualitative risk analysis matrix

Impact						
0.9	0.9	1.8	2.7	3.6	4.5	***Very high***
0.5	0.7	1.4	2.1	2.8	3.5	***High***
0.5	0.5	1.0	1.5	2.0	2.5	***Medium***
0.3	0.3	0.6	0.9	1.2	1.5	***Low***
0.1	0.1	0.2	0.3	0.4	0.5	***Very low***
	1	**2**	**3**	**4**	**5**	
	Very low	***Low***	***Medium***	***High***	***Very high***	

Probability

Adapted from (Schwalbe, 2011: 439; Nicholas & Steyn, 2011: 373)

Table 2.3 illustrates a simple 5x5 qualitative risk analysis method where P x I= Risk priority factor (RPF). This narrates as follows: the Green category where RPF/ PI=0.1 to 0.6, risks require less attention; Yellow category where PI=0.4 to 1.0, risks require comparatively less attention; the Amber category requires a good amount of attention, while the Red category requires maximum risk attention (2.5-4.5 PIs). Importantly, the P-I risk analysis model combines both qualitative and quantitative data (Nicholas & Steyn, 2011: 370; Taroun, Yang & Lowe, 2011: 90).

Table 2.4: An illustrated project risk impact values for quality, cost, and time parameters

Impact Value	Impact		
	Quality performance	**Cost overruns (percentage)**	**Time delays (months)**
0.1 (low)	Minimal	Within budget	Negligible
0.3 (minor)	Small	1-10%	Minor slip (<1)
0.5 (moderate)	Moderate	10-25%	Moderate slip (1-3)
0.7 (significant)	Significant	25-50%	Significant (> 3)
0.9 (high)	Goals not achievable	>50%	Large slip

Adapted from Nicholas and Steyn (2011: 373)

Furthermore, Nicholas and Steyn (2011: 373) demonstrate that the subjective ratings can also be expressed as numerical measures between 0 (low), 0.3 (minor), 0.5 (moderate), 0.7 (significant), 0.9 (high), and 1.0 (catastrophic) to value risk impacts on the given project knowledge areas (Table 2.4).

2.5.5 Risk response

Following the identification and analysis processes, risk response planning considers how best to deal with the risk (Schwalbe, 2011: 447). Negative risks can either be transferred, avoided, accepted, mitigated, or contingency planned for (Schwalbe, 2011: 447-449; Nicholas & Steyn, 2011: 378-383). This can be achieved by using computer software, contingency planning, purchasing of insurance protection, identifying hierarchical risks levels, using a critical path method (CPM), or a WBS method (Ke & Wang, 2006: 2; Schwalbe, 2011: 448). The response strategies according to Schwalbe (2011: 449) include risk exploitation, risk sharing, risk enhancement, and risk acceptance which are all essential for positive risks. Collaborative strategies such as Public-Private Partnerships (PPP), Private Finance Initiative (PFI), Build-Operate-Transfer (BOT) and Build-Own-Operate-Transfer (BOOT) can be used to share and transfer risks (Tran & Molenaar, 2014: 633-634; Ngoma, Mundia & Kaliba, 2014: 16).

2.5.6 Risk monitoring and controlling

According to Schwalbe (2011: 450) risk monitoring and controlling involve executing the RMP to respond to risk events and ensure that risk awareness is an ongoing activity performed by the entire project team through the development of a sound project risk culture (Ke, Wang & Chan, 2012: 678; Schwalbe, 2011: 450). In order to produce the risk register updates, tools such as the following are used when

performing risk monitoring and controlling: variance and trend analysis, reserve analysis, risk audits, risk reassessments, weekly status meetings, sprint planning meetings, sprint review meetings, TTRIT, highlight reports, and technical performance measurements (Schwalbe, 2011: 450; Tomanek & Juricek, 2015: 85-86).

2.5.7 A risk management processes (RMP) framework

A gated or staged project promotes a need for planned phases and outcomes through progressive elaboration and integrated development throughout the PLC (Mabelo, 2012: 14). As Nicholas and Steyn (2011: 81) point out, an articulate RMP framework also helps in addressing risks emanating from Fast-Tracked project activities at all phases. In order to solve knowledge-based problems and extract similarities for case selection, the RMP model in Figure 2.3 is able to subsist at different project stages, whilst it enables the formulation of new RM solutions across different cases as supported by Forbes, Smith and Horner (2007: 736).

2.6 RM perceptions on projects

According to Nicholas and Steyn (2011: 363), technical project managers are used to working with evidences and tend to avoid the likelihood of risks because they find them too complex to deal with. Schwalbe (2011: 422) identifies RM as a commonly overlooked element of PM. Thus managing risks requires a dedicated team. Figure 2.2 demonstrates four different sectors where the PM risk maturity has clearly scored the lowest rating, as compared to the other eight project knowledge areas (PMKAs). Remarkably, the construction industry has earned better risk maturity ratings of 2.93 above the rest.

Forbes, Smith and Horner (2007: 736) have discovered that risk practitioners are opting for simple RM methods rather than more complex and effective ones. According to Shang *et al*. (2005: 392), project members mostly concentrate on getting the job done and tend to avoid RM procedures. Meanwhile Hillson (2012a: 30; 2012b: 34), asserts that risk culture as an important dimension of risk leadership is often overlooked, even though it moulds an effective RM practice throughout the PLC. A full PLC constitutes the following stages: conception/ feasibility, planning and design, execution/ construction, termination/ commissioning, operation, and

decommissioning (Ke, Wang & Chan, 2012: 678; Forbes, Smith & Horner, 2007: 736).

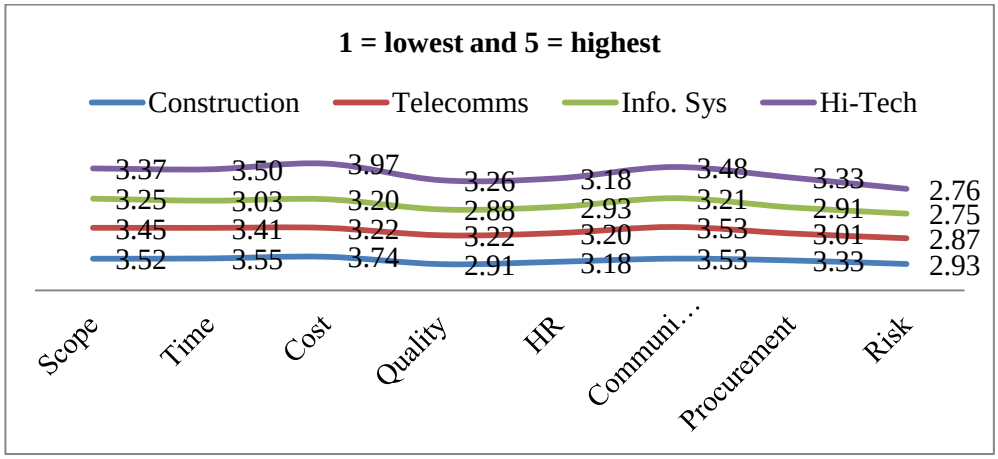


Figure 2.2: Project management maturity by industry group across PMKAs

Adapted from Schwalbe (2011: 423)

2.7 Summary

According to the reviewed literature, risk is a function of impact and likelihood. Risks should be identified and their impacts analysed on other PMKAs throughout the PLC. Hence, RM is a methodological process that requires a significant amount of information. The RMP in Figure 2.3 is adopted because it addresses the common and trusted approaches of most researchers reviewed in this study. Table 2.5 summarises how the theoretical framework addresses the semi-structured interview questions which are presented in Appendix C.

Table 2.5: The theoretical framework summary

Theoretical framework	Reference heading	Interview questions
1) Basis of RM practice:		
▪ Research question 1	2.4	Questions 1 to 4
▪ Research question 2		
2) The RMP:		
▪ Research question 2	2.5	Questions 5 to 8
▪ Research question 3		
3) The Perceptions:		
▪ Research question 1	2.6	Questions 9 to 13
▪ Research question 4		

Source: the researcher

The framework in Figure 2.3 presents an integrated RMP research framework. This pragmatic model incorporates relevant RM tools and outputs generated from the theoretical study throughout the PLC as recommended by Schwalbe (2011: 433).

The relationship sequence demonstrated in colour presents diagnostic features for the investigation of the RMP across the different facets of the project in order to attain the necessary replication (Leedy & Ormrod, 2010: 88).

This model was chosen because it was considered ideal for dissecting the research process into three distinct project RM features, namely; the basis of RM, the RMP, and the participants' perceptions. The tools and techniques identified as common and effective by most researchers are also presented under each process. The model shows an integrated RM sequence relative to each project stage essential to guide the research on how stakeholders perform RM across the entire PLC.

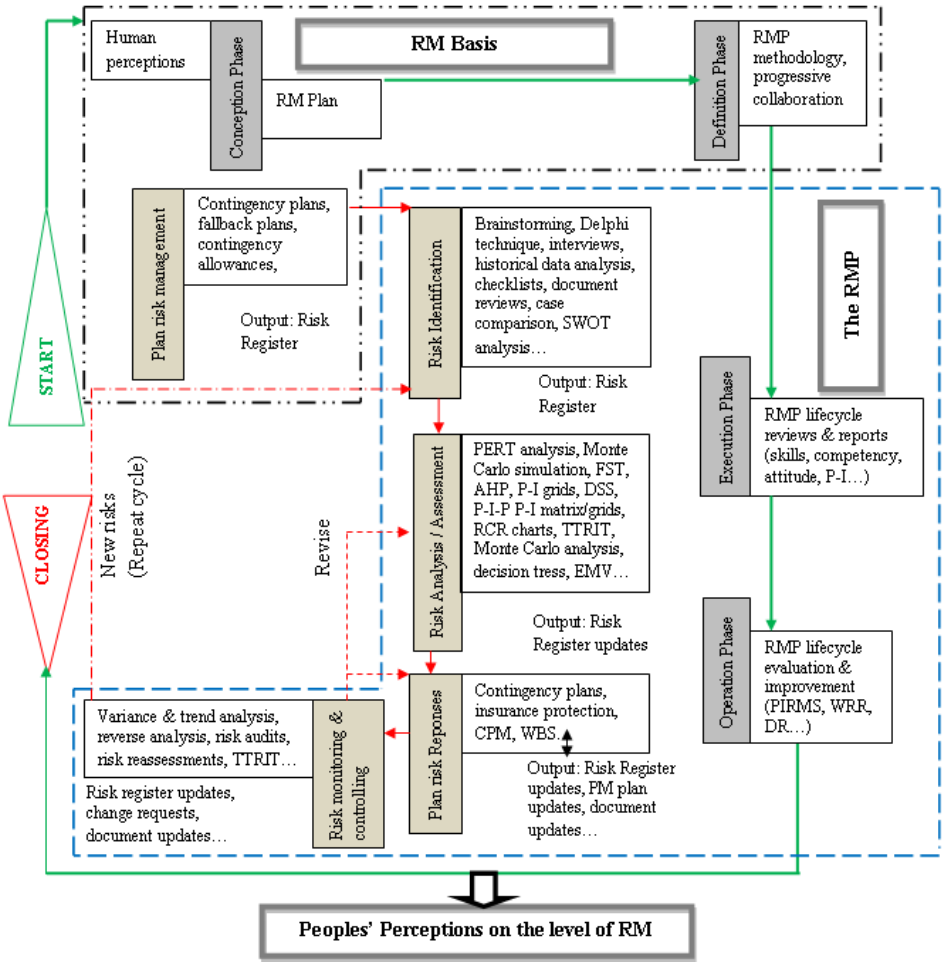


Figure 2.3: An integrated RMP research framework

Adapted from (Forbes, Smith & Horner, 2007: 736; Kashiwagi, 2011: 17; Mabelo, 2012: 12-19; Nicholas & Steyn, 2011: 79-80; Schwalbe, 2011: 57-105; Shang *et al.*, 2005: 393).

CHAPTER THREE

THE RESEARCH METHODOLOGY

3.1 Introduction

According to Gray (2009: 2), research is a methodical exercise meant to investigate specific problems that require solutions. This chapter outlines the research approach and design, data collection methods, and analysis strategies used for the study.

3.2 The Research Approach and Design

According to Leedy and Ormrod (2010: 136-137), qualitative strategies can help the researcher to gain new insights about the phenomenon, develop new theories about the phenomenon and discover the challenges within the phenomenon under investigation. Along with these challenges this study process entails descriptions of RM concepts, and verification and evaluation of risk-related elements. Yin (2011: 6-8) points out that qualitative research represents the views and perspectives of people, while offering an attractive and fruitful means of conducting a research. Based on the exploratory research questions adopted, it was decided that an inductive approach would be appropriate for gaining an understanding of complex RM issues and the drawing of conclusions about the studied project patterns. Therefore, knowledge accumulation with respect to RM requires greater exploration of ideas across different studies (Creswell, 2007: 40; Leedy & Ormrod, 2010: 33; Yin, 2011: 297).

Therefore, in order to explore how people practice and perceive RM in projects, a case study approach for a study of a unique case of RM practice in a real world context and in its own right was deemed as offering a suitable qualitative approach (Yin, 2011: 17-18). According to Leedy and Ormrod (2010: 137), cases that differ in terms of certain key elements can be used to make comparisons, build theory or propose generalisations. Therefore, this research aims to adopt a multiple case study approach in order to reinforce the investigation into RM practices in the Lesotho public projects.

3.3 Data Sources

Gray (2009: 247) has emphasised that case studies require the collection of several sources of data. This research is modelled around people and document sources for both primary and secondary data. Each data tool provides a significant basis for investigating the RM practices within the local public sector construction projects.

3.4 The Research Data

3.4.1 Primary data

According to Leedy and Ormrod (2010: 89), primary data are the most truthful and illuminating components of the fact-finding process. To obtain accurate perceptions and assist with descriptive analyses of RM, semi-structured interviews were conducted with the identified key project stakeholders as relevant interviewees within each case. Semi-structured interviews according to Leedy and Ormrod (2010: 188) adopt a standard set of questions while incorporating one or more self-tailored follow-up questions for clarification. The senior PM teams were asked to share their experiences and perceptions with respect to risk as outlined in Appendices C and D. The semi-structured interview data were then compared with project documents in order to establish the effectiveness of RM practice.

3.4.2 Interview transcripts

Interviews could assume a conversational mode in qualitative research (Yin, 2011: 32). Such mode is essential for an exploratory approach (Gray, 2009: 370). Creswell (2007: 140) notes that interviews need to be conducted in a warm manner in order for the interviewee to respond openly. The interviews therefore featured relatively open discussions relating to how RM is practiced and perceived. To uncover risk challenges for each case, Creswell (2007: 141) recommends journaling and archival research when collecting data, hence the use of audio recordings for this investigation. For the gathering of RM practice data, structured questions were first composed (see Appendices C and D for the interview schedules). These were complemented in minor instances with a variety of open-ended questions that were at some points conducted in Sesotho in order to capture information more easily (Leedy & Ormrod, 2010: 148-149). In other words, both closed-ended and open-ended questions were utilised in the field work.

The objective of this approach was to access all information - as encouraged by Yin (2011: 32) - pertaining to the level of RM practice. The questions targeted senior project actors' understandings of RM concepts and processes. This was followed by eliciting interviewees' recommendations in favour of the RM practice. As part of the field work, the interviewees were requested to complete a short questionnaire so as to obtain demographic information with a protocol as articulated by Creswell (2007: 341). To grade interviewees' perceptions regarding likelihoods and impacts of risks as highlighted in the risk analysis Section 2.5.4, a 5-point Likert scale was employed in order to capture data for qualitative P-I grids and scatter diagrams (Yin, 2011: 307). The interviewees were able to express their perceptions using five scales: (1) Very low; (2) Low; (3) Medium; (4) High; and (5) Very high. This strategy is supported by the literature review where qualitative risk analysis methods such as P-I grids include numerical values (quantitative) being matched with the ratings (qualitative), as prescribed by Nicholas and Steyn (2011: 370) along with Taroun, Yang and Lowe (2011: 90), when assessing the impact and likelihood of risks. Where permission was granted, the interview proceedings were taped and recorded. The comments were transcribed and where recordings were not allowed, the interviewee responses were noted down. These notes were very legible, tidy, and detailed (Part 2 of Appendix K).

3.4.3 Secondary data

The secondary data were sourced from both published and unpublished studies, including documents and text reviewed across spheres of PM in construction and general management. Library catalogue and online databases of publications were accessed through the Nelson Mandela Metropolitan University, including Emerald Insight, Taylor and Francis, Elsevier, together with recognised conference proceedings.

3.5 Research Credibility

According to Leedy and Ormrod (2010: 28-100), ensuring research validity relates to meeting the study's intended purpose, to match the research realism whereas reliability relates to consistency of the research outcomes. However, according Yin (2011: 3-9) credibility is an important criterion. Triangulation and comparing multiple data sources in search of similar themes are preferred methods in

qualitative research (Leedy & Ormrod, 2010: 100) in order to strengthen research findings (Yin, 2011: 283). For this study through the use of case study protocol and databases, research procedures could be focused on RM data collection (Gray, 2009: 263). Therefore, the availability of the information sources, audio recordings, interview questions, and field notes reflect and represent the credibility of this multiple case study (Leedy & Ormrod, 2010: 137; Yin, 2011: 127-168).

3.6 The Sample Stratum

The sample consists of key personnel from Lesotho's public construction industry. The owners of RMP for each construction project were targeted for interviews in order to ensure that valid perceptions could be obtained. The key areas of interest included building and civil engineering construction projects. According to Gray (2009: 150-152), selections can be random or non-random. In this study, the latter was deemed preferable. Creswell (2007: 129) asserts that when dealing with case studies, a researcher must select a sampling strategy that represents multiple perspectives in order to build sound empirical evidence. According to Yin (2011: 267), the sampling strategy determines the depth of the accumulated empirical detail. Furthermore, Yin (2011: 310) recommends an instrumental case study; to select a case based on its potential applicability to other like-situations is crucial. Therefore, purposive sampling for a research population which is non-random in nature is also helpful in pursuit of a multiple case study. Moreover purposive sampling facilitates the selection of data sources based on their anticipated richness and relevance to inform the research questions (Yin, 2011: 311).

Three major public sector construction projects with contract values exceeding R100 million were purposively selected. The registration status of the main contractor was narrowed to Grade A or Grade B (see Appendix E). Professionals involved in each project were selected based on their exposure to RM. The level of the RM practice provided a key criterion for the sampling strategy; hence the construction project managers, construction managers, quantity surveyors, architects, contract managers, engineers, and their respective assistants were selected as interviewees in each case. With help from the ministry (MOPWT), independent consultants and personnel at the main contractors were contacted and meetings were arranged. The senior projects staff from the MOPWT also

recommended the projects which met the stipulated criteria based on project scope, size, cost, and category. A mix of projects with unique features, locations, and magnitude was thus identified for the investigation. Table 3.1 presents the research sample of 13 interviewees in all three cases. Job titles only and no names of the interviewees are referred to so as to protect their confidentiality. In Case 1, the architect coordinated the research process from the building design services by providing project details throughout the entire research process. Meanwhile, Cases 2 and 3 are represented entirely by the assistant project manager. However, as recordings of interviews were refused by the parties in Cases 2 and 3, the acknowledged field notes were the primary means of capturing the interviews (Part 2 of Appendix K).

Table 3.1: Research sample

Project	**Interviewees' position**	**Organisation/ employer**
Case 1: TCC Tsifa-Limali Local Court Construction	*Principal Engineer; Architect; M&E Engineer; & Quantity Surveyor*	*Building Design Services (BDS)*
	Project manager (PM)	*Main contractor*
	Total 5 ***38% Resp. rate***	***38% Cumulative***
Case 2: LRCP Leshoele-Mathokoane-Bene-Setene Road	*Contracts manager & Project engineer/ assistant PM*	*The Roads Directorate (RD)*
	Assistant PM	*Main contractor*
	Consulting Engineer	*Consultants*
	Total 4 ***31% Resp. rate***	***69% Cumulative***
Case 3: NMMR Nyenye-Mapoteng-Makhoroana Road	*Contracts manager & Project engineer/ assistant PM*	*The Roads Directorate (RD)*
	PM & Contracts manager	*Main contractor*
	Total 4 ***31% Resp. rate***	***100% Cumulative***
TOTAL INTERVIEWEES 13		

Source: the researcher, the BDS, and the RD

3.7 Data Analysis and Interpretation

According to Leedy and Ormrod (2010: 138), the data analysis process in a case study involves organising details about the case, data categorisation, single instance interpretation, pattern identification, synthesis, and generalisation. Yin (2011: 226) states that the more similar the findings across the cases, the more converging themes can be achieved in multiple case studies. The analysis of data is textual in nature while an inductive process is adopted in the study in order to offer descriptive case analysis as suggested by Yin (2011: 240). When inspecting single

instances, conducting interviews, and analysing documents, cross-case synthesis could be used to interpret the elements under each case. This helped in integrating the researched RM theory with the analysed findings from each individual case. The initial approaches were re-evaluated after collecting extensive data because interviewees' perceptions did not address the project phases and impacts on other PMI knowledge areas. The research had to look for new subject matter, conduct further interviews, analyse new documents, and categorise themes according to the literature (Leedy & Ormrod, 2010: 137; Yin, 2011: 183). For example, RM plans had to be analysed to identify their intended purposes, as well as the team responsibilities, methodology, proposed risk tolerance, risk budget allocation, and meeting schedules as outlined by Schwalbe (2011: 429).

