

**THE ROLE OF MINING COMPANIES IN ROAD INFRASTRUCTURE
DEVELOPMENT IN MINERAL EXTRACTION AREAS: A CASE STUDY
OF SELECTED MINES WITHIN FETAKGOMO-TUBATSE LOCAL
MUNICIPALITY**

by

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A dissertation submitted in fulfilment of the requirements for the degree

MASTER OF ADMINISTRATION

in the

School of Development Studies

FACULTY OF ECONOMICS, DEVELOPMENT AND BUSINESS SCIENCES

UNIVERSITY OF MPUMALANGA

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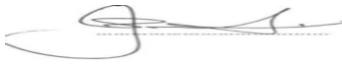
May 2025

Declaration

I hereby declare that this dissertation, entitled '*The Role of Mining Companies in Road Infrastructure Development in Mineral Extraction Areas: A Case Study of Selected Mines within Fetakgomo-Tubatse Local Municipality*', is the result of my own independent research, except where specific references have been made. In addition, I declare that all sources of information, including data, ideas, and quotations from other scholars, have been duly acknowledged and properly cited in the Reference Section of this report.

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Acknowledgements

I would like to express my deepest gratitude to Almighty God, the Creator of all, for His guidance, strength, and wisdom throughout this journey. Without His divine presence, I would not have been able to reach this significant milestone.

I extend my heartfelt thanks to my supervisor, Dr. Rasodi Manyaka, whose availability, understanding, and unwavering support have been invaluable. His keen interest in my research and willingness to guide me toward its completion have made all the difference. To my co-supervisor, Dr. Themba Lukhele, I am profoundly grateful for your insightful contributions and invaluable guidance, which helped refine and enrich this study. His constructive criticism pushed me to achieve my best. I also wish to acknowledge Dr. Bonga Mdletshe for always being a beacon of knowledge and direction in my research journey. His mentorship and willingness to help at every turn have been a source of great encouragement.

To the municipal officials of Fetakgomo Tubatse local municipality, I am very grateful for their cooperation and insights. Their contributions have been essential to understanding the broader context of this study.

To my siblings, Leon Moyo, Sithabile Moyo, and Siphamandla Moyo, thank you for your unwavering support, encouragement, and belief in me. To Khwezi, your love and constant cheerleading have been my source of strength and motivation. This journey would not have been possible without them. I extend my heartfelt gratitude to my colleague and friend, Sipho Shiba, for his unwavering support and encouragement, particularly during moments of overwhelm.

Lastly, I would like to thank my language editor, Dr. Nelson Ratau, for his meticulous attention to detail and dedication in refining this work. His expertise has been instrumental in ensuring clarity and coherence in this study.

Dedication

This study is dedicated to my late parents, Beatrice Ndlovu and Edgar Moyo. Although they are no longer with me in this physical world, their enduring love, guidance, and values have been a constant source of strength and inspiration throughout this journey. I firmly believe that they watched over me as my guardian angels, offering silent encouragement and wisdom during the challenging moments of this research. Their unwavering spirit and the lessons they imparted have shaped me into the person I am today, and it is with deep gratitude and reverence that I dedicate this work to their cherished memory. May this study stand as a testament to their enduring legacy and the profound impact they continue to have on my life.

Abstract

The study investigated the role of mining companies in the development of road infrastructure within mineral extraction areas, specifically focussing on selected mines in the Fetakgomo Tubatse Local Municipality (FTLM). Recognising the importance of public-private partnerships (PPPs), the research explored how mining companies, through their Social and Labour Plans (SLPs), contribute to addressing road infrastructure development challenges in local communities.

Methodologically, the research adopted a qualitative approach, employing document analysis and semi-structured interviews with key participants from both the municipality and mining companies as tools for data collection. Despite the limitation of not getting direct interviews with companies, secondary data provided critical insights. The findings reveal a complex interaction where the contributions of mining companies are significant but constrained by regulatory, logistical, and financial challenges.

Based on these findings, the main conclusions of the study are that improving collaboration through improved PPP frameworks can optimise the development of road infrastructure, thus supporting sustainable local economic growth. One of the main recommendations of the study includes fostering clearer guidelines for collaboration, addressing capacity building for local municipalities, and expanding the roles of mining companies beyond existing commitments.