In each case, emerging themes and recurring events were categorised and re-evaluated as exemplified by Leedy and Ormrod (2010: 160). Where applicable participants' responses were translated, interpreted, and confirmed with the interviewees in order to ensure the RMP was regularised according to standard practice. For example, the participants were asked to match their methods with the ones stated in the Figure 2.3 framework in order to ensure consistency. To ascertain this, the participants were further asked to demonstrate how the RM methods were performed while their responses were noted down. Following this, the research elements in each case were compared and analysed. These was achieved by inductive reasoning and cross-case generalisation in order to describe the investigated echelon of RM practice for all the three case studies (Leedy & Ormrod, 2010: 34; McBurney & White, 2010: 6; Yin, 2011: 307).

3.8 Criteria for the Admissibility of the Data

Leedy and Ormrod (2010: 91) state that data must be controlled to ensure precision, and adherence to certain criteria, limits, and standards. The primary data were sought from the major public projects in Lesotho from initiation to closeout phases. Independent consultants, contractors, and clients' representatives, who formed the project team for each case project, were part of the study's participant cohort (see Appendix E). The main contractors and subcontractors are registered as grade A or B by the MOPWT. The consultants / professionals have extensive experience in major public projects undertaken in Lesotho.

3.9 Ethical Considerations

According to Leedy and Ormrod (2010: 103), researchers must report their findings in a complete and honest fashion without misrepresenting what they have done or intentionally misleading others about the nature of their findings. Subject to this and the University's rules and regulations, the following principles were observed:

- Non-plagiarising of works;
- Informed consent and right to privacy;
- Protection from harm;
- Adherence to copyright rules;
- Full acknowledgement of sources through citations and references, and
- Originality of the research.

A signed declaration form is provided to attest that the research truly reflects original research work in compliance with the University's set rules and regulations. The research respects the right for anonymity of the participants. Therefore, pseudonyms were used. Confidentiality was assured upon signing the agreement (Appendix B).

3.10 Summary

In order to fully understand the level of RM practice through human interaction across varied cases, a qualitative research approach was selected as the most appropriate option. Participants were selected because of their knowledge and relevance to the project, hence the employment of purposive sampling (Yin, 2011: 310). Semi-structured interviews were conducted to investigate use of the RMP. Mini questionnaires, using a 5-point Likert scale were designed in order to assess the perceptions of interviewees in order to formulate qualitative P-I grids and scatter diagrams. A cross-case synthesis data analysis strategy was chosen because it enables equitable investigation of RM practice components across the embedded multiple cases, while giving deserved analytical attention to unique characteristics of each case. Furthermore, verbatim responses are presented alongside data analysis word-by-word from the recordings, even where translations are made. In order to investigate the level of RM in relation to theoretical framework (Figure 2.3), the study adopts three essential key components, namely; the basis of RM, the RMP,

and the stakeholders' perceptions with regard to the level of RM. Table 3.2 summarises the research methodology adopted for this study.

Table 3.2: Research methodology at a glance

Chapter reference	**Choice**
3.2 Research strategy	Qualitative research
3.2 Approach	Induction
3.2 Research design	Multiple case study
3.4 Data collection techniques	Primary sources; semi-structured interviews plus a minimalistic questionnaire Secondary sources; multiple literature sources
3.5 Research credibility	Triangulation and comparing multiple data sources
3.6 Sampling	Purposive sampling
3.7 Data analysis & interpretation	Cross-case synthesis
3.8 Data admissibility	Primary data sources; project stakeholders
3.9 Research ethical consideration	Adherence to the University research rules and regulations

Source: the researcher

CHAPTER FOUR

FIELD WORK

4.1 Introduction

This chapter presents data collected through document analysis, semi-structured interviews, and mini questionnaires. In each case, the interviewee is presented with the general project information. Next is the sectional presentation based on the adopted research framework's core elements, namely; the basis of RM, the RMP, and stakeholders' perceptions regarding the level of RM.

4.2 Case 1: Tsifa-li-mali Regional Court Complex Project (TCC), Leribe

4.2.1 General project information

The new Tsifa-li-mali Regional Court Complex (TCC) is located in Hlotse town in the Leribe district (see Appendix F). This project belongs to the Ministry of Justice (MoJ) as a result of the Lesotho Government's (GoL) decentralisation of public services initiative. The Ministry of Public Works and Transport-Building Design Services (MOPWT-BDS) was charged with the design and supervisory responsibilities. This four (4) storey building is equipped with a multi-purpose hall, and a cafeteria on the ground floor. Other important rooms include six (6) court rooms (two on each floor), eight (8) holding cells, and sixty-five (65) office spaces. A local A-graded general contractor (GC) was awarded the contract through an open tendering process. The contract entered into between the two parties comprised the bills of quantities (BoQ) with provisional sums. Furthermore, local specialist contractors were nominated to carry out the electrical and air-conditioning (HVAC) subcontracted works.

The construction process started on the 1 October 2013 with a contract value of R89 273 032.69. However, even during the research interviews, this figure had already increased to R101 091 695.55. The initial completion date was scheduled for 29 July 2015. However at the time of conducting the interviews (September 2015), the project was still underway and it was anticipated that it would be completed seven (7) months after the initial anticipated completion date of 29 February 2016 at the projected cost of R113 778 752.55 which was about 27% more than the original contract value.

The research sample for the case study included the design and construction teams. The respective contacts with the key professionals were obtained through the MOPWT-BDS. A total of five (5) interviews were conducted as indicated in the case sample (Table 3.1).

However, the subcontracting teams could not be reached as they mostly did not meet the set sampling requirements. Face-to-face interviews (semi-structured) were mostly conducted in the respective offices of the interviewees in order to achieve the required rapport (Leedy & Ormrod, 2010: 188). Following the strategy highlighted in Chapter 3, field notes were taken while the proceedings were recorded for each interview in order to capture detailed views from the participants (Yin, 2011: 312). The case sources are summed in Table 4.1.

Table 4.1: Project information for Case 1

Type	**Information**	**Supplier**
General project information	Participant's title, contact details, client, contract type, major details of the contracting parties, contract value, risk's P-Is, building description and allocated main rooms, anticipated final cost (in case of overruns), and main reasons for overruns (if any).	MOPWT-BDS (main source)
Project work plan	Project activities schedule, resource allocation, and critical paths.	Main contractor

Source: the researcher

Table 4.1 presents the sourcing of the general project information which is consistent with the project details.

4.2.2 RM basis

Table 4.2 outlines the responses based on the semi-structured questions schedule. However, these were further supplemented by other relevant information which arose from the open-ended questions. The client (BDS) and the construction teams have indicated that they have acquired extensive experience on public construction projects within Lesotho. However, other than the contract signed between both parties, there was no formal document that represented a risk management plan. Therefore, all that was left to do was to manage the project adversities based upon first-hand experiences and without following a formal plan. The descriptions were identical from both parties.

Table 4.2: RM basis and perspectives for Case 1

Element	Response	Response (No.)	Response (%)
Project involvement and experience	*Extensive project involvement and experience (including public projects).*	5	100.0
Definition of RM and its processes (RMP)	i. *'RM is a specialisation branch for dealing with project risks'.*	4	80.0
	ii. *'RMP is a systematic methodology for addressing project specific problems'.*	3	60.0
Availability of a RM plan	*Only contract provisions i.e. contingency allowances forms a basis for RM plan.*	5	100.0
Procedures for managing risks	*Based on the informal methods.*	4	80.0

Source: the researcher

4.2.3 The Risk Management Processes (RMP)

The semi-structured interviews with the design and construction teams were conducted in order to investigate the RMP within the TCC case. However, follow-up open-ended questions were asked in order to gather supplementary information as usual with a qualitative study (Leedy & Ormrod, 2010: 151). The information reveals how risks changed throughout the PLC. The risk identification process in this regard provides the observations and experiences from different interviewees; however hesitant responses have been excluded.

The teams concurred that periodic meetings held in their respective establishments addressed common or newly identified challenges. The sources were usually mapped and individuals volunteered for any necessary action. Intuitive risk pattern matching was a norm for classifying the types of risks; the procedure was based on individual experiences. However, due to the lack of an established project management office (PMO) within the BDS, follow-ups on previous brainstorming sessions often failed to occur. The contractor's project manager concurred with the views of the client team.

4.2.3.1 Risk identification process

Table 4.3 depicts the sporadic use of brainstorming sessions and risk pattern matching in this project. These were informally conducted throughout the PLC.

However, varied risks remained rampant as the project neared the close-out stage. Many risks such as cost and time overruns were found to be products of combined human and environmental-related problems.

Table 4.3: Elements of the project risk identification process in Case 1

Element	Response (No.)	Response (%)
Risk identification process:		
a. Tools and methods: *brainstorming sessions, risk pattern matching.*	4	80.0
b. Frequency of use: *during weekly project progress meetings.*	5	100.0
c. i. Risks types and sources across the PLC **Initiation stage:** *Financial and assumption risks in terms of uncertain project funds owing to inconsistent annual budget allocations.*	5	100.0
Planning and design stage: *Technical risks emanating from incomplete drawings, quantities, and specifications because of human errors (design errors and omissions); Inadequate plan reviews by design team; Poorly defined project's scope.*	5	100.0
Execution stage: *Financial costs due to frequent variations orders, cost overruns due to inclement seasonal weather, late payments, and price escalations; Poor constructability reviews; Other risks including political instability, human errors, red tape, and inadequate supply of local materials and lack of technical skills.*	5	100.0
Closeout: *Time-, cost-, quality-, and administrative-related risks*	5	100.0
ii. Status of risk identification process reviews: *Very ineffective / non-existent*	5	100.0

Source: the researcher

4.2.3.2 Risk analysis and assessment process

Table 4.4 presents a concise evaluation of the entire project risk analysis process throughout the PLC. Individual perspectives from both teams formed a cornerstone on the level of effectiveness and reliability of such practiced methods. Owing to the high level of uncertainty about this process, fewer positive responses were attained from both teams. However the architect, the quantity surveyor, and the contractor's project manager were able to respond to the questions. The interviewees have indicated that this process was undertaken based on personal judgements and consequently, the results were inconsistent. Common project risks were addressed via intuitive pattern analyses. Meanwhile risks that were relatively new to the project were analysed based on informal P-I assessment approaches. These were

chiefly performed because the interviewees' were determined to avoid serious production complexities.

Table 4.4: Elements of the project risk assessment / analysis process in Case 1

Element	**Response (No.)**	**Response (%)**
Risk assessment / analysis process:		
a. Tools and methods: *Casual and intuitive P-I assessments (informal)*	3	60.0
b. i. The level of effectiveness: *Moderate*	2	40.0
ii. The level of reliability: *Low*	2	40.0

Source: the researcher

4.2.3.3 Risk response strategies

In this section, both teams concurred that a critical path method (CPM) generated by project software (Candy and Microsoft Project) were essential tools for responding to the analysed risks (Table 4.5). These tools became the project's risk response standard operating procedures. Beyond these, a contract was a last available option to respond to critical risks such as time and cost overruns. The uniqueness of this option was that the project specific remedies and responsibilities were clearly outlined in case a dispute arose.

Table 4.5 further shows that risks that inherently stemmed from the design or client were retained and the contractor was compensated accordingly, whereas risks emanating from the construction activities were transferred to the contractor. However, the client was forced to share risks that were beyond the contractor. This included time overruns due to late allocation of ministerial funds from parliament, thereby resulting in late payments. According to the client, this financial predicament was a serious issue that required close cooperation with the contractor. Regular meetings were held to negotiate cost effective solutions with the contractor, while each party continued to perform its contract responsibilities. However, these strategies became sluggish and ineffectual due to serious payment delays and inclement weather resulting in long standing times. Hence, in order to continue with the project, negotiations to reconsider the working terms became the only way forward for both parties.

Table 4.5: Project risk response strategies in Case 1

Strategy	Response (No.)	Response (%)
Risk response strategies:		
a. Project risk response plan: *a CPM was normally used while the contract terms and conditions outlined which risks could be accepted, or transferred to the other party*	5	100.0
i. The formal risk response strategies: *these strategies are to be formalised within contract terms and conditions.*	4	80.0
At each project phase, the following strategies occur:		
Initiation stage: *Nothing happens*	4	80.0
Planning and design stage: *Contract is drafted to address project specific challenges. The contractor issues a detailed work programme indicating the critical paths and the WBS.*	5	100.0
Execution stage: *Scheduled meetings, progress reports, and evaluations, the necessary actions are initiated and implemented.*	4	80.0
Closeout: *Penalties, redress, or termination action may be issued, depending on the magnitude of the case*	5	100.0
b. Type of support toward risk response: *No specific form of support*	5	100.0

Source: the researcher

4.2.3.4 Risk monitoring and controlling process

Table 4.6 presents the risk monitoring and controlling process, with a brief emphasis on tools, methods, and the perceived levels of their usefulness. Project technical performance analysis was a standard requirement for risk monitoring. This was carried out in weekly progress meetings to enable all stakeholders to monitor the known risks.

Table 4.6: Elements of the project risk monitoring and controlling process in Case 1

Element	Response (No.)	Response (%)
Risk monitoring and controlling process:		
a. Tools and methods: *Project technical performance measurement and weekly progress meetings*	5	100.0
b. i. The level of effectiveness: *Low*	3	60.0
ii. The level of reliability: *Low*	2	40.0

Source: the researcher

4.2.4 RM perceptions

Succinct individual perceptions regarding the risks' P-I across the PLC are presented in Table 4.7. This follows the qualitative P-I risk analysis methodology outlined in Chapter 2. The P-I risk analysis is given qualitative ratings (low to high) with the RPFs expressed in numerical values (Nicholas & Steyn, 2011: 370). Similarly, this model applies in presenting the risks' impact perceptions on the other knowledge areas in Table 4.8 as recommended by Schwalbe (2011: 433).

Table 4.7: Perceptions regarding project risk P-I across the PLC in Case 1

Phase / Interviewee	**Architect**	**Quantity surveyor**	**Structural engineer**	**M&E engineer**	**Contractor's PM**
Likelihood:					
Initiation	Medium	Very low	Very high	Very high	Very low
Planning & Design	Medium	Medium	Very high	Very high	Very low
Execution	Low	High	Very high	High	High
Closeout	High	Medium	Very high	High	Very high
Impact:					
Initiation	Medium	Very low	Very high	Very high	Very low
Planning & Design	Medium	Medium	Very high	Very high	Very low
Execution	Low	High	Very high	High	High
Closeout	High	Medium	Very high	High	Very high

Source: the researcher

Table 4.8: Perceptions regarding risks' impacts on other PMI Knowledge Areas in Case 1

KAs / Interviewee	**Architect**	**Quantity surveyor**	**Structural engineer**	**M&E engineer**	**Contractor's PM**
Impact:					
Integration	Medium	Very high	Very high	Very high	Very high
Scope	Very high	High	Very high	Very high	High
Time	Very high	Very high	Very high	Very high	Very high
Cost	Very high	Very high	Very high	Very high	Very high
Quality	Medium	Very high	Very high	Very high	Low
Human resources	Low	Very high	Very high	High	Low
Communications	Low	Very high	Very high	Medium	Medium
Procurement	Very high	Very high	Very high	Very high	Very high

Source: the researcher

Note: The verbatim responses from each interviewee regarding the recommendations and observations are presented in Appendix K.

4.3 Case 2: Leshoele–Mathokoane–Bene–Setene Road Construction Project (LRCP), Leribe

4.3.1 General project information

This new bituminous road construction project was initiated by the GoL through the MOPWT. The new 40km road network links the existing Main North 1 (near the Hlotse–Leribe district administration centre), Mpharane, and the Nelson Mandela roads as indicated in Appendix G. The road project is divided into these three routes which meet up at Mositi village, thereby serving the farming communities around this area. A local registered A-Graded contractor from China was awarded the contract with a bid value of R535 455 183.19. There was no subcontracting in this project. The project started on the 30 April 2015 and was initially anticipated to be completed on the 12th September 2015. However due to time overruns and other issues outlined in the following sections, the completion date was extended to the 25th October 2017.

The Roads Directorate (RD) under the MOPWT was tasked with the design and supervision of the works. However, a consultant was engaged to relieve the RD with the technical design and supervisory aspects of the project as there were other road construction projects running concurrently. Meanwhile, it is worth noting that both the consultant and contractor's assistant project manager were not comfortable with the recording of the interview session.

4.3.2 RM basis

The RD interviewees indicated that RM for this project was overseen by its PMO structure, as indicated in Figure 4.1. However, Table 4.9 covers the concise responses and existing pragmatic stakeholders' initiatives towards project risk management. The interviewees in this case included the main contractor's assistant project manager, the RD's PMO assistant project engineer (representative) and the consulting engineer. An inspection of the main contractor's generic RM plan (translated from the original Chinese version) revealed that the processes were chiefly adapted from the PMI which offers project managers professional credential and a RM framework (PMI, 2013: 320). This was also confirmed by the assistant project manager. The adopted RM framework clearly indicated the type of people to be involved, and the project monitoring and evaluation procedures. The assistant

project manager also mentioned that project risks were grouped according to their sources and mitigation measures highlighted so that the main contractor's PMO could revisit and apply the strategies. Relationships among the stakeholders were clearly outlined and coordinated in concise graphical forms. Furthermore, the assistant project manager mentioned that he was familiar with the contents of the RM plan as he partly participated during its localisation process (claim not substantiated). He also indicated that he was aware of the common project risks in Lesotho, especially those related to government and human resources. One of the planning tools adopted was a work programme which integrated the RM with the activity schedules as explained by the main contractor's PMO. Generic risk response strategies were highlighted in the programme which included frequent reporting to the head office.

Table 4.9: RM basis and perspectives for Case 2

Element	**Response**	**Response (No.)**	**Response (%)**
Existence of a project management office	*Both the RD and the main contractor had a PMO.*	4	100.0
Project involvement and experience	*Extensive*	4	100.0
Definition of RM and its processes (RMP)	i. '*RM is about managing projects in such a manner as to tackle and minimise risks in order to successfully achieve the project goals*' – **the RD**.	2	50.0
	'*RM is a practice of diagnosing and controlling problems that affect the work and progress in a projec*t'– **the main contractor.**		
	ii. '*RMP are sets of staged instruments for RM*' – **the RD.**	2	50.0
	'*RMP are detailed processes meant to be adopted when managing the risks in a project*' – **the main contractor.**		

Availability of a RM plan	*The main contractor's project RM and work plan, and contract provisions, i.e. contingency allowances form a basis for the RM plan.*	3	75.0
Procedures for managing risks	*As above.*	4	100.0

Source: the researcher

4.3.3 The RMP

The RD's PMO structure was as follows;

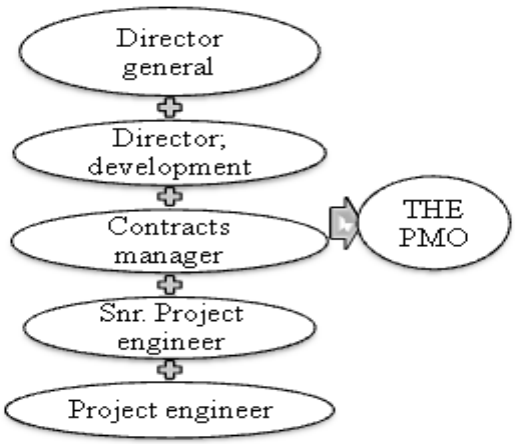


Figure 4.1: Case 2 - the RD PMO hierarchy
Source: the researcher

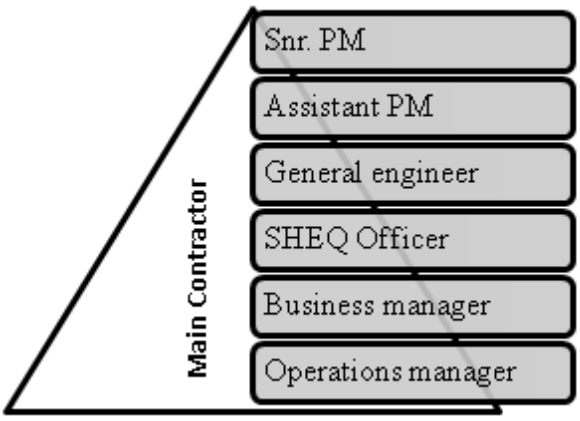


Figure 4.2: Case 2 - the main contractor's PMO hierarchy

Source: the main contractor

Figure 4.1 indicates the hierarchy within the RD PMO where the director general is said to be steering the departmental projects. The divisional development director is

charged with coordinating the aspects of the project between the senior departmental management and the project team where the contracts manager is the head. The contracts manager herein is responsible for the project specific details and contract management. Meanwhile the main contractor's PMO is constituted of the members indicated in Figure 4.2.

4.3.3.1 Risk identification process

Through the generic RM document review, the main contractor's assistant project manager indicated that this process involved procedures outlined in diagrammatic forms in documents. The steps followed in identifying risks include the following; analysing the individual strengths and weaknesses of a particular project task, the taking of necessary procedures conforming to the SWOT analysis methodology, and the establishing of communication routes. These were narrated from the framework as illustrated in the generic Chinese written document. The risks the main contractor experienced were mostly security related. Owing to the remoteness of the construction site, thieves would occasionally steal construction property and sometimes attack the security personnel. As the roads cut through community fields and homes, meetings were prearranged with the community council and headmen to discuss relocation and compensatory terms. However, the relocation of graveyards required specialised expertise and extensive engagements.

Meanwhile, the consultants were concerned about the nature of the terms of reference (TOR) for the project design and bidding as they were unclear and had numerous project specific omissions. Ultimately, these had an effect on the other project stages and performance. Table 4.10 provides a concise presentation of risks' identification methods, tools, and risk sources encountered at the different project stages. According to the RD's responses, contract data reviews, brainstorming techniques and historical data analysis were common methods utilised for risk identification. The RD's assistant project engineer mentioned that the project funding remained an uncertain financial aspect that had a huge impact on the cash flow planning and monitoring throughout the PLC. There was also a consistent mention of politically related problems affecting the project due to the reigning instability in the kingdom.

Table 4.10: Elements of the project risk identification process in Case 2

Element	Response (No.)	Response (%)
Risk identification process:		
a. Tools and methods: *SWOT analysis, brainstorming sessions, contract document reviews, historical data analysis, and case comparison.*	3	75.0
b. Frequency of use: *during weekly project progress meetings.*	3	75.0
c. i. Risks types and sources across the PLC: **Initiation stage:** *Financial and assumption risks due to uncertain funds to be allocated by parliament and accuracy thereof, resettlements and property compensation; political risks; assumption risks due to unclear project TORs for design and specifications;*	4	100.0
Planning and design stage: *Political instabilities with direct effect on project financing; physical site related risks due to site allocation and access; quality and technical design risks due to unclear project TORs for design and specifications.*	4	100.0
Execution stage: *Financial risks due to cost overruns, price escalations and design variations; human resources related risks due to shortage of skills; environmental or physical challenges due to unforeseeable geotechnical conditions; political instability risks; security risks due to site pilfering; technical and quality risks due to frequent design changes.*	4	100.0
Closeout: *Time-, cost-, quality-, and political-related risks.*	4	100.0
ii. Status of risk identification process reviews: *Efficient project specific reviews*	4	100.0

Source: the researcher

4.3.3.2 Risk analysis process

The response from the main contractor indicated that following the SWOT analysis model adopted above, they were more comfortable with the risk impact analysis model that they specifically developed for the project. According to their generic model, every member of the PMO was involved in evaluating any problem encountered. This was followed by detailed assessment reporting without any format to the senior project manager who could report to the head office in case the problem was too severe. As stated, the head office was manned by different professionals who were able to assess the reported problem and recommend how best to address the risk. The procedure entailed re-investigating the sources of risks before they were analysed. However the onus for analysing risks rested on the

senior project manager. Meanwhile the RD depended on tools such as the rainfall formula to assess the effects of precipitation on the project's performance. These tools were recognised as being effective and reliable by both parties. The responses are summarised as in Table 4.11.

Table 4.11: Elements of the project risk assessment/ analysis process in Case 2

Element	**Response (No.)**	**Response (%)**
Risk assessment/ analysis process:		
a. Tools and methods: *rainfall formula, risk impact analysis.*	3	75.0
b. i. The level of effectiveness: *High.*	3	75.0
ii. The level of reliability: *High.*	3	75.0

Source: the researcher

4.3.3.3 Risk responses strategies

According to the responses from the RD, a contract was considered to be project specific in order to address any issues that might arise between the parties concerned. Among the trusted strategies indicated in Table 4.12 was risk transfer, which normally translates into conveying the burden from the department to the main contractor. This normally occurs when the main contractor encounters problems beyond the scope of the contract or when the nature of the problems remains internal. The reason indicated for relying on contract terms was that the parties could regularly revisit the clauses and try to remedy the problems before encountering any serious risk escalation on the project. Other strategies included risk sharing and acceptance, depending on the nature of risks, i.e. whether negative or positive. The RD was always eager to accrue benefits from positive risks.

When submitting the bid, the main contractor was mandated to furnish adequate collateral from the reputable financier, and also proof of public and works insurance cover. Among other strategies, the main contractor maintained closed ties with the communities and the government agencies. When dealing with the political uncertainties, the main contractor had to make use of reliable information sources on political developments, while setting aside a contingency budget. Furthermore, liaising with the local council in order to recruit skilled workers was a very cost effective measure. These workers were employed under strict disciplinary and performance terms while continually being further skilled by the main contractor (employer).

Meanwhile, the main contractor had to entertain some regulatory terms of the contract and issue warnings in case any foreseeable problems happed to arise. This included notifications for design deficiencies and omissions prior to work commencement. Variation orders would be signed and approved for the contractor to price. Any outstanding matter would be dealt with formally in the project meetings where minutes were taken. This was meant to form a basis for any future recourse needs. Ultimately, the risks were dealt with within the context of the contract terms and conditions. Both parties had agreed to abide by the set terms and conditions without any breach being committed. The collective response strategies are summarised in Table 4.12.

Table 4.12: Project risk response strategies in Case 2

Strategy	**Response (No.)**	**Response (%)**
Risk response strategies:		
a. Project risk response plan: *Cost-plus fixed fee contract (quantities plus fee) and a critical path method (CPM). Risk transfer, sharing, and acceptance strategies are employed.*	3	75.0
i. The formal risk response strategies: *Contract terms and conditions/ P&Gs (inclusive of insurances).*	3	75.0
At each project phase, the following strategies occur:		
Initiation stage: *Detailed site investigation*	4	100.0
Planning and design stage: *Contract is drafted to address project specific challenges and responses. Strategies are clearly outlined including, e.g. an adoption of a rainfall formula and its limitations, delay clause inclusion, secure project security plus adequate work and public insurance; The contractor investigates the site, inspects the extension clause, re-measures the priced BoQ, and issues a detailed work programme indicating the critical paths and the WBS.*	4	100.0
Execution stage: *Scheduled meetings, progress reports, and evaluations, the necessary actions are initiated and implemented. Risks are transferred, shared, accepted, or mitigated accordingly. The contractor stringently implements SHEQ regulations and site security.*	4	100.0
Closeout: *Penalty, redress, or termination action may be issued depending on the magnitude of the case.*	3	75.0
b. Type of support toward risk response: *Regularly support sought from consultants.*	2	50.0

Source: the researcher

4.3.3.4 Risk monitoring and controlling process

Table 4.13 summarises the risk monitoring tools and methods adopted in this construction project. The response from the main contractor affirms that risk reassessments were commonly practiced when controlling the surfacing risks. Yet again, the reliance on the project management abilities in reporting was extensively acknowledged. Therefore, the project manager became the cornerstone in monitoring and controlling the project problems. Certainly, the interviewees gave positive credit to these methods that were successfully planned and executed by the project team.

Table 4.13: Elements of the project risk monitoring and controlling process in Case 2

Process	**Response (No.)**	**Response (%)**
Risk monitoring and controlling process:		
a. Tools and methods: *Sprint planning, project progress, and weekly status meetings; risks review and reassessments; PM highlight reports.*	3	75.0
b. i. The level of effectiveness: *High.*	3	75.0
ii. The level of reliability: *High.*	3	75.0

Source: the researcher

4.3.4 RM perceptions

The participants graded their perceptions relative to the risks P-I throughout the PLC. However, the project was still at the construction stage and the participants were unable to provide inputs for the closeout stage. The individual perceptions are presented in Table 4.14. Furthermore, the perceived impacts of risks on other facets of the project are presented in Table 4.15. The participants commented on how each area was being affected by the identified risks across the PLC. The verbatim responses from each interviewee regarding their recommendations and observations are presented in Appendix K.

Table 4.14: Perceptions regarding project risk P-I across the PLC in Case 2

Phase / Interviewee	Contracts Manager	Project engineer	Assistant project manager	Consultant
Likelihood:				
Initiation	Very low	Very low	High	High
Planning & Design	Medium	Very low	High	High
Execution	High	High	Low	Very high
Closeout	-	-	-	-
Impact:				
Initiation	Very low	Very low	High	High
Planning & Design	Medium	Very low	Very low	High
Execution	High	High	High	Very high
Closeout	-	-	-	-

Source: the researcher

Table 4.15: Perceptions regarding risks' impacts on other PMI Knowledge Areas in Case 2

KAs / Interviewee	Contracts Manager	Project engineer	Assistant project manager	Consultant
Impact:				
Integration	High	Very high	Very low	Low
Scope	Medium	Medium	Very low	Very high
Time	Very high	Very high	Very low	High
Cost	Very high	Very high	Unsure	High
Quality	High	Medium	Very low	High
Human resources	Medium	Very high	Medium	Unsure
Communications	High	Very high	Very low	Unsure
Procurement	Medium	Very low	Very low	Unsure

Source: the researcher

4.4 Case 3: Nyenye–Mapoteng–Makhoroana Lot1 Road Rehabilitation Project (NMMR), Leribe

4.4.1 General project information

This 21.5km Nyenye–Mapoteng (NMMR) Lot 1 road rehabilitation project spanned the Leribe and Berea districts as illustrated in Appendix H. A local A-graded registered contractor was awarded the contract at a bid value of R181 513 698.87. The project which was subdivided into two parts (Lot 1 and 2) started from Maputsoe town's industrial area which is named Nyenye; it is situated where the Main North 1 road adjoins the Mapoteng road to the Makhoroana village in the

foothills of the Maluti mountains. The rehabilitation process involved resurfacing, widening of the new road, new road signage, and installation of storm water drainage systems. Lot 1 was chosen for the research investigation as it was nearing completion.

This project started on the 12 June 2015 and completion was anticipated for 12 September 2015. No changes were anticipated at the time of conducting the interviews in terms of cost and time overruns. The Roads Directorate (RD) under the MOPWT was in charge of the project with the backing of consultants for design and supervision. However, the consultants were reluctant to participate in this research exercise. On the other hand, the client's (RD) and construction teams fully participated in the research process and were cooperative in providing useful responses. The resultant general project information is shown in Table 4.16.

Table 4.16: Project information for Case 3

Type	Information provided	Supplier
General project information	Participant's title, contact details of stakeholders, client, contract type, major details of the contracting parties, contract value, risks' P-I, and the road project description.	MOPWT-RD (main source)

Source: the researcher

4.4.2 RM basis

Table 4.17 presents the basic elements relative to the availability of the interviewees' RM policies and procedures that had been set in place for systematically managing risks in this project. The RD provided a list of personnel directly in charge for dispensing project specific RM duties. The department has further confirmed the existence of a project management office (PMO) (c.f. Figure 4.1).

Table 4.17: RM basis and perspectives for Case 3

Element	Response	Response (No.)	Response (%)
Existence of a project management office	Both the RD and the main contractor had a PMO.	2	50.0
Project involvement and experience	Extensive project involvement and experience (including public projects).	4	100.0

Definition of RM and its processes (RMP)	i. '*RM is about managing projects in such a manner as to tackle and minimise risks in order to successfully achieve the project goals*' – **the RD**. '*RM is a systematic approach that is used for minimising the project challenges*' – **the main contractor.** ii. '*RMP are a set of staged instruments for RM*' – **the RD.** '*The RMP summarises the series of steps taken when managing risks*' – **the main contractor.**	4 2	100.0 50.0
Availability of a RM plan	*Contract provisions, i.e. contingency allowances forms a basis for the RM plan.*	4	100.0
Procedures for managing risks	*As above.*	4	100.0

Source: the researcher

Meanwhile, the main contractor had the contracts manager, the construction manager, the quantity surveyor, the SHEQ officer, and the site agent as the members of the PMO. The information represents responses from both the client and construction teams. It is worth noting that due to the centralised nature of the RD projects, the project specific information applied to the project teams entirely thanks to coordinated efforts from the PMO. Furthermore, the strong interconnection of information was a result of mandatory project requirements set for prospective bidders. Table 4.17 further illustrates the descriptions given for both RM and the RMP. The client and the main contractor's team gave two descriptions which are given verbatim. The intention is to show exactly how each party understood these core principles.

4.4.3 The RMP

The information obtain in Case 3 is relatively consistent with that provided in Case 2 in terms of how the client / RD practiced RM. Despite the fact that the cases

varied, the set semi-structured interview schedule helped in extracting the most relevant research information. The tables depict consistent responses from different interviews in simplified forms, while also underlining the response rates. Therefore, the RMP was successfully studied as follows.

4.4.3.1 Risk identification process

The interviewees on this case study provided the information summarised in Table 4.18. As indicated in 4.4.2 and 4.4.3, this information has been collected from the client and the construction team. Owing to the nature of the information overlaps, the responses were quite consistent across both teams. The response from the client's team indicated that risks' exposures on the Lesotho roads construction projects are normally comparable. It was also mentioned that the majority of the risks that are identified during the construction stage are environmental and financial in nature. This being the case, more weight could be directed on the identification process during the execution phase.

Table 4.18: Elements of the project risk identification process in Case 3

Element	**Response (No.)**	**Response (%)**
Risk identification process:		
a. Tools and methods: *Brainstorming sessions, contract document reviews, historical data analysis, case comparison and to some extent SWOT analysis.*	3	75.0
b. Frequency of use: *Weekly project progress meetings.*	3	75.0
c. i. Risk types and sources across the PLC:		
Initiation stage: *Financial and assumption risks due to uncertainty of funds to be allocated by parliament and accuracy thereof coupled with political risks.*	3	75.0
Planning and design stage: *Political instabilities with direct effect on project financing; Physical site related risks due to site allocation/ acquisition and access right of way permission; time risks due to extensive community resettlements.*	4	100.0
Execution stage: *Financial costs due to price escalations; cost overruns due to inclement seasonal weather conditions, relocation costs, maintenance, royalties, and price escalations; Human resources related risks due to shortage of skilled workers; Health related risks due to high TB exposures; Environmental or physical related risks associated to unsustainable quarry pits and unforeseeable geotechnical conditions; Technical risks due to mechanical earthwork plant breakdown and, Political instability.*	4	100.0
Closeout: *Time-, cost-, and administrative-related risks.*	4	100.0

ii. Status of risk identification process reviews: *Fairly effective.*	4	100.0

Source: the researcher

4.4.3.2 Risk assessment/ analysis process

The responses from this process are presented in Table 4.19. The client's team as represented by the project engineer and the contracts manager provided this information, which indicates that as regards practicality and consistency, they were always in charge of assessing common risks. For example, a rain formula tool was used to assess precipitation levels and impacts on the project. The results were usually communicated to other project stakeholders for their deliberation. Meanwhile, common risks were usually tracked, ranked and given due attention while pertinent solutions were reviewed accordingly but without recourse to any formal system. According to the client's team, regular team discussions were the usual platforms for such assessment exercises.

Table 4.19: Elements of the project risk assessment/ analysis process in Case 3

Element	**Response (No.)**	**Response (%)**
Risk assessment / analysis process:		
a. Tools and methods: *Rainfall formula, and risk tracking.*	2	50.0
b. i. The level of effectiveness: *High.*	2	50.0
ii. The level of reliability: *High.*	2	50.0

Source: the researcher

4.4.3.3 Risk response strategies

Table 4.20 presents responses pertaining to project risk response strategies. The client's project engineer confirmed that design related risks and any other positive risks remained their responsibilities. These risks, for example, might be attributed to a difficulty in accessing and occupying the site by the contractor. The client's team also indicated that most of the project's positive risks were initiated in order to maximise the project outcomes. Other strategies included risk sharing and acceptance. A cost-plus fixed fee (CPFF) or quantities plus fee contract type was selected in order to share the possible effects of cost overruns which were beyond the contractor's control. Negative project risks were normally transferred to the contractor where any risk emanating from construction related activities or labour

actions were to be covered. As mentioned by the RD, the preliminaries and general (P&Gs) must include adequate insurance cover at the bidding stage.

Effects due to changing costs were often shared between the parties, depending on their types and sources. However, substantial facts from the contractor were often required for submission before a decision was made. Practical responses from the client's team showed that risks were sometimes reduced by accelerating the construction time through the CPM, improving risk communication, and increasing project monitoring capacity. Through communication, the parties would normally discuss the most cost effective options to be adopted.

Table 4.20: Project risk response strategies in Case 3

Strategy	**Response (No.)**	**Response (%)**
Risk response strategies:		
a. Project risk response plan: *Cost-plus fixed fee contract (quantities plus fee) and a critical path method (CPM). Risk transfer, sharing, and acceptance strategies are employed. P&Gs inclusive of insurances, work risks, indemnities, security and work risks.*	3	75.0
i. The formal risk response strategies: *Contract terms and conditions.*	4	100.0
At each project phase, the following strategies occur:		
Initiation stage: *Nothing happens.*	2	50.0
Planning and design stage: *Project-specific contract's formulation. Strategies are clearly outlined including the criteria e.g. an adoption of a rainfall formula and its limitations. The contractor issues a detailed work programme indicating the critical paths and the work breakdown structure.*	3	75.0
Execution stage: *Scheduled meetings, progress reports, and evaluations, the necessary actions are initiated and implemented. Risks are transferred, shared, accepted, or mitigated accordingly.*	3	75.0
Closeout: *Penalty, redress, or termination action.*	3	75.0
b. Type of support toward risk response: *Consultancy services sought to assist the PMO.*	2	50.0

Source: the researcher

4.4.3.4 Risk monitoring and controlling process

Relative to Table 4.21, the client's project engineer mentioned that they continually monitor the project risks while offering cheaper solutions for the project. For example, requests for project time extensions due to natural causes could be allowed at a cost without profit claim e.g. the contractor was allowed as per the contract to claim costs incurred due to unforeseen geotechnical conditions.

However, consultants were engaged for additional analysis and recommendations prior to the finalisation of such extensions.

Furthermore, the contractual terms and conditions were project specific so as to address project-borne risks. For example, provisions for periodic health and environmental inspections were strictly regulated by the relevant government ministries. The contractor was required to ensure that proper medical tests for new workers were undertaken prior to work, especially tuberculosis' (TB) screening tests. A response from the contractor also stated that any health related illness incurred due to work exposure was to be reasonably covered and compensated for by the contractor, in accordance with the contract terms and stipulated regulations.

Table 4.21: Elements of the project risk monitoring and controlling process in Case 3

Process	**Response (No.)**	**Response (%)**
Risk monitoring and controlling process:		
a. Tools and methods: *project progress and weekly monitoring meetings.*	4	100.0
b. i. The level of effectiveness: *effective.*	4	100.0
ii. The level of reliability: *reliable.*	3	75.0

Source: the researcher

4.4.4 RM perceptions

The client's team indicated that the level of RM within the RD was satisfactory, whereas the construction team was worried that their problems were always compounding. In Table 4.22 the views from interviewees regarding risks' P-I across the project are presented.

According to the interviewees, risks' P-I tend to escalate from the initiation stage due to the increased level of activities in the construction phase of the project. The construction team indicated that the geographical terrain and inclement weather required them to employ more resources. This ultimately had a negative effect on the cash flow due to accrued transport costs, standing time, mechanical repairs and malfunctions, and the ultimate production slump. They further concurred to the effects of extreme rainfall and cold seasons that posed serious production ramifications during the execution phase.

Table 4.22: Perceptions regarding project risk P-I across the PLC in Case 3

Phase / Interviewee	Contracts Manager	Project engineer	Contractor's Contracts manager	Construction manager
Likelihood:				
Initiation	Very low	Very low	Very low	Very low
Planning & Design	Medium	Very low	Medium	Medium
Execution	High	High	Very high	Very high
Closeout	Medium	Very high	High	Medium
Impact:				
Initiation	Very low	Very low	Very low	Very low
Planning & Design	Medium	Very low	Medium	Medium
Execution	High	High	Very high	Very high
Closeout	Medium	Very high	High	Medium

Source: the researcher

From the experiences outlined by the client's team/ PMO, risks can have a tremendous effect on the success of other project sectors. The team feared that this contagious effect could ultimately cripple the project. As summarised in Table 4.23, the PMO had experienced difficulties in other project departments, especially during the construction phase. The team understood that these challenges demanded particular attention before they spread across other departments, especially those related to the human resources. Shortage of qualified project managers within the RD was cited as having greatly affected the coordination of tasks within the PMO.

Meanwhile, the construction team had discredited the political, regulatory, and environmental situations in Lesotho as the major sources of chaos across the facets of the project. Lack of clear construction regulations was believed to have hampered the smooth running of the project. Furthermore, they mentioned that the economic environment was not conducive for the smooth running of this project as most specialised plant for road construction had to be sourced from South Africa. The verbatim responses from each interviewee regarding their recommendations and observations are presented in Appendix K.

Table 4.23: Perceptions regarding risks' impacts on other PMI Knowledge Areas in Case 3

KAs / Interviewee	Contracts Manager	Project engineer	Contractor's Contracts manager	Construction manager
Impact:				
Integration	High	Very high	Very high	Very high
Scope	Medium	Medium	Medium	Medium
Time	Very high	Very high	Very high	Very high
Cost	Very high	Very high	Very high	Very high
Quality	High	Medium	Very high	Very high
Human resources	Medium	Very high	Very high	Medium
Communications	High	Very high	Very high	Low
Procurement	Medium	Very low	Very high	Medium

Source: the researcher

4.5 Summary

The research data were successfully collected through semi-structured interviews where perceptions were rated using five-point scales to arrive at the qualitative P-I grids and scatter diagrams presented in the following Chapter Five. Only interviewees' titles were indicated to succinctly present responses to the reader while observing their confidentiality.

CHAPTER FIVE

ANALYSIS

5.1 Introduction

In this chapter, the findings reported in Chapter 4 through the research instruments outlined in Chapter 3 are analysed within the context of the theoretical framework provided in Chapter 2. Each case analysis is succinctly presented using qualitative P-I grids prior to the cross-case analysis in order to direct readers to the conclusions that follow.