Keywords: Infrastructure, mineral extraction, collaboration, public-private partnerships

Table of Contents

DECLARATION.....	II
ACKNOWLEDGEMENTS	III
DEDICATION.....	IV
ABSTRACT	V
LIST OF TABLES.....	X
LIST OF FIGURES.....	XI
LIST OF ABBREVIATIONS	XII
1. CHAPTER 1: INTRODUCTION AND BACKGROUND	1
1.1. INTRODUCTION.....	1
1.2. PROBLEM STATEMENT.....	3
1.3. RESEARCH QUESTIONS	4
1.4. RESEARCH AIMS AND OBJECTIVES.....	5
1.5. DEFINITION OF KEY CONCEPTS	5
1.6. OUTLINE OF THE STUDY	7
1.7. CONCLUSION	7
2.1. INTRODUCTION	8
2.2. THE EVOLUTION OF PUBLIC ADMINISTRATION AS A DISCIPLINE	8
2.2.1. EARLY FOUNDATIONS OF PUBLIC ADMINISTRATION	8
2.2.2. POLITICS-ADMINISTRATION DICHOTOMY (1900-1926).....	9
2.2.3. PRINCIPLES OF ADMINISTRATION (1927-1937)	9
2.2.4. THE ERA OF CHALLENGE (1938-1950).....	10
2.2.5. IDENTITY CRISIS (1956-1970).....	11
2.2.6. NEW PUBLIC MANAGEMENT (1970).....	12
2.2.7. NEW PUBLIC GOVERNANCE (1990)	14
2.3. THEORETICAL FRAMEWORK	14
2.3.1. STAKEHOLDER THEORY	15
2.4. CONCEPTUAL FRAMEWORK	18
2.4.1. INFRASTRUCTURE DEVELOPMENT.....	18
2.4.2. ROAD INFRASTRUCTURE	19
2.4.2.1. <i>Components of Road Infrastructure</i>	20
2.4.3. PUBLIC-PRIVATE PARTNERSHIPS	21
2.4.4. MUNICIPAL SERVICE PARTNERSHIPS.....	22
2.4.4.1. <i>The Importance of Municipal Service Partnerships</i>	22
2.4.5. <i>New Public Management (NPM)</i>	24
2.4.6. POST- NEW PUBLIC MANAGEMENT.....	25
2.4.7. CORPORATE SOCIAL RESPONSIBILITY.....	26
2.5. CONCLUSION	27
CHAPTER 3: ROAD INFRASTRUCTURE DEVELOPMENT IN MINERAL EXTRACTION AREAS – LITERATURE REVIEW	28
3.1. INTRODUCTION	28

3.2. ROAD INFRASTRUCTURE.....	28
3.2.1 ROAD INFRASTRUCTURE IN SOUTH AFRICA.....	29
3.3 OVERVIEW OF THE DEVELOPMENT OF MUNICIPAL ROAD INFRASTRUCTURE	32
3.4. MINING AND ROAD INFRASTRUCTURE DEVELOPMENT: A GLOBAL PERSPECTIVE	33
3.5. HISTORICAL CONTEXT: IMPACT OF MINING ON SOUTH AFRICAN COMMUNITIES.....	34
3.6. THE EVOLVING ROLE OF MINING COMPANIES	36
3.7. CASE STUDIES: SUCCESSFUL ROAD INFRASTRUCTURE PROJECTS	37
3.7.1. CONSTRUCTION OF A ROAD (KLEIN NEIRA TO CHURCHILL)	37
3.7.2. CASE STUDY 2: INFRASTRUCTURE AND POVERTY ERADICATION PROJECTS BY DWARSRIVIER MINE 2016-2020.....	38
3.7.3. CASE STUDY 3: ANGLO AMERICAN KUMBA IRON ORE ROAD PROJECTS	38
3.7.3.1. <i>Kathu Road Upgrades</i>	39
3.7.3.2. <i>R31 Road Rehabilitation</i>	39
3.7.4. CASE STUDY 5: ASSMANG’S KHUMANI MINE ROAD DEVELOPMENT CASE STUDY	39
3.8. STATE OF ROAD INFRASTRUCTURE IN MINERAL EXTRACTION AREAS.....	40
3.8.1. EMALAHLENI LOCAL MUNICIPALITY (ELM) MPUMALANGA	41
3.8.2. RUSTENBURG LOCAL MUNICIPALITY (RLM) NORTHWEST	41
3.8.3. NORTHERN CAPE PROVINCE	42
3.8.4. LIMPOPO PROVINCE	43
3.9. CONCLUSION	44
4.1. INTRODUCTION	45
4.2. RESEARCH PARADIGM	45
4.2.1. POSITIVISM.....	46
4.2.2. POST-POSITIVISM.....	46
4.2.3. REALISM.....	47
4.2.4. PRAGMATISM.....	47
4.2.4. INTERPRETIVISM	48
4.3. RESEARCH DESIGN	49
4.3.1 NARRATIVE RESEARCH	50
4.3.2 PHENOMENOLOGICAL RESEARCH.....	50
4.3.3. GROUNDED THEORY	50
4.3.4. CASE STUDY	51
4.4. RESEARCH APPROACH	51
4.4.1. QUANTITATIVE RESEARCH METHODOLOGY.....	51
4.4.2. QUALITATIVE RESEARCH METHODOLOGY	52
4.5. DESCRIPTION OF THE STUDY AREA	54
4.6. RESEARCH POPULATION.....	55
4.7. SAMPLING	56
4.8. DATA COLLECTION INSTRUMENTS	57
4.8.1. SEMI- STRUCTURED INTERVIEWS.....	57
4.8.2. SECONDARY DATA	59
4.9. DATA ANALYSIS	59