5.2 Case Analyses

5.2.1 Case 1: Tsifa-li-mali Court Complex Project (TCC)

5.2.1.1 The basis of project Risk Management in Case 1

In Table 4.1 (page 27), the basis of RM under this case is presented following the responses from the interviews which indicate that the interviewees have extensive public project experience in Lesotho. However in terms of the required unanimous empirical description of RM, the elements of how the specialisation was carried out relative to the expected outcomes are omitted, thus rendering the description inadequate for consideration in an academic context. Garlick (2007: 3) mentions that RM is a process involving the making and implementing of decisions while demonstrably taking account of risk potential for different future outcomes. Based on this description, it is therefore evident that the interviewees are not fully aware of the full extent of RM requirements.

It is generally concurred that an effective RM plan must clearly specify the methodology for managing risks, roles and responsibilities, allocation of budgets and schedules, and the subsequent procedures. However, in this project the RM plan was non-existent, despite the extensive experience of project stakeholders. The PMO was not established; hence no responsibilities for RM had been assigned. The practice of brainstorming sessions had inevitably resulted in minimal RM impact due to the lack of clearly defined methodologies. Therefore, the basis for RM was non-existent in this project. Some of the verbatim responses (they speak for themselves) were as follows:

> "*There seem to be a risk management plan from the contractor, but I am sure there should be a correct template that needs to be followed… our contractors do have the project managers, but… the standards seem to be low [laughing]… incorrect practices… they really seem to miss the procedures… there are no templates…*"

5.2.1.2 The RMP

According to the reviewed literature, the RMP entails clearly defined steps that are required for effectively managing risks in a project. Figure 2.3 (page 17) has clearly outlined these processes as a yardstick for assessing the adopted project RMP. Each process is awarded a range of grades from '*Very low*' to '*Very high*'.

5.2.1.2.1 Risk identification

The risk identification processes adopted in this project show that only two methods have been adopted, despite the fact that researchers have encouraged multiple use of different methods such as the Delphi technique, interviews and document reviews among others (Creedy, 2006: 28; Ke, Wang & Chan, 2012: 678; Nicholas & Steyn, 2011: 366; Schwalbe, 2011: 434-436). However these were not formally executed in order to guarantee the expected reliable results. The interviewees have shown limited knowledge with respect to how to formally identify risks. Therefore, the identified number of risks should have been more than the ones listed across the entire project phases. Certainly the level of risk identification process was very low, due to the fact that only a few informal methods were used; moreover there were no clear standards and support apparent, with respect to how the identification process was carried out.

5.2.1.2.2 Risk analysis / assessment

The tool used by the interviewees indicate a significant reliance on P-I grids which, according to Taroun, Yang and Lowe (2011: 90), generate unnecessary uncertainty by over-simplifying the estimates. These were further found to be neglecting the mediating influence of project systems (Zhang, 2007 cited by Taroun, Yang & Lowe, 2011: 90). Therefore, the risk assessment and analysis processes being utilised for this project seem to be inadequate, together with the high level of uncertainty with regard to appropriate tools and methods that could be used. One of the verbatim responses was:

> "*Well the meetings are there but nothing is carried out formally [laughing]… no one cares to implement.*"

5.2.1.2.3 Risk response strategies

As Schwalbe (2011: 447) points out, effective risk response strategies must be developed in order to reduce negative risks, while at the same time enhancing positive risks. Furthermore, Schwalbe (2011: 448-449) promotes multiple use of response strategies pertinent to the type of risks encountered. According to the interviewees, the CPM plus the contract terms were used as the cornerstones for a process of mitigating, transferring, and accepting the risks. Scheduled project meetings, and work breakdown structures (WBS) were regularly utilised throughout the PLC to mitigate and avoid the risks. According to the responses, technical risks were mostly transferred and partially mitigated. On the other hand financial risks were accepted or transferred, while *force majeure* related risks were generally also accepted or transferred. Clearly, there was no question of risks being shared. This implies that even though there were strategies in place for responding to risks, these were insufficient for ascertaining a comprehensive project risk response. There was no indication given with respect to how other analysed risks were dealt with. To confirm this, according to one interviewee:

> "*Beside the fact that this is something new to me… it will be impossible to implement such initiatives because we rarely meet or discuss such problems at the project meeting level… there is no motivation.*"

Therefore, it can be concluded that the risk response strategies within this project were operating at a very low level.

5.2.1.2.4 Risk monitoring and controlling

As pointed out by Schieg (2006: 80), controlling risks depends on determining their influence in the context of the risk analysis. Therefore, the analysed risks are supposed to be dealt with thoroughly at this stage by utilising appropriate tools. The informal technical performance measurements and progress meetings employed for this project seemed unreliable. The interviewees attest to the fact that the results were not effective and that solutions were not reached. When assessing the responses, it can be concluded that the approach employed lacked the basic elements of risks monitoring and controlling that are required. Therefore, one interviewee said of the risk monitoring processes employed:

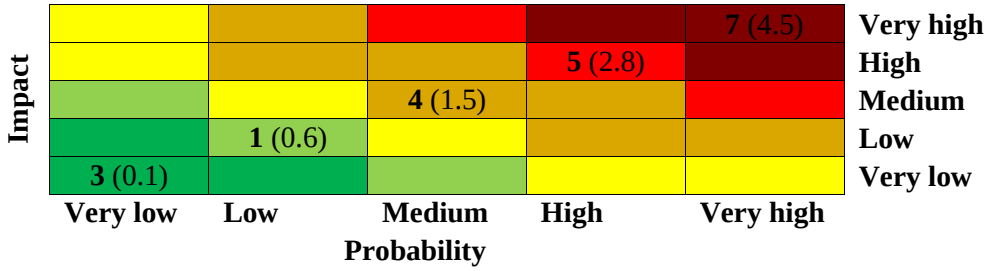
> "*It's really a non-existing aspect in this department… you can ask anyone around… we are not sure about that sir.*"

This meant that the level of this item remained very low.

5.2.1.3 RM perceptions

The RM perceptions were gathered from five (5) interviewees using a 5-point Likert scale (from 1 minor to 5 major) as indicated in a qualitative P-I grid in Table 5.1. For the project initiation stage two (40%) interviewees rated the P-I '*Very low*' and '*Very high*' respectively, with one (20%) '*Medium*' score. The planning and design stage had two (40%) interviewees rating '*Medium*' and '*Very high*' respectively, while one rated this stage '*Very low*'. The execution stage was rated '*High*' by three (60%) interviewees, while others each rated it '*Very high*' and '*Low*'. The closeout stage saw two interviewees rating '*High*' and '*Very high*' respectively, while one rated it with a '*Medium*' score. From the analysis of scores, it can be inferred that the level of RM practice was very low, hence the negative outcomes incurred.

Table 5.1: **S**ummary of risk P-I across the PLC in Case 1



Source: the researcher

Figure 5.1, which is extracted from Table 4.8, indicates how interviewees perceived the impact of risk on the other functional areas of the project. A number of red dots (representing RPFs or P-Is) appear to be dominant at the top tier of the diagram implying that the project is in serious trouble according to the participants' perceptions (response rate on the Y-axis) The areas regarded to be highly affected include integration which four (80%) interviewees rated '*Very high'* and one (20%) interviewee rated it at the '*Medium*' level; scope was rated '*Very high*' (four interviewees) and '*High*' by one interviewee, while quality was rated '*Very high*' (three interviewees) and time, cost, and procurement were each rated '*Very high*' (all interviewees). For a project to succeed, the PMI's PMBOK concedes that the main activities for each project management process group must be mapped against the nine PMKAs (Schwalbe, 2011: 83). Certainly, the perceptions indicated that

this concept was not adhered to by the project stakeholders. Hence the project succumbed to problems as a result of risks being left unattended to. According to the research framework, this requires an intensive revision of the risk assessment and analysis processes. Some of the verbatim responses (Appendix K) towards the understanding of the RM practice have been analysed in terms of literature's limitations and also summarised as follows:

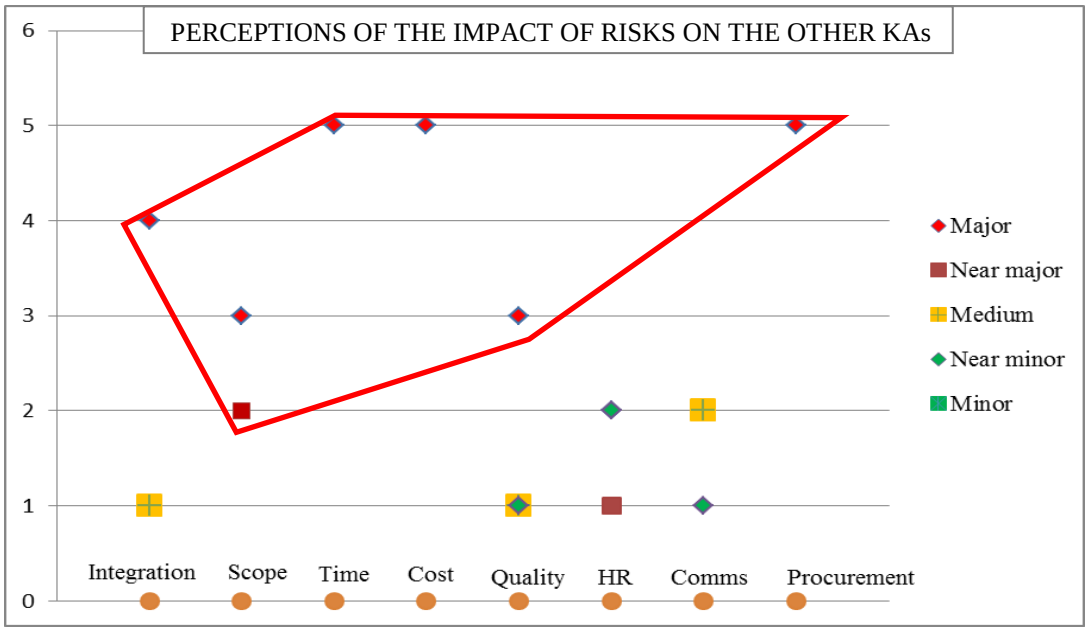


Figure 5.1: Case 1 - summarised perceptions of the impact of risks on the other KAs throughout the PLC

Source: the researcher

5.2.1.4 The status of RM practice

Table 5.2 presents the RM practice overview for this case study as analysed and concluded from the preceding information. The level of RM and the RMP with regard to the data collected from the participants indicate a very low grade. The results indicate a perceived high risk impact on the project.

Table 5.2: Summary for the status of RM practice in Case 1

Research Elements	Client (MOPWT)	Main contractor	SUMMARY
The basis of project RM	Reliable source documents • Contract terms (***very low***)	Reliable source documents • Contract terms (***very low***)	**Very low level** • Only contract terms
The RMP	Effective RMP • None (***very low***)	Effective RMP • Only risk response (***low***)	**Very low level**

RM perceptions	Likelihood and impact (***high***) ***(=very low RM)*** Level of understanding (***very low***)	Likelihood and impact (***high***) ***(=very low RM)*** Level of understanding (***very low***)	**Very low** level of perceived RM
Status of RM practice	**Very low level**	**Very low level**	**Very low level**

Source: the researcher

5.2.2 Case 2:Leshoele-Mathokoane-Bene-Setene Road Construction Project (LRCP)

5.2.2.1 The basis of Project Risk Management in Case 2

In the LRCP, the PMOs from the client (MOPWT) and the main contractor all had extensive experiences in public construction projects. Their understanding of RM relatively matches the descriptions in the cited works. Therefore, it can be concluded that they share a fair knowledge of project RM as a result of experience. Following epigrammatic translations from Chinese to English, the RM plan document from the main contractor indicated RM procedures to be followed when managing risks, which were adapted from the PMI. There were duties and responsibilities assigned to the PMO members. Further support was afforded by the contingencies allowed in the contract. However, there was neither a formalised RM plan document nor any reliable document to substantiate any planning. After the analysis of the findings and careful consideration, it can be concluded that this project reflected a low-to-medium level in terms of RM planning.

5.2.2.2 The RMP

The RMP in Case 2 is presented categorically in the following sub-headings adapted from the research framework. Each process is rated from '*Very low*' to '*Very high*' by the interviewees.

5.2.2.2.1 Risk identification

The risk identification process shows that there was an informed approach in the selection of tools from both the client's and the main contractor's teams. Clearly, the mentioned tools are analogous to the ones recommended from theoretical findings in the research framework. According to the responses, the effectiveness of these tools was being monitored through weekly progress meetings. This shows that

the teams were motivated and dedicated. Furthermore, the responses affirm that these tools were constantly tested throughout the PLC as new risks and sources were identified. However, there were neither output documents nor records to validate these claims. The extent into how and when each of the tools identified was utilised was unclear. Therefore, it can be concluded that the level of risk identification in this project was medium after balancing the merits and demerits.

5.2.2.2.2 Risk analysis / assessment

According to the responses, the risk analysis and assessment in this project shows that apart from the identified tools in the research framework, the teams were able to introduce a new tool called the rainfall formula. This probabilistic approach has been regarded as effective and reliable by two (50%) interviewees. To supplement this, the P-I assessment tool was used. It can be inferred that the level of teamwork between the parties has reinforced the achievement of major project feats. However, many authors have concurred that use of numerous tools must be demonstrated in order to attain a convincing risk assessment process. Therefore, it can be concluded that despite the effectiveness of the employed tools, there was still room for other alternative tools before conclusions could be drawn. Furthermore, records must be made available to support how these tools have been carried out. The level of risk analysis and assessment in this project indicates a fair amount of effort; hence it receives a medium rating.

5.2.2.2.3 Risk response strategies

The amount of information supplied with respect to risk response strategies in this project was fairly satisfactory. The input clearly highlights the teams' experience and knowledge in project management and contracting. The response rate reinforces a perception that the teams were quite up-to-date when responding to varied project adversities. The contract terms and conditions were revised to address project specific challenges and as one interviewee said:

> "*We are in a field whereby people have been doing it for hundred years plus… we do have the standard conditions of contract like FIDIC we have adopted, contracting is a basis for risk management.*"

Despite this assurance, the risk response outputs were absent for analysis and verification. Therefore, this process deserves only a medium level rating as there was insufficient proof to support such endeavours.

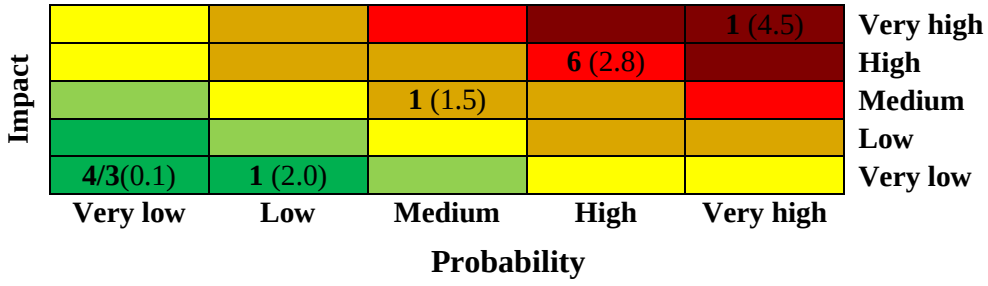
5.2.2.2.4 Risk monitoring and controlling

When summing up the responses pertaining to risk monitoring and controlling processes, the tools employed were quite consistent with the reviewed literature and the research framework. However, there were no outputs such as risks register updates available to furnish proof of the performed process. Therefore, a medium rating is appropriate once again because of insufficient proof.

5.2.2.3 RM Perceptions

In terms of the 5-point Likert scale designed to gather individual perceptions, Table 5.3 represents the rated risk P-I perceptions of four interviewees where the execution stage was rated '*High*' by two interviewees (50%), '*Very high*' by one (25%), and '*Low*' by the other (25%). However three (75%) interviewees regarded the P-I at the execution stage to be '*High*' while one rated it '*Very high*'. Two (50%) interviewees regarded the initiation stage to be experiencing '*Very low*' likelihoods of risks while another 50% disagreed claiming that this phase was experiencing '*High*' P-Is. The closeout stage was not graded as the project was still at the execution phase.

Table 5.3: Summary of risk P-I across the PLC in Case 2



Source: the researcher

Meanwhile, the project was regarded to be experiencing major time and cost related impacts by two (50%) interviewees respectively, while one (25%) interviewees believed that other respective areas were seriously affected as indicated in Figure 5.2 (extracted from Table 4.15) with response rate on the Y-axis. Therefore, the interviewees seemed to have addressed some of the functional areas: hence this project can be regarded as managed at a medium risk level according to the equal distribution of the red dots in Figure 5.2 (scatter diagram).

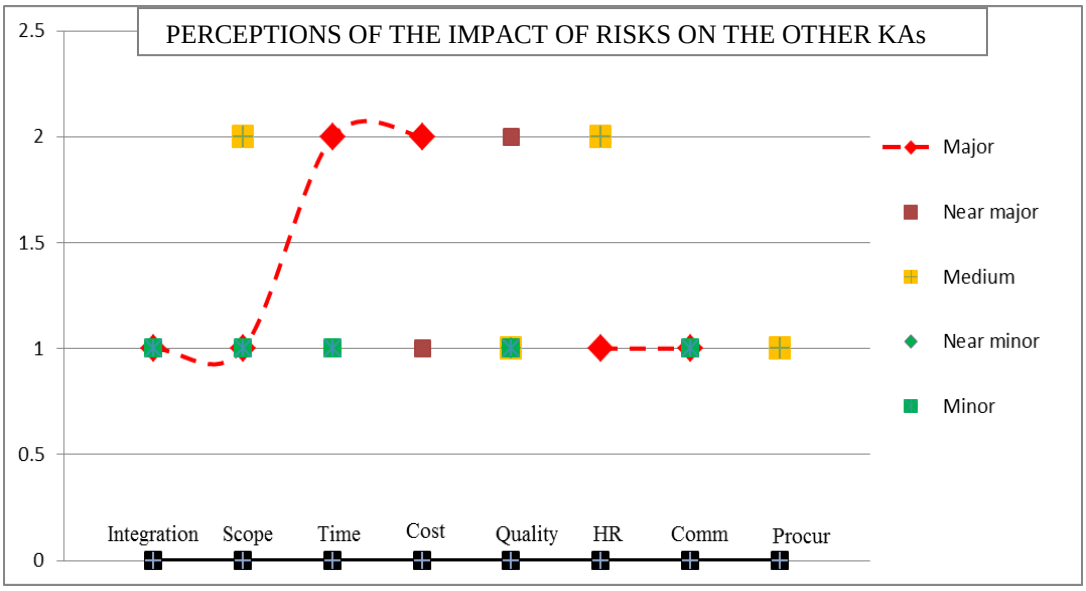


Figure 5.2: Case 2 - summarised perceptions of the impact of risks on the other KAs throughout the PLC

Source: the researcher

5.2.2.4 The status of RM practice

According to the comparative RM analysis in Table 5.2, the status of project RM in Case 2 seems to merits a medium across most facets of the research elements.

Table 5.4: Summary for the status of RM practice in Case 2

Elements of the risk management-research approach	**Client (MOPWT)**	**Main contractor**	**SUMMARY**
The basis of project RM	Reliable source documents • Contract terms (***low***)	Reliable source documents • Generic RM plan, work plan, contract terms and contingency allowances(***medium***)	**Low -Medium level** • Fair amount of RM planning
The RMP	Effective RMP (***all at medium level***)	Effective RMP (***all at medium level***)	**Medium level**
RM perceptions	Likelihood and impact (***medium***) (=***medium RM***) Level of understanding (***low***)	Likelihood and impact (***medium***) (=***medium RM***) Level of understanding (***low***)	**Medium level** of perceived RM
Status of RM practice	**Medium level**	**Medium level**	**Medium level**

Source: the researcher

5.2.3 Case 3: Nyenye–Mapoteng–Makhoroana Lot1 Road Rehabilitation Project (NMMR)

5.2.3.1 The basis of Project Risk Management in Case 3

The interviewees indicated that known tools had hitherto existed within their respective RM plans. As this project was also run through the RD, similar characteristics to those prevailing in Case 2 were evident. For example, the RM plans from the client organisation and the contractor were based chiefly on the conditions of the project specific contract which highlighted the parties' obligations and recourse conditions. However, there was no extant formal RM plan document to be perused. The effectiveness of a single-handed approach to managing project risk is not satisfactory as indicated in the literature; hence this inadequate planning deserves a no more than a low rating.

5.2.3.2 The RMP

The RMP in this project is studied in the following sub-headings. Each process is graded from '*Very low*' to '*Very high*'.

5.2.3.2.1 Risk identification

There were a fair number of tools and methods used in the risk identification process for identifying varied risk types and sources. These tools were relevant to the ones recommended in the research framework. Therefore, the project teams' abilities to address this process appear effective, hence the justifiable number of risks identified throughout the PLC. The amount of effort displayed here meets a medium level risk identification standard.

5.2.3.2.2 Risk analysis / assessment

The project teams have indicated that there were three tools for analysing and assessing risk in this project. The rainfall formula for example can be regarded as effective. Together with the backing of the risk tracking method, the teams were content with these processes. However, research has recommended a mix of varied tools and methods for a convincing medley of risk assessment processes. Therefore, this serious oversight and lack of output documents as proof render the level of risk identification to be low.

5.2.3.2.3 Risk response strategies

The project teams' responses indicate that they are familiar with the elements of this process. They claim to have chosen the strategies with care. As a result, they were able to achieve their objectives as indicated by the tactics performed. The conditions of contract have ensured exhaustive strategies which are in place for both parties. Insurance cover for example, has provided a significant basis for assuring risk coverage. Once again, there was no evidence of such activities in the form of outputs to allow assessment of this process. Therefore, without the basis for assessing the level of risk response, one can only assume that a medium grade is appropriate.

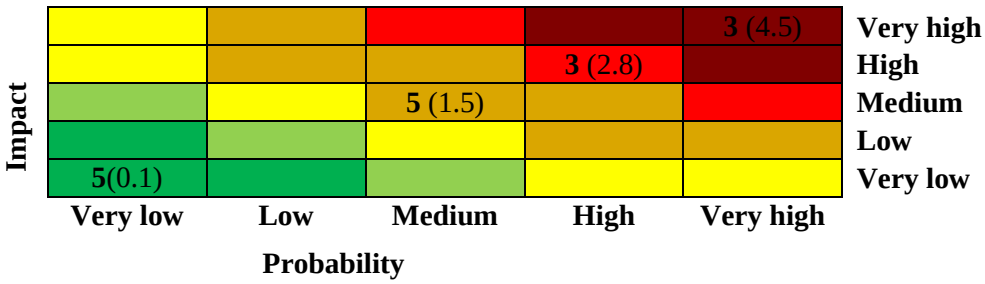
5.2.3.2.4 Risk monitoring and controlling

In this project, the risk monitoring and controlling processes have been limited to progress and weekly meetings. These methods however were clearly fragmented and there was no evidence as to how these were effectively carried out via risk register updates or records. The basis of their effectiveness is murky and unconvincing. This process therefore deserves only a very low grade.

5.2.3.3 RM Perceptions

The perceptions of interviewees are summed up in the P-I grid (see Table 5.5). The interviewees believed that the risks' P-Is would be equal. Two (50%) interviewees indicated that '*Very high*' P-I had been experienced at the execution stage, while one (25%) believed the closeout was experiencing similar problems across the PLC. Another two (50%) of the interviewees regarded the execution stage to be experiencing '*High*' P-I, where another '*High*' score was graded on the closeout stage by an interviewee. All four (100%) interviewees regarded the initiation as the least troubled stage. The planning and design stage was rated '*Medium*' by three (75%) interviewees and '*Very low*' by one (25%). Meanwhile, the execution stage was rated '*High*' by two interviewees and '*Very high*' by the other two thereby identifying it as the most troubled phase. Furthermore, 100% of interviewees rated scope as '*Medium*', while time, and cost rated '*Very high*' respectively (100% of interviewees) as indicated by the top tier skewed distributed red dots in Figure 5.3 (based on the data in Table 4.23) with response rate on the Y-axis.

Table 5.5: Summary of risk P-I across the PLC in Case 3



Source: the researcher

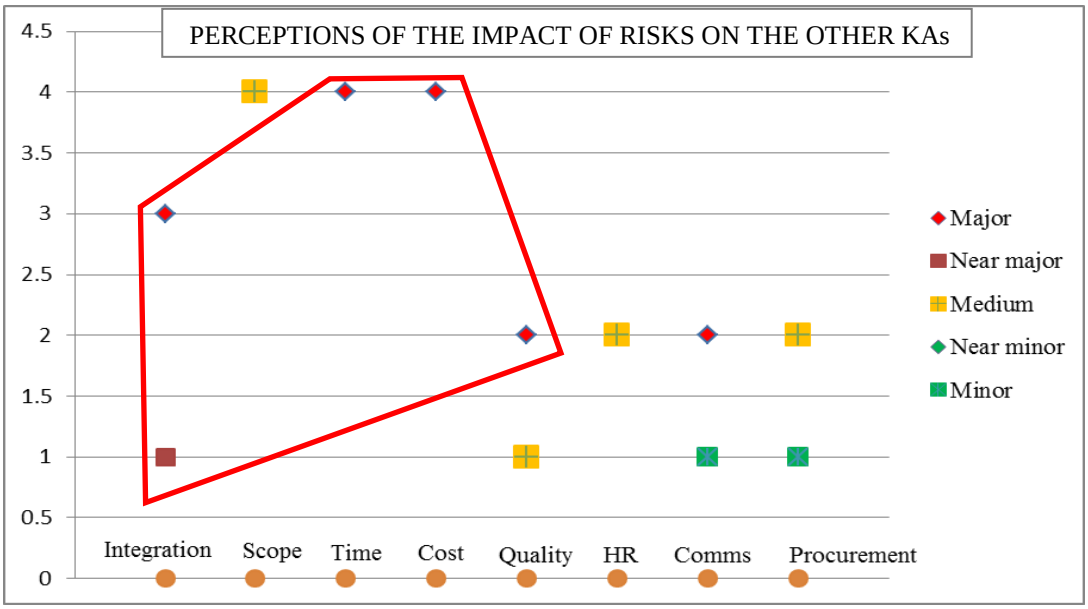


Figure 5.3: Case 3 - summarised perceptions of the impact of risks on the other KAs throughout the PLC

Source: the researcher

Despite all these, the results indicate a perceived high risk impact on the project. This is because there was a slight gap between those who perceived the high impact and those who were still optimistic about the challenges. There was also a mention of two project areas under the spotlight, i.e. time and cost. These were followed by integration. Therefore, the overall impression shows a perception of high adverse impact on the project, thereby implying inadequate RM practice.

5.2.3.4 The status of RM practice

The summary of conclusions and analysis from respective chapters is presented in Table 5.6. The summary therefore reveals that the level of RM practice in this project was low.

Table 5.6: Summary for the status of RM practice in Case 3

Elements of the risk management-research approach	**Client (MOPWT)**	**Main contractor**	**SUMMARY**
The basis of project RM	Reliable source documents (***low***)	Reliable source documents(***low***)	**Low level** • Low level of RM planning
The RMP	Effective RM processes (***low***) • Risk identification (*medium*) • Risk assessment & analysis (*low*) • Risk response (*medium*) • Risk monitoring & controlling (*very low*)	Effective RM processes (***low***) • Risk identification *(medium*) • Risk assessment & analysis *(low*) • Risk response *(medium)* • Risk monitoring & controlling *(very low)*	**Low level** on average • Low level of RM processes
RM perceptions	Likelihoods and impacts (***medium***) (= ***medium RM***) Level of understanding (***low***)	Likelihoods and impacts (***high***) (= ***low RM***) Level of understanding (***low***)	**Low – Medium level** of perceived RM
Status of RM practice	**Low level**	**Low level**	**Low level**

Source: the researcher

5.3 Cross-Case Analysis

5.3.1 The basis of Project Risk Management

The findings across all three case studies are concisely summarised in Table 5.7. According to the table, the basis of project RM in these cases is found to be at the low level. Case 1 had a poorly defined basis for managing the project risks as the project relied solely on the contract terms to address risks. This was completely insufficient towards the RMP: hence the case is awarded a very poor grade. Meanwhile, Cases 2 and 3 share similar characteristics as a result of the RD taking centre stage for both these projects. These were found to be addressing some risks. However, these similar characteristics were later found to be inadequate.

Overall, the contract terms and provisions were found to be the most common tool for the basis of RM. Contingency allowances in two RD's projects formed a RM basis to an already inadequate RMP. Therefore, the ultimate combined grade is awarded at the low level.

5.3.2 The RMP in Lesotho Public Projects

The RMP across the three cases has been successfully assessed throughout the prescribed phases. When reviewing Table 5.8, the comparative assessment shows that Case 1 has been insufficiently risk-managed across the phases. This project has been characterised by low project management impetus. From the data collection and analysis stages, the expected features of RM that are able to satisfy the framework requirements have been absent.

However, Case 2's medium score rating indicates a moderate improvement in some aspects of RM. Case 3 scored at low level because risk assessment and analysis scores were low, while risk monitoring scored very low. When averaging the responses based on the usual 5-point scale for the rated perceptions, the overall results indicated a low level score.

5.3.3 RM Perceptions in Public Projects

The analysed responses indicate that in Case 1, the participants were convinced that the level of RM was very low while in Cases 2 and 3, the P-I's perceptions on the projects were found to be medium and near medium respectively. Therefore, when all three are averaged out, the combined score is a low level of perceived RM (Table 5.8). On average, the Initiation stage earned the most '*Very low*' scores (63%) across the cases, while planning and design earned '*Medium*' (47%), and execution stages scored '*High*' (53%) and '*Very high*' (32%) as shown in Table 5.7. It is worth noting that the Closeout stage was not fully addressed due to the fact that Case 2 was not awarded any P-I score for this stage as the project was still at its execution or construction phase. However, the results from the other two projects are inclined towards a '*Medium*' score (23%). Finally, the risks' P-Is were perceived to be '*High*' and '*Very High*' at the execution stage by most interviewees. The initiation stage was regarded as immune from the risks by the majority of participants (63%).

Table 5.7: Combined interviewees' average score of P-I across the projects' PLC

Project Stage	Response (%)				
	Very Low	Low	Medium	High	Very high
Initiation	***63***	*0*	*7*	*17*	*13*
Planning & design	*32*	*0*	***47***	*8*	*13*
Execution	*0*	***15***	*0*	***53***	***32***
Closeout	*0*	*0*	*23*	*22*	*22*

Source: the researcher

5.3.4 The level of RM Practice in the three Lesotho public sector projects

Table 5.7 summarises the resultant level of RM practice across the three cases. The combined level of the RM practice on these three projects is found to be low. This conclusion is arrived at via cross-case synthesis whereby the respective cases are matched-up against the three adopted research elements. Moreover, individual cases have been analysed and gauged against each other to determine a common basis. The respective RM processes' tools and techniques were assessed relative to the adopted framework (Figure 2.3) and the analysis to present the data in Table 5.8. The comparative and net effect across Table 5.8 therefore indicates via a conclusive analysis that overall a low level of project RM practice exists in these public sector construction projects due to inadequacies identified in the analysis.

5.4 Summary

This chapter presented a successful data analysis using qualitative P-I grids and scatter diagrams. Response rates were also indicated in percentages to demonstrate how the majority of interviewees responded. This information is used in the subsequent discussions. Respective tools and techniques used under each case's RM processes are captured in Table 5.8 to present a comparative cross-case analysis across the three projects. Individual case's RM processes were qualitatively scaled using the analysed data to assess the level of RM practices.

Table 5.8: RM in the three case projects in Lesotho

RM research approach elements	**Case 1:** *TCC*	**Case 2:** *LRCP*	**Case 3:** *NMMR*	**SUMMARY**
a. The basis of project risk management	***Very low level:*** • *Only contract terms used*	***Low-Medium level:*** • *Generic project plan* • *Contract terms & provisions* • *Contingency allowances*	***Medium level:*** • *Generic project plan* • *Contract terms & provisions* • *Contingency allowances*	**Low level**
b. The RMP	***Very low level:*** • *Risk identification* • *Risk assessment* • *Risk monitoring & controlling* • *Risk response planning*	***Medium level:*** • *Risk identification* • *Risk assessment* • *Risk monitoring & controlling* • *Risk response planning*	***Low level :*** • *Risk assessment (low)* • *Risk monitoring & controlling (very low)*	**Low level**
c. RM perceptions	***Very low:*** • *Perceived level of RM*	***Medium-High level:*** • *Perceived level of RM*	***Low-Medium level:*** • *Perceived level of RM*	**Low level**
Status of RM practice	**Very low level**	**Medium level**	**Low level**	**Low level**

Source: the researcher

CHAPTER SIX

DISCUSSION OF FINDINGS

6.1 Introduction

This chapter presents the discussion of the qualitative findings relative to the problem statement, the theoretical framework, and research questions.

6.2 The problem statement

In Lesotho, stakeholders in the construction process are failing to implement risk management practices that employ contemporary methods and techniques which are necessary to assure project success.

In general, the reviewed literature offered pointers to project success in terms of RM. Appropriate approaches were mooted in terms of discovering the causes and effects of risk in varied project settings. However, the findings of this study fully vindicate the validity of the problem statement with eleven (85%) interviewees failing to fully understand and recognise RM. From the outset, it was evident that RM planning was being overlooked and that stakeholders were not prepared to tackle any project uncertainty as there were no RM methods adopted. These findings affirm the reports and findings of the African Development Bank (2011: iv) and Mpaki (2014a: 25; 2014b: 26), which indicate that the local construction industry was found to be underperforming due to series of challenges. Evidently, the impractical and ineffectual approach vis-à-vis RM planning is one of the key reasons why these challenges are not being adequately met. Clearly, human and organisational resistance is an inhibiting factor to RM implementation (Ke, Wang & Chan, 2012: 681). Most importantly, Zhang and Fan (2013: 199-200) recommend that projects must be managed by people who meet the key project performance criteria.

6.3 The basis of project RM

The results of this study reflect that only two cases out of three (67%) had a PMO which was fairly active with the third failing to fulfil the entire measure of RMP. Fewer than two (15%) interviewees in the two projects were able to define RM and the RMP to an acceptable standard. Moreover they failed to meet the standard outlined by the literature as they lacked purpose, methodology, and goals. According to Schwalbe

(2011: 428-429), the RM planning document must clearly show how the RM will be carried out. One contractor out of three (33%) was able to provide a generic document. Upon close inspection, the document was not revised to outline the procedures as illustrated in Figure 2.3 (page 17). Therefore, a clear RM plan was non-existent in all three cases as risks were merely being managed with insufficient tools and procedures. According to Nicholas and Steyn (2011: 384), the plan must specify ways of managing risks, and specify the persons accountable for such roles. The study revealed that ten (77%) interviewees were generally not aware of concepts and lacked exposure to an effective RM protocol. Twelve (92%) interviewees only regarded risk as a negative event as opposed to a realisation that risk can also have a positive effect on project objectives (Enshassi & Mosa, 2008: 96; Schwalbe, 2011: 425; RMTG, 2012: 3).

6.4 The RMP

The risk identification process in Case 1 appeared to be almost non-existent. However, findings indicated that in the other two cases (67%) attempts were made to formulate strategies for identifying risks. These included among other, brainstorming sessions, contract reviews, historical data analyses, case comparisons, and SWOT analyses. According to the framework in Figure 2.3, these tools and techniques were consistent with the best practices. Contract terms have been found to be the primary means of identifying risks across all cases. However, interestingly, researchers have found this approach inadequate for public projects as contractual related risks can complicate the process if there is not enough expertise involved (Issa, Emsley & Kirkham, 2012: 1228). According to the analysis, the stakeholders in all three projects seemed to rely on intuitive judgement and informal assumptions.

Meanwhile, the identified risks seem to evolve from initiation up to the close-out phases – and especially for those related to time, cost, scope, and quality. According to Pretorius, Steyn and Jordan (2012: 10), these areas are the '*core functions*', whereas others e.g. communications, are '*facilitating functions*' of the project. Therefore, the understanding is that the risks experienced were mostly those that cripple the core elements of the projects. The study further shows that emerging risks were experienced mostly in the construction phases of the projects as indicated by 85% of interviewees (see Table 5.7 in page 64). 54% of interviewees admitted that they were unable to cope with these compounding challenges. This scenario is consistent with

the findings of many researchers that poor performance, low quality, time and cost overruns, drawing mistakes, insufficient details, poor communication, and poor training are the major reasons for mounting project complications (Laryea, 2007: 10; Yusuwan, Adnan & Omar, 2008: 106; Mahamid, 2013: 52; Ke, Wang & Chan, 2012: 678). Furthermore, tools such as the rainfall formula and the critical path analysis (CPA) have been used interchangeably in the two roads project when assessing and analysing risks. According to 15% of interviewees, these tools have proved to be effective as the team was familiar with them. The rest of the interviewees felt that the risk assessment and analysing tools were too complex to perform with success. This type of perplexity has also been confirmed by Forbes, Smith and Horner (2007: 736).

6.5 The Perceptions regarding risks and RM on public construction projects

The verbatim responses in Appendix K have been analysed in terms of supporting and relevant literature-based framework and summarised and discussed so as to identify the levels of interviewees' understandings. The relevant data from responses to the scheduled questions (see below) were logged in the field notes.

- Based on your past experiences, how best do you think risk should be addressed?

Twelve (92%) interviewees agreed that risk is a negative aspect of a project which deserves maximum attention; hence a RM role must be dedicated to a construction project manager who should at all times formulate project specific RM plans. Eight (62%) interviewees concurred that potential risks should be allocated a certain portion of the project budget. Meanwhile, eight (62%) believed that risks that have a direct impact on cost, time, and quality should be prioritised and dealt with immediately. On the other hand, 100% of interviewees agreed that risks should be formally handled using strategies that are in line with internationally accredited practices. However, none (0%) of the interviewees mentioned the use or adoption of appropriate tools or techniques conforming to these listed in Figure 2.3 (page 17). Seven (54%) interviewees agreed that a RM policy must be adopted by the contractors. However some studies have shown that it is important to address risks across the PM knowledge areas, while resolving gaps between theory and practice (Ke, Wang & Chan, 2012: 682; Pretorius, Steyn & Jordaan, 2012: 10; Schwalbe, 2011: 433). Therefore, most interviewees' perceptions on the effectiveness of RM seemed to be mostly concentrated around institutional planning without clearly mentioning the details of

the processes as described in Figure 2.3. These findings support the Nicholas and Steyn's (2011: 363) assertion that managers in technical projects tend to avoid RM tools because they find them too complex to understand.

- How do you perceive the level of RM practice in the public projects?

Twelve (92%) interviewees believed that appropriate consideration of risks, their likelihoods, and impacts in their organisations was lacking. The focus of attention was more on achieving the projects' goals without paying sufficient attention to the inhibiting factors. All interviewees claimed that overruns are realised only at the project completion stages, while eight (62%) considered inadequacies in technical information, e.g. detailed specifications were generally overlooked at the design stage and this resulted in unnecessary variation orders. The employers had exhibited some reluctance in promoting RM culture according to eight (62%) interviewees. The tenor of these findings is consistent with the studies of Yusuwan, Adnan and Omar, (2008: 122), who claim that despite project stakeholders being exposed to risks, they still have confidence in old elusive concepts and have failed to embrace the new concepts. This scenario is affirmed by Wang *et al*. (2015: 165) who argue that quality risk decisions warrant an effective RM practice. Furthermore, variation orders cannot be avoided as they are commonly accommodated in contracts - but first their applications and limitations must be understood (Sunday, 2010: 102). Finally, it must be concluded that the stakeholders' risk awareness and perceptions vis-à-vis the level of RM practice for these projects was very low.

- What do you think must be done to promote RM practice and what will be the benefits?

The general view by eleven (85%) interviewees is that the ministry (MOPWT) should strive to attract keen project risk managers into the PMO. All interviewees believed that operational RM policies and procedures must be implemented in order to manage risk effectively at the construction sites. Although the interviewees have recommended that the practice must be entrenched at all levels, researchers have found out that limiting factors with regard to RM implementation include the following; lack of personal RM knowledge and training, insufficient information, inadequate industry tools and techniques, together with human or organisational resistance (Ke, Wang & Chan, 2012: 678-681). Therefore, these factors warrant more attention in order to

attain the desired goals. Above all, stakeholders need a higher level of RM understanding to avoid any laxity in the promotion thereof. While interviewees revealed a heavy reliance on contract terms, researchers such as Tran and Molenaar (2014: 633-634) point out that a suitable risk allocation mechanism for project delivery requires fair risks' responsibilities distribution involving all the contracting parties. Therefore in a good RM practice, they encouraged the use of Build-Operate-Transfer (BOT) and the Build-Own-Operate-Transfer (BOOT) models to curb technical, operational, constructions, financial, and revenue related risks in public projects.

- Any recommendations regarding RM practice in public projects?

According to the recommendations made by eight (62%) interviewees, the appointment of qualified construction project managers is crucial. They also concurred that an appropriate and centralised PMO must be established to oversee the public projects. More than seven (54%) interviewees agreed that continuing training and development for construction and project managers is essential so that risks are dealt with from the operational up to the top level. This assertion is consistent with the views put in the reviewed literature. Risk response strategies as reflected by some interviewees need to include public and private engagements, including public-private partnering and public finance initiatives (PPP/PFI) for public infrastructural development (Ngoma, Mundia & Kaliba, 2014: 16).

6.6 The research questions

Following the details of cross-case analysis as illustrated in Table 6.1, each research question received the following responses:

- *How is RM perceived in a public sector construction project in Lesotho?*

According to the summary of the analysed data, the participants have differing perceptions regarding RM. In Case 1, four (80%) interviewees were adamant that the level of RM was very low on this building construction project. These findings are consistent with the statements by Schwalbe (2011: 422) that RM is a commonly overlooked element in PM. Since the two civil engineering road projects had almost similar performance characteristics, the perceptions were relatively optimistic towards PM yet the methods were not sufficiently within the framework's strictures. Similarly,

according to Nicholas and Steyn (2011: 363) project managers tend to avoid giving attention to the likelihood of risks because they find it too complex to deal with. Therefore, RM practice has been perceived to be low as purported by assumption 3.

- *How is construction RM practiced in a public sector project in Lesotho?*

Relative to the practice of RM, the findings have shown that the elements of the RMP were not adequately addressed in the building construction project (Case 1). The team (100%) admitted that they lacked fundamental RM and PM skills as indicated in the analysis. The CMAA (2011: 15) advises that requests for qualifications (RFQ) should be advertised so that eligible and qualified construction and project managers - as private individuals or as consultants - are hired on a qualification selection basis. Clearly, the prescribed RM standards were not followed and the teams were not familiar with the PMBOK or RMBOK frameworks. However, in terms of the road projects, there seemed to be an awareness and appreciation of the RMP, albeit insufficient methods. As pointed out by Schieg (2007: 145) and Shang *et al*. (2005: 392) risk analysis and assessment as the most important RMP elements tend not to be well practiced as risks remain rampant. Therefore, this research question is supported by assumption 3 stating that *RM practice has a major influence on project success.*

- *How do construction risks change during a project life cycle in the public sector in Lesotho?*

The findings show that risks evolve from being seemingly insignificant to having considerable likelihoods and impacts. Few risks were identified at the initiation stage, but tended to amplify afterwards (see Table 5.7). These risks have been identified as immense and destructive at the construction stage. However, the effects of these risks seem to diminish towards the project closeout. Across the cases, most of the major risks were environmental, financial, technical, and political in nature. This phenomenon is supported by the first, the second, and the fourth research assumptions (see Table 6.2).