4.9.1. THEMATIC DATA ANALYSIS	60
4.9.2. CONTENT ANALYSIS	60
4.10. ETHICAL CONSIDERATIONS	61
4.10.1. INFORMED CONSENT	61
4.10.2. CONFIDENTIALITY AND ANONYMITY	61
4.10.3. TRANSPARENCY AND ACCOUNTABILITY	61
4.10.4. INTEGRITY	62
4.10.5. VALIDITY AND RELIABILITY	62
4.10.6. ACCURACY	62
4.10.7. COMPLETENESS	63
4.10.8. TRUSTWORTHINESS	63
4.11. CONCLUSION	63
CHAPTER 5: PRESENTATION, INTERPRETATION AND ANALYSIS OF FINDINGS	64
5.1. INTRODUCTION	64
5.2. DEMOGRAPHIC INFORMATION OF PARTICIPANTS	64
5.3. RESEARCH ANALYSIS	65
5.3. THEMES BASED ON INTERVIEW QUESTIONS	66
5.3.1. DEVELOPMENT OF ROAD INFRASTRUCTURE	68
5.3.2. MINES ROLES IN ROAD INFRASTRUCTURE DEVELOPMENT	70
5.3.3. MINING-MUNICIPAL COLLABORATIONS	74
5.3.4. CHALLENGES IN ROAD INFRASTRUCTURE DEVELOPMENT IN THE MUNICIPALITY	78
5.3.5. ENHANCING MINING-MUNICIPAL COLLABORATIONS	81
5.3.6. BEST PRACTICE IN COLLABORATIONS	85
5.4. KEY FINDINGS	88
5.5. CONCLUSION	89
CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS	90
6.1 INTRODUCTION	90
6.2. SUMMARY OF CHAPTERS	90
6.2.1. CHAPTER 1	90
6.2.2. CHAPTER 2	90
6.2.3. CHAPTER 3	91
6.2.4. CHAPTER 4	91
6.2.5. CHAPTER 5	92
6.2.6. CHAPTER 6	92
6.3. SUMMARY OF HOW THE OBJECTIVES WERE ADDRESSED	92
6.3.1. TO ANALYSE HOW MINING COMPANIES THROUGH THEIR SOCIAL AND LABOUR PLANS ARE ABLE TO CONTRIBUTE TO THE DEVELOPMENT OF ROAD INFRASTRUCTURE.	92
6.3.2. TO IDENTIFY THE FACTORS THAT INFLUENCE THE PARTICIPATION OF MINING COMPANIES IN THE DEVELOPMENT OF THE ROAD INFRASTRUCTURE IN FETAKGOMO TUBATSE LOCAL MUNICIPALITY.	93
6.2.3. IDENTIFY THE CHALLENGES FACED BY THE MINES AND FETAKGOMO TUBATSE MUNICIPALITY IN EXECUTING ROAD INFRASTRUCTURE DEVELOPMENT PROJECTS	94
6.2.4. COLLABORATION CHALLENGES BETWEEN MINING COMPANIES AND THE MUNICIPALITY	95
6.2.5. LONG-TERM IMPACT OF MINING COMPANIES' CONTRIBUTIONS	96
6.3. RECOMMENDATIONS	96

6.3.1. Addressing Road Infrastructure Gaps	97
6.3.2. EXTENDING THE CONTRIBUTIONS OF MINING COMPANIES BEYOND THE 20-KILOMETER RADIUS....	97
6.3.3. ENHANCING MINING-MUNICIPALITY COLLABORATION, THROUGH IMPROVEMENT OF PUBLIC-PRIVATE PARTNERSHIP FRAMEWORKS.....	97
6.3.3. BUILDING MUNICIPAL CAPACITY FOR INFRASTRUCTURE MANAGEMENT	97
6.3.4. LONG-TERM PLANNING FOR SUSTAINABLE DEVELOPMENT	98
6.3.6. INCORPORATING ENVIRONMENTAL RESILIENCE INTO INFRASTRUCTURE PROJECTS GIVEN	98
6.4. LIMITATIONS OF THE STUDY	98
6.5. RECOMMENDATIONS FOR FURTHER RESEARCH	98
6.6. CONCLUSION	99
LIST OF REFERENCES.....	100
ANNEXTURE A: INTERVIEW GUIDE FOR MUNICIPAL OFFICIALS	125
ANNEXTURE B: INTERVIEW GUIDE FOR MINES EXECUTIVES	127
ANNEXTURE C: ETHICAL CLEARANCE	129
ANNEXTURE D: INFORMATION LEAFLET	130
ANNEXTURE E: CONSENT FORM	132
ANNEXTURE F: LETTER TO REQUEST PERMISSION TO CONDUCT RESEARCH FROM THE MUNICIPALITY	133
ANNEXTURE G: PERMISSION LETTER FROM THE MUNICIPALITY	135
ANNEXTURE H: LETTER TO REQUEST PERMISSION TO CONDUCT RESEARCH FROM MINE A	136
ANNEXTURE I: LETTER TO REQUEST PERMISSION TO CONDUCT RESEARCH FROM MINE B	138
ANNEXTURE J: LETTER TO REQUEST PERMISSION TO CONDUCT RESEARCH FROM MINE C	140
ANNEXTURE K: LETTER TO REQUEST PERMISSION TO CONDUCT RESEARCH FROM MINE D	142
ANNEXTURE L: LANGUAGE EDITING CERTIFICATE.....	144
ANNEXTURE M: TURNIT IN REPORT.....	145

List of tables

Table 1: Pseudo Names.....	64
Table 2: Demographic data illustration	65

List of figures

Figure 1 Vertical linkages in an illustrative PPP structure.	17
Figure 2: Word Cloud	66
Figure 3: Themes	66
Figure 4: Network sociogram	76

List of Abbreviations

SLP – Social and Labour Plans

PPPs - Public-Private Partnerships

FTLM – Fetakgomo-Tubatse Local Municipality

IDP - Integrated Development Plan

NDP – National Development Plan

MIG – Municipal Infrastructure Grant

NPM – New Public Management

NG – New Governance

PPI – Private Participants in Infrastructure

NPA – New Public Administration

CSR – Corporate Social Responsibility

CSI – Corporate Social Investment

NPG – New Public Governance

CPA – Classical Public Administration

NPC, National Public Commission

EPWP – Expanded Public Works Programme

SANRAL – South African National Road Agency Limited

TBM – Tunnel Boring Machine

ITS – Intelligent Transformation System

UN – United Nations

BOT – Build Operate Transfer

MSP – Municipal Service Partnership

SDGs - Sustainable Development Goals

GDP – Gross domestic product

RMS – Road Management System

LED – Local Economic Development

1. CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1. Introduction

Over the years, governments around the world have recognised the need to involve the private sector in the delivery of public services. This emanated from the influence of new public management ideas. As a result, in the late 1990s and early 2000 governments around the world discovered that to facilitate the involvement of the private sector, the use of Public-Private Partnerships (PPPs) are an attractive investment option or innovative model of investment for this purpose (Auriol & Blanc, 2007; Fall, Marin, Locussol & Verspyck, 2009; Marin, 2009; Ruiters, 2013; Ruiters & Matji, 2016).). PPPs have become increasingly and widely used throughout the world since the 1980s (Quiggin, 2019; Whiteside, 2020; Fabre & Straub, 2021; Natalia, Tanzil, & Sari, 2021). The popularity of PPPs is attributed to limited financial resources in the public sector as a result of dwindling economic conditions. The World Bank Private Participation in Infrastructure (PPI) database lists more than 6,600 projects in low- and middle-income countries between 1990 and 2019 (Fabre & Straub, 2021) with private sector involvement. This strongly shows that PPPs have been widely used throughout the world. PPPs are preferred by governments and international organisations because they are seen as a panacea for investment in critical infrastructure projects. The World Bank (2017) estimated that the contribution of PPPs to the investments in social infrastructure is about 10% of the annual investment in infrastructure by developing countries' governments and around 3% of global spending on infrastructure (Engel, Fisher & Galetovic, 2020).