- *How should construction RMP be used in public sector projects in Lesotho?*

The responses to this question lead to the attainment of the associated objective, i.e. *the determination of how construction RMP should be used on public sector projects in Lesotho*. The findings indicate that the RMP needs to be tailor-made for a project so that the tools and methods are relevant to the project. About nine (69%) interviewees

believed that risk identification process tools were assumed to be casual but also believed there are formal approaches that need to be introduced. Seven (54%) interviewees believed the risk analysis and assessment seemed to be too technical; this indicates that continuous training is required through private sector engagement. Eight (62%) interviewees indicated that a RM plan should provide the basis on how best to respond to the risks identified. They also advocated the use of insurance cover and contingency plans as compulsory requirements. Regarding risk monitoring and controlling, about eight (62%) interviewees recommended the use of periodic risk audits undertaken by independent private consultants. Nine (69%) interviewees recommended that the public sector should consider capacity-building and training for the MOPWT staff in order to address the RM technicalities. They also recommended that a standardised portion of project funds be allocated for RM.

6.7 Concluding remarks

The research findings and reviewed literature showed that the research questions have been fully supported by the assumptions (Table 6.2). The study showed that the level of RM practice on public projects does not adequately satisfy acceptable practices (see Table 6.1) and that many interviewees had displayed RM inadequacies. To a large extent, mere intuitive methods had been adopted when projects were failing. Understaffing, inadequate support, and lack of requisite PM skills were cited as major problems.

Table 6.1: Summary of findings

Research element	**Case 1**	**Case 2**	**Case 3**	**Summary**
RM basis	*Very low*	*Medium*	*Medium*	*Medium level*
The RMP	*Very low*	*Medium*	*Low*	*Low level*
RM perceptions	*Very low*	*High*	*Low*	*Low level*
RM practice Level	***Very low***	***Medium***	***Low***	***Low level***

Source: the researcher

Table 6.2: Level of correlation of assumptions with the findings

Research questions in numerical representation	**Corresponding assumptions in numerical representation**	**Summary**
RQ 1	*A3*	***Correlated***
RQ 2	*A3*	***Correlated***
RQ 3	*A1, A2, & A4*	***Correlated***
RQ4	*A3*	***Correlated***
Level of correlation	***Consistent correlation***	

Source: the researcher

CHAPTER SEVEN

CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

This chapter concludes the study by presenting the extent of RM practices in Lesotho public sector construction projects. The conclusions highlight RM perceptions, the levels of the RM practices, the risks dynamics during the PLC, and the recommendations with respect to how best the RMP can be used in the public sector.

7.2 The research outline

The following sets of objectives for this study have been achieved as follows:

- The perceptions and application of risks on public sector construction projects in Lesotho.

  This objective has been achieved through the framework adopted with the help of case study interviews and field notes. The discussions have provided a breakdown on interviewees' views regarding the elements of RM practice. Overall these perceptions were found to be inadequate.
- The practice of construction RM in public sector projects in Lesotho.

  Lopsided RM practices and approaches have been revealed by this study. The adverse effects of single-handed PM customs on project performances - due mainly to lack of RM consideration - have been effectively disclosed.
- How construction risks change during a project life cycle (PLC) in the public sector in Lesotho.

  The dynamics of risks in a PLC have been uncovered relative to their probabilities and impacts. The interviewees' perceptions regarding this have provided a record of their experiences which provides some disturbing insights into the impacts of risks on projects - due mainly to unanticipated changes in risk forms.
- How should construction RMP be used in public sector projects in Lesotho? *The framework, data analysis, and recommendations have provided explanations on how best the problems resulting from inadequate RMP can be pragmatically alleviated. The interviewees have recommended varied approaches, which can be adopted, while the theoretical framework also offers a variety of supplementary tried and tested solutions.*

7.3 Conclusions

This research has revealed irregular RM practices in the public sector construction projects that have been investigated in the three case studies. The findings in Chapter 5 show that lack of experience of the project teams had a significant bearing on the performance of the PMO. Hence the majority of the project teams were unable to address the rampant risks which were common across the projects because they lacked knowledge of available formal RM tools and techniques. Significantly, the literature attests to the crucial importance of selecting suitably qualified construction and project managers for public works projects.

The majority of interviewees admitted that they lack the requisite PM skills such as teamwork as reflected in Chapter 5 and Section 6.5. This was evident when the design information was overlooked from the design stage. Consequently, it has been discovered that risks amplified in terms of probability and impact at the construction stage while the risk analysis and assessment processes tended to be poorly executed, and also perceived as being too complex by the stakeholders.

Apparently, there were no standard approaches in place towards identifying, responding to, monitoring, and controlling risks. Informal brainstorming sessions, rainfall formulae, irregular weekly reports, contract terms, and intuitive risk quantification have been identified as the common methods practiced by the interviewees despite their ineffectiveness. Rampant yet commonly identified risks were environmental, financial, technical, and politically related. These circumstances are consistent with studies conducted in the developing countries especially those in the sub-Saharan African region where construction projects are failing due to lack of effective RM.

Meanwhile, the road project teams seem to be more aware of the need for RM and strived to address risks, albeit lacking sufficient appropriate tools and training as indicated in Chapter 4 and 5. Some interviewees indicated insufficient government support and inadequate private sector engagement. However, the interviewees have insisted on the establishment of a public projects' regulatory framework and more private sector involvement to help alleviate the manifest problems.

7.4 Recommendations

The following recommendations are offered as a means of alleviating risk-related problems and scaling up the RM practice in public projects:

- Adequate training of construction and project managers through accredited institutions or continuing professional development (CPD) is the most immediate means of correcting these adverse trends and improving the practice of RM. Regular RM workshops using experienced programme planners are highly encouraged to address the issues highlighted in Chapter 5 and Section 6.5 in particular;
- Stakeholders' collaboration and information-sharing need to be specifically planned and monitored throughout the PLC. These steps require professional audits and support from accredited PM consultants as supported by the literature;
- The GoL should regularly monitor and evaluate the public projects through consultants' risk audits in order to attain quality public infrastructure and value for money;
- A project RMP model and standard should be developed and be regularised in order to minimise financial losses through integration with the government financial management information system (IFMIS). The RMP should be applied concurrently with other production concepts, e.g. just in time (JIT), lean construction, and health and safety management;
- Contracts should be revised with project specific clauses to fully accommodate RM strategies, e.g. escalation, inflation, and extension clauses;
- The RM plans should among others, entail sound contingency plans and standby financing. Moreover, immediate risk response strategies must be considered at all times;
- To understand risks, project managers must start by prioritising risks using basic P-I models while planned work break-down structures (WBS) can be used when scheduling supervision and auditing sessions. Otherwise common schedule risk analysis models can be used, and
- Adoption of a public-private partnership (PPP/PFI) procurement alternative as a means of risks' distribution through competitive outsourcing is recommended. A PPP (often referred to as a P3) service contract between a government and a

private sector concessionaire will enable the MOPWT to pay the concessionaire to deliver a more satisfactory public infrastructure. In such arrangements, the concessionaire is contracted to account for the costs and upkeep of the facility. Similarly, the GoL may adopt the Built-Operate-Transfer (BOT) or Build-Own-Operate-Transfer (BOOT) project delivery models to curb the likelihood of numerous risks. Other benefits may include improved standards of work, value for money, synergy, and accountability.

7.5 Generalisation of results

The study has helped to uncover problems encountered by the interviewees; as a result the discussions in the previous chapter have helped in presenting these challenges in line with the research questions and the reviewed literature. The desired sample size has been satisfactorily addressed even though the projects were insufficiently manned by professionals who did not meet the necessary professional criteria especially subcontractors who were excluded due to this. The two cases were road projects, while the other one was a building construction project. The distinct features of the projects' mix provided unique insights as a result of differences in geographical locations, and scope. The RMP was tested against the elements of the research framework, the reviewed literature and the research hypotheses (assumptions). Furthermore, the conclusions were drawn relative to these achievements.

7.6 Contributions

7.6.1 Theoretical Contribution

This research provided a pragmatic study investigating the extent to which the local public projects are adjusting against the adversities they experience regularly. Therefore, those who are aspiring to improve the level of RM in public projects will find this information useful. The areas that are probably most in need of attention have been succinctly presented for individuals and practicing firms to peruse. Indeed, RM should be viewed as an essential area that must seep into other PMKAs and the PM practice. It is crucial to understand the RMP so that public projects can be continually evaluated and new frameworks proposed as these still leave room for improvements in the practice of RM. Meanwhile, the concept 'risk' needs to be understood and studied through sound theoretical frameworks by all those, including aspiring researchers, who

have an interest in and an involvement with construction projects. Moreover, this dissertation has relevance to the following topics in journals:

- Perceived likelihoods and impacts of risks on Lesotho public construction projects, and
- An assessment of the RMP in Lesotho public construction projects.

Furthermore, the adopted RMP is outlined so that it can be perused and assessed for future references and research. Since there has never been a local specific RM research publication, this study will therefore serve as a basis for understanding how Lesotho's public projects are performing compared to those in other countries. Ultimately the readers will be able to append the concepts and findings to the RM body of knowledge (RMBOK).

7.6.2 Pragmatic Contribution

The adapted research framework can be reduced to a working RM model. Therefore, in order to elevate the level of RM practice from its current low status requires greater tenacity from individuals and firms. The identified problems by different interviewees have undoubtedly highlighted real problems chiefly emanating from inadequate RM practices and RM competencies (RMCs). Meanwhile, the research findings would spark improved risk awareness and introspection essential for promoting a proper RM culture. The need for training project and construction managers to meet the required RM standards is one of the critical areas this research seeks to influence. Ultimately, it is vital that a need for a standardised RMP be acknowledged by the stakeholders within the local built environment.

7.7 Limitations

During the data collection process, the second case (LRCP) was far from completion, hence there were data limitations as the close-out phase could not be investigated. Furthermore, some project stakeholders were not willing to participate unless there were additional letters from the authorities such as the one in Appendix I. Moreover, there were also some participants who did not want to be recorded when being interviewed while subcontractors did not meet the sample requirements.

7.8 Future research

According to the results, the low level of RM practice requires a more comprehensive review, while some risks demand maximum attention from the MOPWT. Therefore, solutions such as proposing an effective RM framework specific for Lesotho public construction projects is still an outstanding area for research. Other areas for future research endeavours include, but are not limited to - the following:

- RM and value creation in public construction projects;
- Evaluation of RM effectiveness in donor financed public projects, and
- A risk management (RM) model for a competitive public infrastructure delivery.

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APPENDIX A: INTERVIEW COVER LETTER

2015/08/04

To Whom It May Concern,

Dear Sir / Madam

RE: RISK MANAGEMENT PRACTICES IN PUBLIC SECTOR CONSTRUCTION PROJECTS: CASE STUDIES IN LESOTHO

An interview is a significant part of an on-going research project at the Nelson Mandela Metropolitan University, which is aimed at meeting the requirements for MSc (Construction Management) qualification. The research, which is supervised by Prof FA Emuze and Prof JJ Smallwood, is aimed at evolving a pragmatic approach for the practice of risk management for construction projects in Lesotho.

I would like to invite you to participate in this study. Your consent is required for an interview session with your esteemed organisation, either in your offices or on your project sites. The interview is expected to take not more than one hour. Please note that the interview proceedings will be treated as strictly confidential, and a confidentiality agreement will be entered with you or your organisation should you wish so.

Thank you very much for your assistance.

Sincerely,

Mr Molefi Nketekete

Researcher

Prof Fidelis Emuze, PhD

Supervisor

APPENDIX B: INFORMED CONSENT

Introduction:

The following constitutes the informed consent prior to conducting the interviews.

Dear Interviewee

RE: RISK MANAGEMENT PRACTICES IN PUBLIC SECTOR CONSTRUCTION PROJECTS: CASE STUDIES IN LESOTHO

I want to thank you for taking time to meet with me today. My name is **Molefi Nketekete** and I would like to talk to you about your experiences participating in this construction project. This is in line with my Masters in Construction Management research as indicated in the aforesaid title. The aim of this study is to investigate the risk management practices in the Lesotho public sector construction projects throughout the project lifecycle.

The interview should take less than an hour. I will be taping the session because I don't want to miss any of your comments. Although I will be taking some notes during the session, I cannot possibly write fast enough to record it all. Because we are on tape, please be sure to speak up so that we do not miss your comments.

All responses will be kept confidential. This means that your interview responses will only be used for academic purposes and I will ensure that any information I include in this study does not identify you as the interviewee. Remember, you do not have to talk about anything you don't want to and you may end the interview at any time.

Are there any questions about what I have just explained? Are you willing to participate in this interview?

Please record your details below to facilitate my contacting you, in the event that a query should arise. **Please note that the data provided in this interview will be treated in the strictest confidence and your anonymity is assured**. **Should any query arise, you can contact me at +266 59950016.**

_____ (_____) _____ ____/____/2015

Interviewee (Names) (Phone) Date

_____, _____, _____

Address

APPENDIX C: INTERVIEW SCHEDULE

Introduction:

The following information is required to introduce the interviewee. This is followed by the structured interview questions. However open-ended questions will be asked.

Please indicate your position relative to the project **(highlight or mark with 'x')**:

RD;		BDS;		Main Contractor;		Subcontractor;		Consultant;	
PM		*Asst. PM*		*Contract. Man*		*Architect*		*Asst. Arch.*	
Engineer		*Asst. Eng.*		*CM*		*QS.*		*Asst. QS.*	

General Project Information: (*IF PM/ QS/ Principal Agent*)

Start Date;		Tender amount;	R
Anticipated finish Date;		Anticipated final cost;	R

How long have you been in this project?
How much experience do you have in public projects?

RISK MANAGEMENT BASIS:

1) Is there a project management office?
    a. If yes, who is involved?
    b. What is their involvement with regard to risk management?
2) How can you define risk management and its process?
3) Do you have a risk management plan?
    a. If yes, may I review it? (e.g. *for purpose, team, methodology, risk tolerance, budget, responsibilities, and meeting schedules*)
4) Are there procedures to manage risk? (If so, the following shall apply)

RISK MANAGEMENT PROCESSES (RMP):

5) How do you identify risks?
    a. Which tools / methods are you using and how?
    b. How often do you identify risks?
    c. Are there planned risk identification stages? If yes,
        i. At each PLC stage, what types/ sources of risks do you encounter/ identify?
        ii. Are the plans reviewed and action taken?
6) How do you assess / analyse risks?
    a. Which tools / methods are you using and how?
    b. Are these methods formal?
        i. If yes, how effective are they?
        ii. If not, how reliable are they?
7) How do you deal with the identified risks? (Q5. c.i.)
    a. Is there a risk response plan?
        i. If yes, are there formal risk response strategies and how are they performed at each stage?
        ii. If not, which strategies do you use at each stage and why?
    b. What kind of support do you get and from whom?
8) How do you control and monitor the identified risks?

RISK MANAGEMENT PERCEPTIONS:

9) At each PLC stage,
    a. How likely is it for these risks to occur and
    b. What is their impact? – Scale your perceptions by using a 5-point Likert scale from 1 **(very low)** to 5 **(very high**).
10) At each project phase, what Impact do the risks (identified) have on the eight knowledge areas? – Scale your perceptions by using a 5-point Likert scale from 1 **(very** low) to 5 **(very high)**.
11) Based on your past experiences, how best do you think risk should be addressed?
12) How do you perceive the level of risk management practice in the public projects?
13) What do you think must be done to promote risk management practices and what will be the benefits?
14) Any recommendations regarding risk management practice in public projects?

APPENDIX D: QUESTIONNAIRE

On a scale of 1 **(low / minor)** to 5 **(high / major)**, rate the following factors in terms of how you believe each relates to the question (please note the '**Unsure**' option; highlight or mark with '**x**'):

For **Question 8**(a): *At each PLC stage, how likely is it that these risks can occur?*

Project Phases	**Unsure**	**Low.....High**				
		1	**2**	**3**	**4**	**5**
Initiation **(I)**	U	*1*	*2*	*3*	*4*	*5*
Planning & design **(P)**	U	*1*	*2*	*3*	*4*	*5*
Execution **(E)**	U	*1*	*2*	*3*	*4*	*5*
Closeout **(C)**	U	*1*	*2*	*3*	*4*	*5*

For **Question 8**(b): *At each stage of PLC, what are the impacts of the risks?*

Project Phases	**Unsure**	**Low.....High**				
		1/(0.1)	**2/(0.3)**	**3/(0.5)**	**4/(0.7)**	**5/(0.9)**
Initiation **(I)**	U	*1*	*2*	*3*	*4*	*5*
Planning & design **(P)**	U	*1*	*2*	*3*	*4*	*5*
Execution **(E)**	U	*1*	*2*	*3*	*4*	*5*
Closeout **(C)**	U	*1*	*2*	*3*	*4*	*5*

For **Question 9**: *At each project phase, what Impact do the risks (identified) have on the eight knowledge areas?*

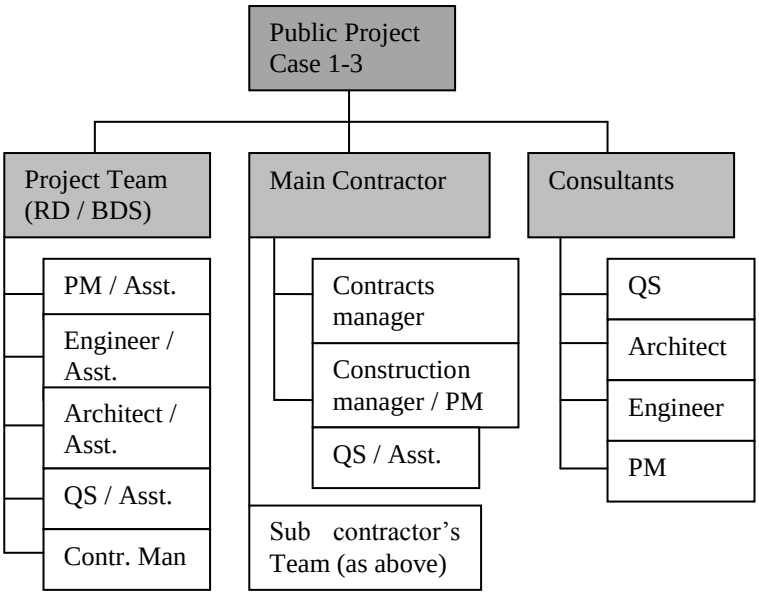
Knowledge areas	**Unsure**	**Minor.....Major**				
		1/(0.1)	**2/(0.3)**	**3/(0.5)**	**4/(0.7)**	**5/(0.9)**
Integration	U	*1*	*2*	*3*	*4*	*5*
Scope	U	*1*	*2*	*3*	*4*	*5*
Time	U	*1*	*2*	*3*	*4*	*5*
Cost	U	*1*	*2*	*3*	*4*	*5*
Quality	U	*1*	*2*	*3*	*4*	*5*
HR	U	*1*	*2*	*3*	*4*	*5*
Communications	U	*1*	*2*	*3*	*4*	*5*
Procurement	U	*1*	*2*	*3*	*4*	*5*

APPENDIX E: CASE SELECTION

Introduction:

The following case selection criteria were used.

Criteria:	Yes	No
1) The Public Projects Identification:		
a) Does the project's envisaged budget exceed M100m?		
b) Is the project run through (regulated by) the MOPWT[1] procurement standards or accredited international standards?		
c) Is the project within the building construction, civil engineering or housing sector?		
d) Has the project been recently started or is it nearing completion?		
2) Contracting Firms:		
a) Are the contracting firms listed in the case registered under A, B (MOPWT) or equivalent Grade categories?		
b) Are there project managers employed?		
3) Project Stakeholders:		
a) Do the design team/ consultants constitute the PM team?		