In 1999, South Africa followed the global trend of using PPPs for infrastructure development. This is evident in that in 1999, the National Treasury established an official PPP structure for the country (National Treasury, 2019). In 2000, the South African government established the PPP Unit within the National Treasury (National Treasury, 2019). The purpose of this unit was, among other things, to develop a comprehensive PPP framework and guidelines to provide a standardised approach to project development, procurement, and implementation. Although PPPs existed before, they were not subjected to a standardised procedure and, as such, did not receive formal recognition in South Africa (Walwyn & Nkolele, 2018). To date, PPPs continue to be an integral part of South Africa's approach to infrastructure development

and service delivery improvement. PPPs in South Africa gained momentum in the late 1990s and early 2000s as the post-apartheid government sought innovative solutions to address infrastructure backlog and to enhance economic growth in the quest to build a more inclusive society (National Treasury, 2019). This is understandable given the country's history of socioeconomic exclusion of black people. As such, the transition to democracy in 1994 marked an important turning point for South Africa. The post-apartheid government had a great responsibility of expanding the delivery of services to communities, the majority of whom were previously disadvantaged and excluded as a result of the apartheid system of governance. In trying to address the infrastructure backlog, the PPPs were introduced and used extensively by the post-apartheid government. The White Paper on the National Strategy for the Development and Promotion of Small Business in South Africa (1995) laid the foundations for private sector participation in infrastructure projects, including road infrastructure development projects. This white paper set the tone for the institutionalisation of the use of PPPs in infrastructure development. Despite the widespread use of PPPs, it is worth mentioning that the government still faces a significant challenge of addressing historic massive infrastructure backlogs.

The local government is said to be at the centre of service delivery (Mpangalasane, 2020). For this reason, municipalities are responsible for making massive investments in infrastructure development. However, according to Chipu (2011), most of these municipalities are struggling with the financial resources, expertise, and experience required to carry out this important responsibility. As a result, Rohman (2022) posits that PPPs have been identified as having a crucial role to play. This is important because the rationale for using PPPs is based on the need to leverage the strengths of both sectors, combining public sector resources and regulatory authority with private sector efficiency and innovation, and financial muscles (Republic of South Africa, 2004.).

In local government, it is assumed that PPPs have an important role to play, especially in mineral extraction areas such as Fetakgomo-Tubatse. However, a critical analysis of the integrated development plan of the municipality shows a bleak picture in terms of infrastructure development, especially the development of the road infrastructure. This is in spite of the fact that many mining companies operate in this area. These mining companies do not appear to be playing their role in helping the municipality

meet its road infrastructure development goals. In this context, the current study sought to investigate the role of mining companies, through PPP interventions, in the development of road infrastructure in mineral extraction areas such as Fetakgomo-Tubatse.

1.2. Problem statement

Public-private partnerships are considered a panacea for infrastructure development in many countries around the world, particularly where governments perceive the private sector as a viable partner towards infrastructure development (Sebitlo, Mbara, & Luke, 2022; Mandiriza & Fourie, 2022; Ruiters & Matji, 2016; Sesele & Marais, 2023; Akhavan & Golchin, 2021).). This is evident in that various countries have adopted PPP models to accelerate infrastructure development projects, to leverage private sector expertise, and to provide funding to supplement public resources (Akhavan & Golchin, 2021). This is consistent with the influences of the New Public Management (NPM) approach which was used as a popular template for organising the institutional architecture of most governments around the world (Donina & Paleari, 2019). At the heart of the NPM approach was the firm belief that private sector organisations are inherently efficient and effective compared to their counterparts in the public sector. For this reason, private sector orientations were adopted by public sector institutions in a quest to improve public service delivery. Furthermore, international experiences provide valuable information on the design, implementation, and results of PPPs, serving as benchmarks for the development of South Africa's municipal infrastructure (Akhavan & Golchin, 2021).