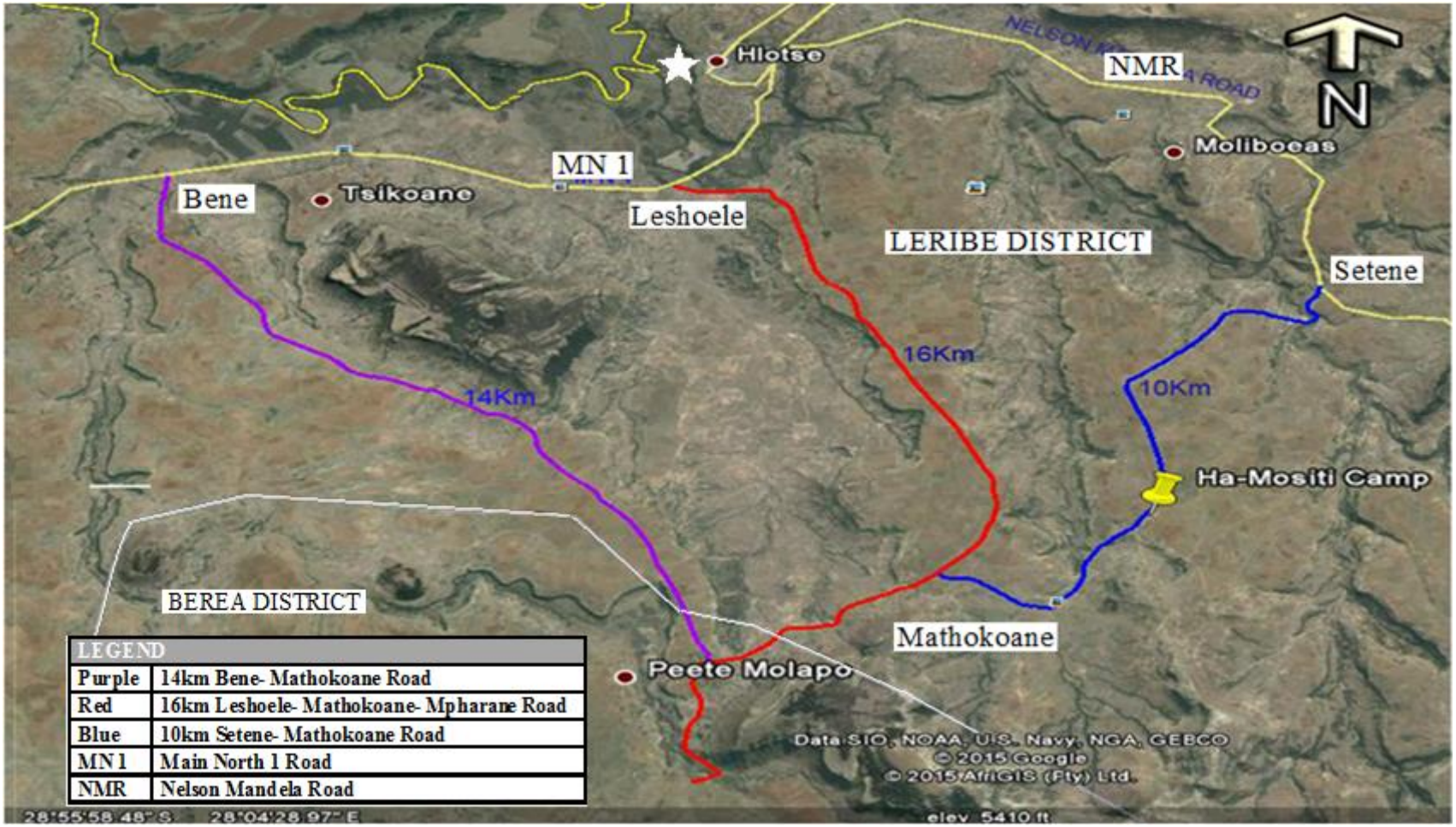


[1] Ministry of Public Works and Transport

APPENDIX F: CASE 1 AERIAL VIEW

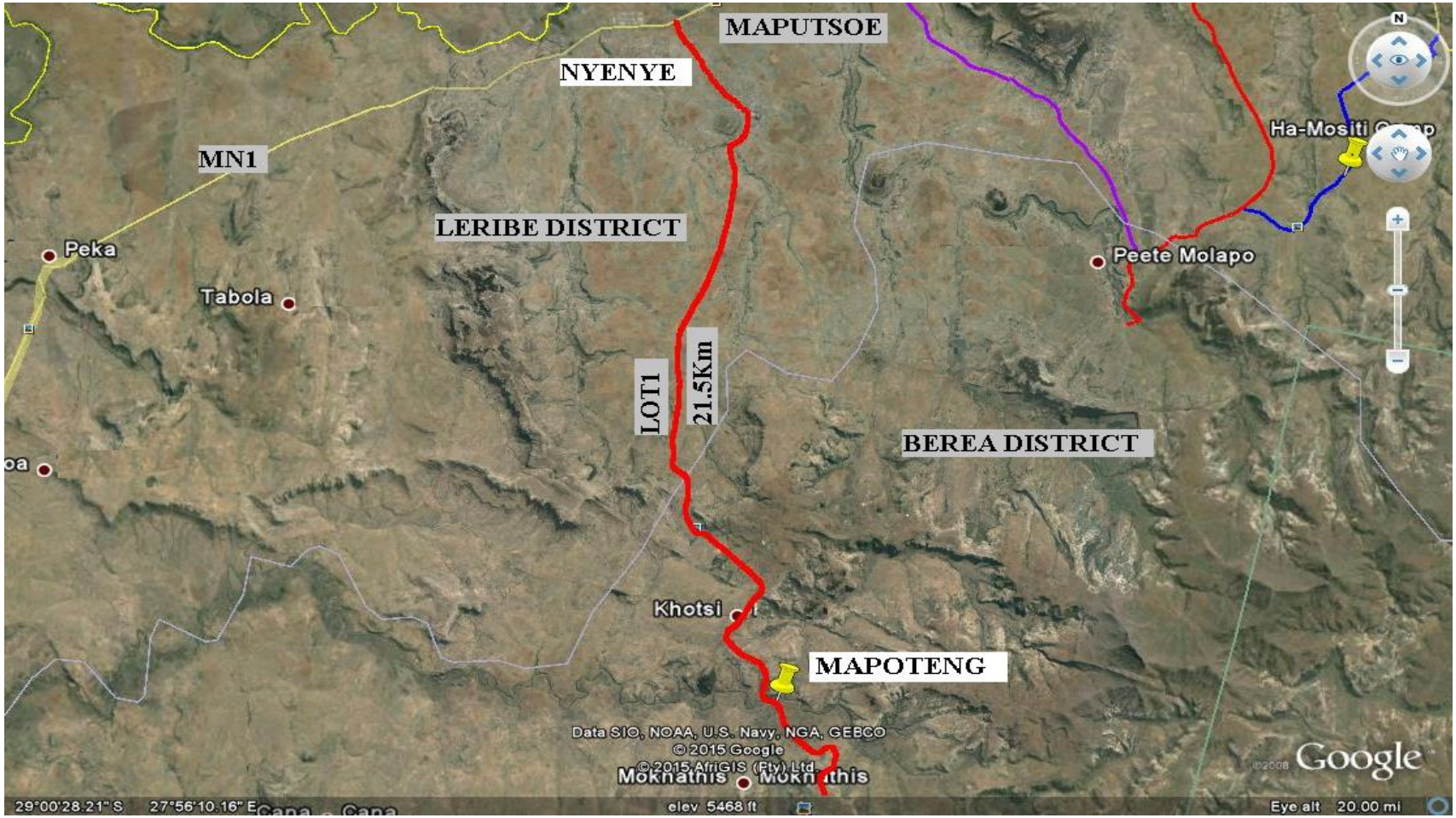
Source: the researcher and Google Earth

APPENDIX G: CASE 2 PROJECT FOOTPRINT



Source: main contractor, the researcher and Google Earth

APPENDIX H: CASE 3 FOOTPRINT



Source: main contractor, the researcher and Google Earth

APPENDIX I: LETTER FROM THE DA OFFICE LERIBE

District Administration Office
P.O. Box 1
LERIBE
22400451/293

DALC/WRK/RDS/1 16/09/2015

To Whom It May Concern

Dear Sir/Madam,

SUBJECT: RISK MANAGEMENT PRACTICES IN PUBLIC SECTOR CONSTRUCTION

The Office of District Administration, Leribe requests your company to assist Mr Molefi Nketekete- Researcher, student of Nelson Mandela Metropolitan University who is persuing MSc Construction Management. He is doing a research project on Risk Management Practices in Public Sector Construction project in Lesotho.

Please assist him accordingly wih an interview session.

Yours sincerely,

DISTRICT ADMINISTRATOR
MUSI OA SETEREKE-LERIBE
2015 -09- 16
P.O. BOX 1 LERIBE 300
TEL.: 22400451/FAX: 22400710

M. MORAHANYE (MR)

DISTRICT ADMINISTATOR – LERIBE

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• Port Elizabeth • 6031 • South Africa • www.nmmu.ac.za

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APPENDIX J: RESEARCH APPROVAL LETTER

**FACULTY OF ENGINEERING,
THE BUILT ENVIRONMENT AND
INFORMATION TECHNOLOGY**
Tel. +27 (0)41 504 3446
Fax: +27 (0)41 504 9871
E-mail: Hildegarde.Boshoff@nmmu.ac.za

13 November 2015

Student no: 207012009

Mr M Nketekete
P.O. Box 1160
FICKSBURG
9730

s207012009@nmmu.ac.za

Dear Mr. M Nketekete

APPROVAL OF RESEARCH/PROJECT PROPOSALS

The following approval of research/project proposals was approved at a meeting of the Faculty PGS Committee on 15 October 2015:

Student Name:	Nketekete, M
Student Number:	207012009
Qualification:	Master of Science in Construction Management
Title	**RISK MANAGEMENT PRACTICES IN PUBLIC SECTOR CONSTRUCTION PROJECTS: CASE STUDIES IN LESOTHO**
Supervisor:	Prof F Emuze
Co-supervisor:	Prof JJ Smallwood

Please note that you are required to register annually until your studies have been completed and the degree has been conferred.

I wish you every success with your studies.

Yours faithfully

H Boshoff (Ms)
Faculty Administration

APPENDIX K: FIELD WORK DATA

This section presents the transcription from recorded interviews conducted at the participants' offices. In Case 1, four (4) interview sessions were recorded at the BDS offices while in Cases 2 and 3 only one recording from the RD was captured. The data logged in the researcher's field notes are presented in the following section as the other participants did not want the interview sessions to be recorded. The exact words as spoken by the participants are interpreted and represented under strict transcribing guidelines. Peoples' names have not been used to protect the interviewees' confidentiality; hence the conversations were coded with **P**s. Furthermore, examples made were excluded to safeguard the interviewee's viewpoint. All the sessions were limited to 60 minutes and proceeded as per the structured interview schedule to make sure that the important information is covered. To strengthen this quest, non-structured questions were asked to allow the participants to provide more information.

<u>Part 1</u>: Transcription of Recorded Interviews.

Case 1:

Interviewee One (Code P1)

(*Audio Ref.: 20150813094206*)

This interview was held in the Participant's office at 09:42, August 13, 2015. The interviewee (P1) was relaxed and very convivial. He used Sesotho more often when expressing himself. He made numerous examples based on his work experiences which are excluded in this presentation for confidentiality reasons. The session got off smoothly as anticipated.

Researcher **(R)**: First let's start with first interview question… as an engineer… regarding the project… is it called Tsifa-li-mali local court construction project?

Participant 1 **(P1)**: *hmm, Tsifa-li-mali local court construction project,*

R: and can you just briefly describe how much experience do you have in public projects… roughly?

P1: *I believe…I am not sure… [Translated] experience….it depends if that is negative or positive…within public projects… really our projects are not well administered, resources are lacking… I believe… regardless whether the project is locally or internationally funded… things are not basically done well especially the issue of*

supply and demand… so, the optimum requirements are not met. Progress reports are inadequately monitored… reporting is very poor.

R: How can you explain risk management, especially to someone who doesn't know?

P1: *I think risk management entails disasters that can happen to a structure or that can hamper the project success… it can be in any forms… it can be about endangering peoples' lives or allocated resources becomes inadequate to complete the project… resources are not readily available…*

R: What is the process for managing risks?

P1: *To manage risks is about team work, proper documentations, proper executions… I believe also we must adhere to quality management standards.*

R: Do you have a risk management plan as a client's team?

P1: *[laughing] we don't have that. However, there seems to be a risk management plan from the contractor… but I am sure there should be a correct template that needs to be followed… our contractors do have the project managers but… the standards seem to be low [laughing]… incorrect practices… they really seem to miss the procedures… there are no templates…*

R: Generally, how do you deal with risks…inclement weather?

P1: *Say it's inclement weather… rainfall...it depends on the nature of the rainfall… a contractor can still proceed with the work…*

R: Is there a way for mitigating risks…planned remedies…what are the documented procedures to follow?

P1: *Say the project was supposed to take five months – for example there was a strike that causes delays… well there must be valid reasons to consider… we normally assess and look into any irregularity… we check whether the contractor has been directly affected or not..[his phone rang and we paused]… we normally rely on the progress report which is done fortnightly to highlight any issue… therefore this must be justifiable based on work done and shall be considered for any extension of time.*

R: Basically, do you manage by contract clause?

P1: *Yes*

R: So if I want to understand this, will I be right to say you manage by contract?

P1: *Even though there are loop holes.*

R: So these risks, how do you identify them as a client team… principal agent?

P1: *Ermm… I cannot say per se how we identify risks, but we normally identify risks during risks by determining the probable risks by predicting… there are so many uncertainties.*

R: So you brainstorm each other?

P1: *Yes periodically.*

R: So you only identify them at the planning stage only and how often are the periodic meetings held?

P1: *We do continue identifying them through technical, progress and urgent meetings which are normally… progress meetings are held fortnightly whereas technically… we insist that they are held after site visits… however they are not effective. Well the meetings are there but nothing is carried out formally [laughing]… no one cares to implement… even though they are… must happen… as they are meant to avoid urgent meetings…meetings don't have agendas… [laughing]… there are no minutes… people are not interested… [laughing].*

R: Meaning, now… at each named stage [referring to the Likert scales in the mini questionnaire]… are there identifiable risks?

P1: *At project initiation… we must sit with the client… so our public clients don't really know exactly what they want… they just tell you what they want without a clear scope… there are so many problems attached to these as prices normally escalate as a public client tends to bypass the process…they specify and instruct contractors any time without our knowledge… prices escalate at the escalation price… imposed irregularities are rife… there is so much meddling…*

R: Basically, are there technical issues… especially in the awarding of contracts to incapable contractors…?

P1: *Yes… there are so many questionable aspects… especially in the level of understanding and execution… evidently, the level of related skills is very worrying… [laughing]… serious institutional problems. The execution stage is very prone to many problems…*

R: Coming to the closing stage, what are the problems encountered here?

P1: *At the commission stage… things are just done to cover up the mistakes that have happened… [laughing]… proper methodologies are not followed at all… issues of safety and cost effectiveness are neglected… that's why there are so many white elephants…*

R: Now, according to the PMI, there are nine knowledge areas including RM. At each project phase what impact do the identified risks have on the other knowledge areas…? [Referring to the Likert scale of 1 to 5]

P1*: Well, with regard to human resources, its about having the right people at the right place. Therefore, the human resources department is accountable for the results of the technical teams… therefore human related risks have a major impact because there is no transparency in the recruitment process and consultants should at least come to the rescue… [the interviewee affirmed that a maximum of 5 shall be awarded across the other areas because he believed that the department is inadequately capacitated and lacked institutional support]*.

R: Now, do you have a risk response plan in place?

P1: *No, I never heard of that here, we just respond to problems as they happen without any distinct approach… there are probability indices that I heard of… but these tools are not applied or exploited… [laughing] if you ask me about such we will be puzzled… [laughing out profusely]… progress reports I supposed to back up these… but there is no technical support*

R: Any recommendations on how best we can deal with these problems?

P1: *Well regulating the industry is essential and we shall accredit the academic programmes by benchmarking with the South African institutions… professional must be registered accordingly… these area deserves some serious funding from the start [the interviewee went on with local examples and chatted about the poor practices he came across]*.

Interviewee Two (Code P2)

(*Audio Ref.: 20150818100533- 1143*)

This interview was held in the Participant's office at 10:05, August 18, 2015 the same day following the P1. He also preferred to use his first language (Sesotho) - with sporadic English usage.

R: Thanking you for your time sir, I will start by asking if you do have a PMO in your department.

P2: *No, this department used to be an architectural office… but I heard of two guys from a Technical university… but there is still no such office yet.*

R: So you run through a principal agent?

P2: *Yes sir, but this is only effective in small projects level… come to big ones… we are always under pressure because the rest of us normally come late when the project is already running.*

R: In essence how can you define risk management and its processes?

P2: *I don't know whether risk is an intentional problem… these are shortcomings emanating from the initiation stage… things must be identified… proper documentation is essential to curb problems.*

R: What are you doing when running the project?

P2: *Well project meetings are there… records may be there… but the major problems are with design and procurement.*

R: So in context you mean this impedes the proper acquisition of suitable contractors?

P2: *Exactly.*

R: So you imply that there's no RM plan?

P2: Yes... *beside the fact that this is something new to me… it will be impossible to implement such initiatives because we rarely meet or discuss such problems at the project meeting level… there is no motivation… funds shall be available for that area.*

R: So you manage by contract clauses?

P2: *Yes... but the local contractors are not conversant with such clauses hence some of the clauses are not enforced… overall things are done intuitively… things are not*

proactive… other things are a result of lack of facilities; especially for communications… we are forced to use our cell phones.

R: So with initiation and procurement there seem to be major problems?

P2: *Yes… compared to South Africa, things tend to delay longer than expected… I am aware that our procurement system is time consuming and scopes are not clear… the other thing is that local contractors usually delay payments of subcontractors, hence my work is over-stretched… I am not sure whether the IFMIS system is understood properly by the Finance Ministry… cost overruns and variation orders are incurred… people are being incapacitated by the Government system, especially the Public Service Commission is not performing… I think there should be consultants or private sector agents to be employed to remedy the public procurement problems.*

R: Now, having identified these problems, how do you assess them?

P2: *We do have a QS division and we have regular brainstorming meetings… there is also a principal architect who oversees these… so reports are made… recommendations are made as to how best we can solve that… new specifications may be drafted.*

R: Basically, risks may be centred on probability and impacts…say extreme variations orders… how do you quantify such – and what tools are there?

P2: *I don't know that… in fact I was uncomfortable to discuss this topic with you because it's a shame we don't know such… people should be trained in this area and the office must be established for that… it's really a non-existing aspect in this department… you can ask anyone around… we are not sure about that sir [he made numerous comments regarding the actual problems they encounter].*

R: When analysing the project, where and when do you think risks become problematic… following these identified stages …? [Referring to the project phases]

P2: *I think… many problems start at the beginning however some manifest themselves later… materials specifications are typical examples where things tend to be overlooked and the contractors take advantage on that… so the tendering process becomes ineffective…*

R: So you believe the project manager is essential?

P2: *Yes, we need to outsource this service to a private agent or consultant from the beginning… hence this ongoing construction regulation process I don't believe it will be effective if it is being drafted by our Ministry where there are no Project Managers… we don't have that capacity… so we don't have the PM culture… [we were interrupted and excused for few minutes]… so the private sector with appropriate skills must be engaged where necessary.*

R: How do you perceive the level of RM in public projects?

P2: *Very low, we need to appreciate the specialised tools… project management deserves requires adequate attention for training for quality [referring to value for money]*

R: Now referring to the scale [Likert scale]… how can you allocate the impact of risks across the PLC stages?

P2: *[The interviewee indicated that risks will start at high scores and tend to decrease as the project near close-out]*

R: Regarding the knowledge areas, what impact do you think risks will have on the other eight knowledge areas? [Examples are given to explain what each entails].

P2: *They are entirely on a stand point that we don't have coordinated work… specifications are inappropriate or inadequate hence there are serious consequences… [he continued scaling the rest]*.

Interviewee Three (Code P3)

(*Audio Ref.: 20150818112649*)

This interview was held in the Participant's office at 11:26, August 18, 2015. He also preferred to use both Sesotho and English. He emailed me the general project information on the 23rd September as this required confirmation from his colleagues.

R: Can you kindly explain who is involved in your project team?

P3: *Well people involved are basically from the contractors… well they register with us and we oversee that they are complying with the categories stipulated… issues like tax compliance etc are also administered…*

R: According to your understanding, how best can you describe risk management and its processes?

P3: *Well risk management… I believe this is an area of project management whereby project duration and cost data are managed, monitored, and controlled with more emphasis on risks affecting the project status… someone must oversee this role.*

R: So you believe it's a PM knowledge area?

P3: *Yes.*

R: So you do have a project management plan?

P3: *No… we simply work without any standard… be it a structural engineer, a QS, etc… there are no milestones… things are incomplete… and an architect naturally becomes the principal agent and we are overwhelmed by the workload as we are supposed to oversee the coordination process of all project activities… we are short of human resources.*

R: So in managing the risks, how do you carry out such…?

P3: *Ermm… well meetings are there to address and mitigate technical issues through brainstorming… this is where we identify risks, find solutions and assign roles…*

R: Are these meetings formal?

P3: *Yes mostly… unless we are not all attending…*

R: Are they reliable?

P3: *Yah… in most cases but this depends on the assigned person's commitment… the action part is where the problems lie.*

R: We have nine PMI knowledge areas for your information as shown on that table [referring to the mini questionnaire]… inclusive of risk management… so what do you regard the identified risks' impact on these knowledge areas?

P3: *Well starting with integration… things are not going well… especially technology wise… so this has a major shortfall on the design process starting from the inception stage… our design processes are not coordinated well… our drawings in this project in particular were completed late while the tendering process was already on… they were incomplete.*

R: What about the scope?

P3: *Scope… eh… I think we are still incapacitated until the overlapping duties are sorted as we are overstretched… so the scope tends to be misdirected… I can only do work within my scope of work.*

R: Time and cost?

P3: *Time-wise affects both the contractor and us due to late payments and we don't have the powers to accelerate funds… the contractor's cash flow is affected considerably… consequently people will be laid off due to financial problems - hence the economy is affected too. So IFMIS is under utilised as people need to be trained about it.*

R: Quality?

P3: *I think this depends on us as designers… so we oversee that conformity is there… so relative to the above the problems we always strive to maintain the standards but time wise we end up extending and the contractor becomes demoralised… anyway time and cost overruns were incurred due to rework.*

R: The HR, procurement, and communications?