Similarly, South Africa's new democratic government did not escape the influence of NPM approaches. This is evident in that the country has also been persuaded by the logic that the involvement of private companies in infrastructure development can play a crucial role in the field. For this reason, the private sector is involved in the development of major infrastructure projects such as roads, water, health, education, transport, and information communication and technology (ICT) (Mital & Mital, 2016). In particular, PPPs have gained popularity in local government as a means to solve massive infrastructure backlogs and overcome budgetary restrictions (Akhavan & Golchin, 2021). National policy frameworks such as the National Development Plan (NDP) and the Municipal Infrastructure Grant (MIG) emphatically outline the important

role that private companies play in infrastructure development (National Treasury, 2017). Despite this, it is worth mentioning that mining companies in mineral extraction areas are often reluctant to participate in road infrastructure development programmes of municipalities within their areas of operation. The mining sector presents opportunities for collaboration between mining companies and local municipalities to develop shared infrastructure, such as roads, water supply, and social amenities (IDP Limpopo, 2020).

The massive challenges facing municipalities in South Africa in the development of road infrastructure are a major concern. In the case of the Fetakgomo-Tubatse local municipality (FTLM), the municipality still has inadequate roads and stormwater infrastructure. According to its integrated development plan (IDP) 2023/2024, two-thirds (68%) of municipal roads remain unpaved, with 53% being gravel roads and 15% only being earth trails. In addition, there is a large backlog of 362 access bridges from wards 1-39 (both low-level culverts and high-level) needed to create access between neighbouring villages, access to schools and access to cemeteries. In the FTLM vicinity, there are about 27 operational mines with 47 licences issued. However, the road infrastructure is massively underdeveloped. The state of affairs in FTLM begs the question, why is the municipality not collaborating with the mining companies to resolve the road infrastructure backlog? In this context, the study investigated the role and contribution of mining companies in the development of infrastructure development in mineral extraction areas such as local municipalities.

1.3. Research Questions

The general research question of the study is as follows: What role do mining companies play in the development of road infrastructure in Fetakgomo-Tubatse local municipality of Fetakgomo-Tubatse? From the general research question, the following specific research questions are formulated in the context of the study.

- How are mining companies, through their Social Labour Plans (SLPs), able to contribute to the road infrastructure?
- What are the factors that influence the participation of mining companies in the development of road infrastructure in Fetakgomo Tubatse local municipality?
- What are the challenges facing the mines and the Fetakgomo Tubatse municipality in implementing road infrastructure projects?

- What measures can be recommended to improve the role of mining companies in the development of road infrastructure in mineral extraction areas such as Fetakgomo Tubatse?

1.4. Research aims and objectives

The main objective of this study is to investigate the role and contribution of mining companies in the development of road infrastructure in mineral extraction areas with specific reference to selected mines within the Fetakgomo-Tubatse local municipality and to recommend strategies that could improve collaboration between mining companies and municipalities in mineral extraction areas. To achieve this objective, the current study emphasises the following objectives:

- To analyse how mining companies through their Social and Labour Plans contribute to the development of road infrastructure.
- To identify the factors that influence the participation of mining companies in the development of the road infrastructure in Fetakgomo-Tubatse Local Municipality.
- To identify challenges facing the mines and Fetakgomo-Tubatse municipality in executing road infrastructure development projects.
- To recommend strategies that could improve collaboration between mining companies and municipalities in mineral extraction areas.

1.5. Definition of key concepts

Infrastructure: 'Underground work or structure that serves as a support for another' and 'Set of elements, endowments or services necessary for the proper functioning of a country, a city, or any form of organisation' (Soto, 2023: 5). The American Heritage Dictionary (2022) defines it as both 'facilities' and as "An underlying foundation or foundation, especially for an organisation or system". According to Gómez-Ibaez and Meyer (2003) cited in Cantu (2017), infrastructure is a broad term that originates from the French root *infra*, meaning below, and the term *structure* which refers to an arrangement of and relations between the parts or elements of something complex. Infrastructure refers to the bottom of physical improvements and refers to public works (i.e., improvements and systems such as roads, bridges, airports, water supply and waste disposal). For the purpose of this study, infrastructure will be defined as the

essential organisational and physical structures and facilities required for a society, economy, or organisation to function. It includes all the infrastructure, roads, bridges, airports, and trains, utilities that keep a nation or community running smoothly. These include the internet, telecommunication networks, water supply, sewage systems, electricity, gas, and other vital services such as public safety, healthcare, and education.

The public sector: In general, all organisation and institutions that operate with the legislative framework of three spheres of government, namely: national, provincial, and local government spheres, are referred to as the public sector (Davids, Theron, & Maphunye, 2005). Its mandate is derived from the constitution as that of designing, developing, and implementing policies and programmes that are aimed at fulfilling the predetermined objectives of the broad government for socioeconomic development (Davids, Theron, & Maphunye, 2005). For the purpose of this study, the aforementioned definition will be adopted.

Value-for-money refers to the provision of services and the delivery of goods in which value is received for the funds injected. In other words, this denotes the combined whole life costs cycle, the completion schedule, risk management, and the quality of work, in order to meet public requirements (Nyagwachi, 2008). According to Binza (2009), value-for-money refers to the functions of the provision of the public sector entity carried out by a private entity, as stipulated in the PPP arrangement agreement, which should benefit the public sector entity.

Mineral extraction areas: Geographical regions designated as mineral extraction areas are those in which minerals, metals, or fossil fuels are extracted from the crust for industrial or commercial reasons (UNEP, 2016). To access and recover these precious resources, many extraction techniques are used in these places, including mines, quarries, and oil and gas fields (IISD, 2017). For the purpose of this study, the term Mineral extraction will be defined as areas where minerals are extracted from underground, these are places or areas that are rich in different minerals.

Social Labour Plans (SLPs) - Social and Labour Plans (SLPs) are strategic frameworks mandated by governments, particularly in the mining sector, to ensure that companies contribute to the socioeconomic development of the areas in which they operate (Adler, Claassen, Godfrey & Turton, 2007). SLPs are designed to promote

local economic growth, improve the living standards of employees and communities, and ensure sustainable development even after mining operations cease.

1.6. Outline of the study

The study is outlined as follows, chapter one, which consists of the general orientation of the study. Chapter two discusses the theoretical and conceptual framework, which consists of the theory and concepts that support the study. Chapter three discusses the role and contribution of mining companies in infrastructure development, in South Africa and other related countries. Chapter four explains the methodology of the study. Chapter five is the presentation, interpretation, and analysis of findings. Lastly, Chapter Six consists of the recommendations and conclusions of the study.

1.7. Conclusion

The chapter presented the introduction and the background of the study. The problem statement, the research objectives, and the research questions of the study were discussed. Then it highlighted the research methods that were used in pursuit of the study objective. The following chapter presents the theoretical and conceptual framework.in

CHAPTER 2: THEORETICAL AND CONCEPTUAL FRAMEWORK

2.1. Introduction

The previous chapter provided the contextual setting of the study, where the introduction and background of the study were explained. Furthermore, the problem that the study sought to address, the aim and objectives, as well as the research questions that guided the investigations were described. The purpose of this chapter is to provide a comprehensive and critical discussion of the theoretical and conceptual framework that undergirds this study. A theoretical and conceptual framework provide a solid foundation for research and explains the study's path. The two operate together to improve the overall significance of research findings, acceptability to the field's theoretical premises of the field, and generalisability. They provide research inquiry with both direction and drive, which help to stimulate research and ensure the spread of knowledge, thus improving the scientific rigour of a study. Therefore, Imenda (2014) asserts that a research project derives its life force from both its theoretical and conceptual foundation. Therefore, it makes sense that this important aspect of the investigation is clearly explained and justified. This is important given that it is often challenging for researchers and their readers to determine the academic perspective and the underlying elements behind the researcher's statements and/or hypotheses in research without a solid theoretical or conceptual base. In this context, a discussion of the theoretical and conceptual basis of a scientific inquiry becomes crucial at this stage of the current study.

2.2. The Evolution of Public Administration as a Discipline

Public Administration, as a discipline, has evolved over centuries, reflecting changes in societal complexity and governance requirements (Telsac, 2022). Here is an integrated exploration of the discipline's evolution through its key phases.

2.2.1. Early Foundations of Public Administration

The origins of Public Administration according to Telsac (2022) can be traced back to ancient societies such as Egypt, China, Greece and Rome, which established complex bureaucratic systems to manage state functions, including infrastructure, taxation and legal processes. In China, Confucian ideals emphasised governance based on meritocracy and moral leadership, particularly during the Han Dynasty (Fry & Raadschelders, 2013). Similarly, Rainey (2020) argued that the Roman Empire

maintained law and order across its vast territories through an advanced bureaucratic system. Although these early forms of administration laid the groundwork, public administration as a formal academic discipline gained popularity in the late 19th century, spurred by the rise of modern nation states, industrialisation, and urbanisation (Rainey, 2020).