P3: *[The interviewee attributed the aforesaid problems to the rest of the other areas by stating similar implications on to the project]*.

R: How do you assess and analyse risks?

P3: *Well… the contractor through the fortnightly meetings… we normally review the progress through the programme critical path, cash flow… using known software… the reporting is there but I believe that is not enough.*

R: Do you have tools like risk registers?

P3: *No.*

R: Anyway what impact do the identified risks have on project phases?

P3: *Well… when the project starts on the wrong foot I regard the impacts are all major… [he made examples of how things may escalate e.g. the incomplete designs and geotechnical aspects pose major problems across all the phases]…*

R: Closeout?

P3: *Well we are closer to that… I can't clearly say much…*

R: Well how likely are these risks on each stage?

P3: *[He graded his perception solely around the fact that it all begins with design whereby the initiation scored less, while the following stages scored higher in risks likelihood as he believed the operational stage becomes demanding]*

R: How can you scale the impact of risks on other eight knowledge areas?

P3: *[The interviewee graded his perception on the impact of the risks on the other knowledge areas on a given tables]… among others he mentioned that time and cost were similarly affected.*

R: Any recommendations?

P3: *The GoL must capacitate our Ministry - especially the issue of IFMIS which is not tailored for our projects, hence there must be a unique system that addresses our problems. People with construction project management qualifications must be hired and training for those already in the ministry must be made available… we need continuous training… I do believe we need a dedicated risk management team… and part of the project's money must address that…*

Interviewee Four (Code P4)

(*Audio Ref.: 20150902112602*)

This interview was held in the Participant's office at 10:20, September 21, 2015. There was a mix of both Sesotho and English languages. The interviewee welcomed me whole-heartedly. Before we started, I introduced myself and we briefly chatted about the research.

R: This research has been grouped into three elements, i.e. these being RM basis, the RMP, and the perceptions… so what kinds of risks have you identified and how do you work with them?

P4: *Eh… I believe we encounter financial-related risks and incomplete design specifications that are normally sent to the construction site… so the financial* report *forms the basis for reporting to the stakeholders about the financial standing…*

R: So if you have become aware of these risks… what do you normally do when dealing with them?

P4: *It all depends because all projects are unique… it all depends for example... it might have different people and information… sometimes it might have limited information but full of provisions that means you will have to have contingency allowances to mitigate the risks… depending on how confident you are… the richer the information the lesser the contingency, the lesser the risk.*

R: So as a [profession omitted] in this project… specifically what are the challenges?

P4: *You know… I am still new in this project… initially in the bill document we make provisions through allowances… otherwise… because… if we go to the extent of over measuring we might have disputes with the contractor - these affect the work scope negatively to an extent of… things like disputes… so we normally go back to the contingency… we measure accurate [unclear]… or otherwise the other two will be to include in your document more especially when you are working with junior architects or people who are new… [making an example] you can put your own specification on average rates in case a problem arises with prices you are safe.*

R: So when adjusting your prices, do you use known tools, say *Haylett formula* or *CPAP* [making examples]?

P4: *Ah… here they are using an old 1979 formula which I basically never used before… in Lesotho the JBCC is not practiced.*

R: So having learned these adversities… how best can these risks be dealt with?

P4: *I think the best is to start the tendering process with full information… which is not always the case… because we always have problems with provisional amounts [unclear]… and price escalations be factored in because the other risks we cannot avoid are clients issues like late payments… these stop the projects. So, this needs to be addressed otherwise… financial allocation of projects shall be considered separately… construction projects takes large sums of money… IT projects are not the same as construction projects.*

R: Can you please weigh your perceptions on these tables (introducing the Likert scales].

P4: *At the initiation stage, there is less information… so I think risks… well we only do planning after all the projects have been initiated… so we carry out from the design stage. So initiation to us will be a different aspect…*

R: So can you take it from design.

P4: *Risks will be the misinterpretation of the client requirements by the client himself… there will be additions… we don't see them at planning stage but these manifest themselves immediately when we arrive at the site [making examples]… lack of information is rife… the other one will be human error due to lack of support and limited resources… [he graded his perception]*.

R: What about the execution stage?

P4: *Information is still a problem as the contractor needs the measurements of components as we normally measure in bulk… so he requires accurate details and dimensions [making examples with customised components]… things like these are forcing variation orders, hence these are major.*

R: Closeout stage?

P4: *Dissatisfied clients result in rework and this normally affect the product as it may take longer before commissioning.*

R: So talking about the eight knowledge areas… what impact can these risks have on them?

P4: [His concern here was about the GoL level of budgeting and funding as a major issue affecting the areas among the aforesaid risks when scaling using varied examples]… *the funding problem is costing the government a lot. Regarding time and cost I think you should have got an eight in your scale because I believe five is insufficient [jokingly]… here we work without a basis… we don't have quality control measures and standards… professionals don't want to work in the public service so only those with limited experience and qualifications are top managers… shortage of qualified staff impact most of these areas… irregularities in procurement processes that are triggering corrupt practices… there are serious loopholes that discourage contractors and affect productivity… our procurement system is not transparent. The construction industry needs to be regulated.*

Cases 2 & 3: Double Cases

Interviewee Five (Code P5)

(*Audio Ref.: 20150901153835*)

This interview was held in the Participant's office at 15:38, September 01, 2015. The department secretary had organised our meeting. The meeting was short and brief. P5 was covering both Cases 2 and 3. His deliberation was addressing both cases at a central office. When asked if there weren't any project specific issues, he mentioned that they were similar in characteristics but differed in scope.

R: How can you explain risks management?

P5: Well… *risk management is about managing projects in such a manner as to tackle and minimise risks in order to successfully achieve the project goals. It is concerned about alleviating the challenges on the project.*

R: How do you work with risks and who is involved?

P5: *At the time you sign the contract, that document already specifies who is going to be in charge… so normal risks which are incurred by the client are weather related and our management strategy is to accept them by compensating the contractor depending on their impact - hence extensions of time with associated costs. These are generally accepted. However there are still some risks that belong to the contractor like those that are technical and operational in nature.*

R: What type of contract do you have?

P5: *It is employer's design and contractor built.*

R: Meaning it is a bill of quantities?

P5: *Yes.*

R: Meaning he is supposed to procure and deliver materials on site… and submit the work plan.

P5: *Yes…he must submit the programme with an expectation that he complies with our time frame [his phone rang and session paused]… we should have given him the construction period during the tender period with the bill of quantities and design for the work to be done within such and such period… he will then bid accordingly and making allowances for risks and we would have told him the conditions of contract, the*

type of documents and the type of information we are going to adopt which will collectively form a contract between him and us. So when he bids he had already assessed the risks' types… in most cases you will find that he will be under his P&Gs where his insurances are included.

R: Meaning he apportions risks under the P&Gs?

P5: *Yes… in his P&Gs that is where he will address and manage risks.*

R: So yours is to ascertain that he has adequate insurances?

P5: *Yes… yes… we make sure that the works are adequately insured.*

R: It is an expectation that project management must be given a special attention… meaning it must clearly be covered in the project scope… so is there a way you have defined it?

P5: *Specifically as risk management… no… because the reason being… ermm… we are in a field whereby people have been doing it for hundred years plus… we do have the standard conditions of contract like FIDIC [making examples with some organisations] we have adopted… contracting is a basis for risk management… therefore these conditions are considered to have been… over when people experience risks in a field learned about the inherent risks… so you won't find a stand alone document in a project called a risk management plan. Then… [he paused]*.

R: In essence that's part of your risk management plan, is that how you approach it?

P5: *Yes… so when you are designing or preparing your project, then you go to the standard documents where you think because of the nature of your project you need to modify any one of the standard documents; then we will be having a special or project specs or special conditions of contract which will be project specific. That is where you will be addressing special risks.*

R: So it's about modifying to address the risks?

P5: *Yes… yes… say there is a standard clause - say no. 47 for arguments sake, you will be doing… in your special conditions you will say 'delete this and append that'.*

R: So it is revised periodically when addressing the type of contract?

P5: *It becomes project specific.*

R: So are they always effective?

P5: *So far… look [giggling] eh… contracting or project management according …according to me is not an exact science like accounting or mathematics… as far as possible you try to cover yourself - but you are not going to cover all the loop holes.*

R: So these risks having been identified, are going to be addressed by the terms of contract?

P5: *Yes… yes*

R: So there are no omissions?

P5: *No… but then, things being the way they are, you will find one of the biggest risks is interpretation.*

R: On the side of the contractor?

P5: *Both sides, you will find us interpreting a term this way while they interpret the same condition differently… you can end up in a very acrimonious contract where there are claims that are exceeding the original cost due to escalation of costs… [making an example]… some of the risks that normally occur include the availability of the site to the contractor…private property… these are some of the grey areas that hamper the contractor's production… so managing such becomes a challenge.*

R: Can we say this is a uniform challenge?

P5: *Yes… people came to us to be compensated for intrusion into the property.*

R: Is there adequate support for such challenges?

P5: *The issue of litigation isn't the major challenge concerning necessary support… sometimes our risks emanate from inexperience coming from ourselves… environmental concerns also have become major issues in the construction industry… you won't find a specialist environmentalist relevant to construction…[making examples]… such brings additional risks like litigation expenses emanating from an inappropriate scope.*

R: So these road projects encounter similar challenges?

P5: *Yes… another thing with the local contractors is that they are always helped 95% of the time because they are inexperienced they present performance risks in terms of time and quality… they don't even know that they are entitled for an extension… they don't know how to produce a programme. However, these experienced ones encounter cost related risks.*

R: In which area do you think we are still lacking?

P5: *Here as a client organisation, we need qualified personnel… young and inexperienced people are being given big tasks and projects are jeopardised. Coming to contracting, people must be capacitated. Sufficient training is essential…[making an example]… we take cautious decisions when trying to capacitate under qualified people… government doesn't seem to retain and attract talent.*

R: How much do your escalations amplify?

P5: *Well we make provisions for that through escalation clauses… [making examples]… inflation especially in bituminous products is a major risk.*

R: Can you place scale your perceptions in the following tables?

P5: *At the initiation stage risks are low, but at planning and design… that is where you are likely to go wrong… but you are going to feel then… I am not sure what I can scale… em let me put it at midpoint and increases to very high at execution. At closeout…let it be medium.*

[He then rated the impact on the other knowledge areas without giving reasons. Then he signed off the informed consent letter and we closed the chapter amicably.]

<u>Part 2</u>: Reconstruction and Field Notes from Non-Recorded Interviews.

This section presents field notes from non-recorded interviews conducted at the respective interviewees' offices and sites. Note: these interviewees' did not want the interview sessions to be recorded.

Case 1:

Interviewee Six (P6)

(*Field notes Ref.: 201509281130)*

During my visit to the main office, I met the senior quantity surveyor who was reluctant to participate in this research and she referred me to the project manager. This interview was held in the Participant's office at 11:30, September 28, 2015. This followed my email I sent attaching the letter requesting an interview and the interview schedule on the 24th September. I also requested his work programme for analysis on the same day and it was emailed at 15:34.

I was warmly welcomed in his office at the agreed time and venue. I first presented him the Informed Consent to be read and signed. He had no problem and I assured him about the levels of confidentiality and anonymity that are entrenched in this research.

P6 asked about the nature of this research and how it is relevant to him. His main concern was that his employer was very firm about the need for secrecy on some project issues. He was also not sure whether he would be able to address most of the structured questions after I had given him a copy. I mentioned that he must feel free to answer neither what he knows relative to the project and nothing more nor less.

I first asked him if there was a project management office in his firm. He indicated that the quantity surveyor (QS), the construction site manager, and he constituted the project team. He mentioned that he was working on equal capacity with the QS. When asked whether there was a risk management plan in place. He was not sure about it and asked me to explain. I showed him an example from one of the project management books I was carrying. He shook his head to disagree.

I asked him to define risk management and its processes. P6 mentioned risk management as *one of the project manager's roles and responsibilities in managing the projects*. However, he indicated that he was not sure of its processes. I continued to the risk identification process and P6 mentioned that this process was carried out informally and they usually perform brainstorming sessions with the client team fortnightly. At the Initiation stage, risks that they normally identify are related to incomplete designs from the client team. He indicated that this have a direct impact on contractor's cost and time performance. At the construction stage, he mentioned that there are mounting costs and time problems. Furthermore, lack of client/ GoL intervention, red tape, frequent variation orders, preliminaries and general (P&Gs) escalation, and inadequate supervision of the client nominated subcontractors had a direct impact on their work plan and cost performance. At the close-out stage, P6 stated that the subcontractors issues remain unresolved and logistical problems were rampant.

When asked how they assess and analyse the identified risks, P6 said that the critical path method was their chief tool for assessing risks. He mentioned that brainstorming sessions were preferred means of responding to risks. They would discuss the likely impact of identified risks and suitable solutions. This method was reliable but some risks would still emerge and become difficult to deal with.

P6 presented his perceptions relative to risks' probability and impact on the tables provided. However he didn't divulge any explanations when he was scaling different stages and knowledge areas. His main reason was that the risks were not adequately addressed and the execution and closeout stages were prone to mounting project risks which were institutional, political, technical, and financial in nature.

His recommendations were that the planning and design stage must be afforded adequate attention as most risks were emanating from incomplete designs, specifications, and details. He also emphasised that the PMO is a must as they are short of qualified project and construction managers to assist them.

Cases 2 & 3: Double Cases

Interviewee Seven (P7)

(*Field notes Ref.: 201509301400)*

This interview was held in the Participant's office at 14:00, September 30, 2015. The departmental secretary had organised our meeting. However, it took him time to confirm the exact date of the appointment. P5 had referred me to him as he had specific details for both the projects (two cases). He basically addressed both cases as they were similar in terms of characteristics but had differing scopes. Therefore, his response was general as both projects were centrally managed by his office. He emailed the Case 2 and 3 general project information on the 22nd October and 23rd September respectively as he needed more time to confirm with his colleagues.

When asked about the existence of the project management office, P7 indicated that they do have a team constituting the director general, the director of development, the contracts manager, the senior project engineer, and the project engineer. He mentioned that there's no actual risk management document but that they relied heavily on the contract clauses which are consistent with its form which is project specific and adheres to standard guidelines. Therefore, the procedures for managing such risks are based solely on the contract terms and provisions. He mentioned risk management as a project specific area concerned with managing project challenges in order to achieve the stipulated objectives.

P7 indicated that because the contract becomes an essential component for RM, it constitute the tools for identifying and assessing the risks which included inclement weather and political risks. He mentioned that a rainfall formula was used as a standard tool for assessing and analysing extreme precipitation. He further stated that a critical path analysis was also used to substantiate any delays incurred by the construction team. So the client team was in charge of assessing and analysing risks.

In responding to the identified and assessed risks, P7 stated that design related risks will naturally be taken by the client/ GoL, especially when they were faulty or late. Changing cost risks were allocated predetermined annual allowance. These risks would normally be shared by the client and the contractor. Negative risks would be transferred, while positive risks were retained by the client. Issues pertaining to site access are the responsibility of the client. Furthermore, any standing time arising from the client's non performance of duties results from the contractor making claims and vice versa. Meanwhile unforeseen ground conditions are the client's responsibility hence the contractor would claim additional costs without profit. Political related issues were established through negotiations whereby the most cost effective option would be taken. However the client is excused from anything that happens on site, whether it is labour or safety related.

When asked about the support they received, P7 indicated that the consultants' primary duty was to advise and recommend RM strategies where deemed necessary.

P7 regarded the level of RM in both cases as being 'okay'. However he recommended that there should be a regulatory framework for the built environment and its professionals. He believed the level of professionalism among his peers was something of concern and that they must be brought up to the internationally accepted level. Adequate funds must be made available to prop up risk management. He eventually graded his perceptions on the given tables without giving any specific reasons as he regarded the aforesaid problems being the primary issues that dictated his judgment.

Case 2:

Interviewee Eight (P8)

(*Field notes Ref.: 201510161415)*

This interview was held in the Participant's site office at 14:15, October 16, 2015. The District Administrator (DA) Office provided a letter requesting permission to conduct

research (Appendix I). This was also backed by calls from the RD requesting such permission. I visited the site office which was remote from town at the scheduled time. I arrived there after lunch time while the interviewee had just come back. Fortunately he was able to speak English fluently. He asked not to be recorded.

When asked about his project management office, the interviewee indicated that there is a project team consisting of a senior project manager, assistant project manager, general engineer, a SHEQ officer, business manager, and an operations manager. The team members were all based on site.

When asked about the existence of a risk management plan, he showed me a generic risk management framework. However the contents were in a foreign language and I had to ask for his explanation. First and foremost, he indicated that the framework addresses the risk identification process, followed by the risk assessment, risk response, action, and controlling and monitoring. Next to each process, there were sequenced activities to be followed. It was elaborate and addressed health and safety issues on site. During a close inspection, I realised that the team members were assigned their roles and responsibilities. There were exhaustive remedial steps and interventions. However there were no clearly formulated expected outputs under each activity.

The identification processes was based on daily brainstorming sessions including SWOT analyses, contract document reviews, historical data analyses, and case comparisons while the risk assessment adopted P-I reporting, evaluation, daily and weekly reports to the head office.

When asked about the problems they encountered throughout the project, he mentioned that at the initiation phase, there had been serious time and communication issues arising from accessing the community property, especially graveyards and farming fields. At the planning and design phases, these problems were mounting as residential properties had to be planned for reallocation and compensation. At the execution stage, there were security issues like frequent robberies on site, pilfering, and health and safety related issues like workers under the influence of alcohol and dagga. He couldn't say anything about the closeout stage as they were still a phase away. He then graded his perceptions on the provided scales. Finally, he indicated that they received adequate support from the client and their head office, depending on the seriousness of the issue on hand.

Case 2:

Interviewee Nine (P9)

(*Field notes Ref.: 201510161520)*

After completing the interview session with P8 on the same day at about 15:30, I then visited interviewee P9 who was also based on site. P9 mentioned that he was already busy due to some urgent stuff he needed to complete that afternoon. However he welcomed me and indicated that he would feel constrained if recorded. I then assured him that the session would be brief and that there would be no recording.

He mentioned that he was working under the terms and conditions of the employer/ client. Therefore, most of the required documents and standards were under the client. So the risk management plan was not required from his according to the explanation.

I therefore asked if there were project unique challenges that he had encountered. He mentioned that unclear terms of references (TORs) are basically the problem areas in public projects. He stated that on numerous occasions there had been crucial design and information omissions. The design details were inadequate and not appropriately revised to suit the current project.

P9 mentioned that there were design inconsistencies and sometimes lack of performance from the client team. According to him there were also evident irregularities that hampered the bidding process. He attested that these initiation and planning problems had escalating impacts on the following project phases. Furthermore, he recommended that the government must provide sufficient support for consultants and that independent consultancy services must be appointed for the promotion of quality and professionalism in public projects.

Case 3:

Interviewee Ten (P10)

(*Field notes Ref.: 201510011312)*

The meeting was held at the responded site office on the 1st October 2015 at 13:12. As he was still busy, I asked him to finish off the remainder of his work as I waited. He mentioned that he would was alone at that time as his senior was off to RSA.

When asked about the risk management, he described it as '*a systematic approach that is used for minimising the project challenges*'. Regarding the RMP, he outlined that '*it summarises the series of steps taken when managing risk'.* However he was unable to provide a risk management plan with an understanding that the terms of contract form a basis for such. He mentioned that the preliminaries and generals (P&Gs) item make provisions for insurances, work risks, security, and indemnities among others.

I asked him about the problems and impacts that they have encountered since the start of the projects. He mentioned that the labour issues especially shortage of skilled labour from the start of the project was already worrying. The regulations forced them to hire locals at the expense of quality and production. This was followed by the medical screening process whereby the majority of the locals will be unfit for harsh working environments yet they were still forced to retain them. He regarded this as a least cost effective measure which had serious financial ramifications on the budget. Work related health and safety issues were soaring due to frequent medical checkups and reported ill-health incidents.

Accessing community property was a lengthy and sensitive issue which required stakeholders' involvement. The communication area was over stretched and locals would resort to disputes due to mounting frustrations. There were regular relocation claims and compensations which were throughout the project. These had a serious financial impact too. Furthermore, royalties had to be negotiated before accessing barrow pits but the government was always handling this unless there were no initial agreements with the stakeholders. Constant plant repairs and importation of parts which were not available locally had serious cost and time related impacts. Inflation and political state of affairs in the country were perturbing factors throughout the project. There was also a mention of irregular bituminous supplies from the RSA which had serious impacts on time (programme) and cost (due to standing time).

He was allowed to scale his perceptions regarding the likelihoods and impacts on the provided tables.

Case 3:

Interviewee Eleven (P11)

(*Field notes Ref.: 201510141100)*

A brief telephonic session was conducted as a follow up of the initial emails requesting a meeting with interviewee P11 since 14th October 2015. P11 indicated that the project was adequately risk managed. He indicated that the conditions of contract formed the basis for managing risk throughout the PLC. Risks were identified through brainstorming sessions. Risk with major impacts included political, financial, technical, and environmental.

The current political state-of-affairs in Lesotho was regarded as volatile and uncertain for the construction contracting. There were also numerous concerns regarding the safety of the employees during work. Delays in government payments were considered as a major drawback affecting the project cash flow. Meanwhile, lack of qualified and experienced local staff affected the schedule and quality of the work, while inclement weather was regarded as one of the frequent climatic problems.

P11 believed these adversities can be mitigated but there was no adequate time to address them. He concluded by stating that there is still a room for improvement if the government is willing to regulate and involve private stakeholders in public projects.