2.2.2. Politics-Administration Dichotomy (1900-1926)

The formal establishment of Public Administration as an academic discipline is often attributed to Woodrow Wilson's seminal 1887 essay, '*The Study of Administration*'. (Telsac, 2022). Wilson argued for the separation of politics from administration, advocating for professional administrators to implement policies efficiently and without political interference. This concept, known as the politics-administration dichotomy, was foundational to the discipline's early development (Wilson, 1887; Rainey, 2020). During the Progressive Era in the United States (1890-1920), reforms were introduced aimed at reducing corruption and improving government efficiency. The Pendleton Civil Service Reform Act of 1883 highlighted the importance of merit-based hiring and the professionalisation of public service, solidifying public administration as a distinct field of study (Rosenbloom, 2014; Kettl, 2021).

A key element of the politics-administration dichotomy was the belief that separating political influence from administrative duties would lead to increased efficiency and effectiveness (Vyas-Doorgapersad & Shava, 2021). During this period, the generic administration paradigm emerged, promoting the application of scientific principles to management and administration in both the public and private sectors (Shaw, 2010). Since its inception, the politics-administration dichotomy has had a lasting impact on public administration in Africa, since the functioning of public institutions is often affected by the relationship between politicians and administrators (Demir & Nyhan, 2008; Shaw, 2010).). This paradigm not only shaped theory and instruction in public administration, but also introduced a scientific focus to the discipline by attempting to separate values from facts.

2.2.3. Principles of Administration (1927-1937)

The focus shifted toward refining administrative practices to ensure efficiency and scientific precision. During this phase, public administration evolved into a more scientific field, focussing on universal principles of administration (Rosenbloom,

Kravchuk & Clerkin, 2022). The early twentieth century saw significant expansion, with Max Weber's theory of bureaucracy gaining prominence. Weber's model, which emphasised hierarchical structures, clear rules, and impersonality, provided a framework for achieving efficiency, predictability, and rationality in governance (Weber, 1947; Raadschelders, 2020). Scholars like Luther Gulick and Lyndall Urwick contributed further by introducing concepts of scientific management and outlining management functions through the POSDCORB (Planning, Organising, Staffing, Directing, Coordinating, Reporting, and Budgeting) framework.

The emphasis on principles marked this period as an era focused on the identification and application of administrative principles. W.F. Willoughby's *Principles of Public Administration* (1927) signalled the beginning of this phase. Major works, including Mary Parker Follet's *Creative Experience*, Henry Fayol's *Industrial and General Management*, and Mooney and Reiley's *Principles of Organisation*, reinforced the scientific approach to administration (Mahavidyalaya, 2021). The publication of *Papers on the Science of Administration* by Gulick and Urwick in 1937 marked the peak of this era, promoting the idea that administration could be treated as a science. The POSDCORB framework provided a structured approach to management, reinforcing the belief that Public Administration could be studied and practised scientifically, with a focus on efficiency (Gulick, 1937; Denhardt & Denhardt, 2020).

2.2.4. The Era of Challenge (1938-1950)

This divergence in perspectives laid the foundation for a deeper exploration of administrative principles, as scholars began to focus on identifying universal rules and practices that could underpin effective governance. During this period, the academic discourse surrounding public administration experienced a notable shift. Although some scholars championed the idea that Public Administration was evolving into an independent discipline, distinct from Political Science, others remained steadfast in their opposition ((Dwivedi, 1978; Raadschelders, 1999; Henry, 2013). These critics (Wright, 2015; Dahl, 2018; Box, 1992) argued that public administration lacked the scientific rigour necessary to stand as a discipline in its own right, positioning it instead as a practical extension of political science (Kettl, 2015). This divergence in perspectives marked a critical juncture in the development of the field.

The principles-based approach, which had previously dominated public administration, faced substantial criticism. Scholars began to question its utility, highlighting its tendency to reduce administrative practices to overly formal and mechanical procedures. Herbert Simon's seminal critique of the so-called 'proverbs' of administration in 1946 was particularly influential. Simon (1946) argued that the reliance on generalised principles led to contradictions and failed to account for the complexities of real-world administrative behaviour. His work underscored the need for a more empirical and behaviour-informed approach to understanding administrative processes. This era of critique and re-assessment revealed the multifaceted nature of administration, which extends beyond procedural efficiency to encompass intricate social dynamics and human behaviours within organisations. As Thompson (2017) noted, this complexity required a broader analytical framework. Consequently, public administration began to draw extensively from the social sciences, incorporating insights from sociology, psychology, and organisational theory. This interdisciplinary approach marked a significant departure from the rigid application of principles, fostering a more holistic understanding of administrative phenomena.

This period of intellectual transformation not only expanded the methodological toolkit of public administration, but also laid the groundwork for its eventual recognition as a distinct and scientifically grounded field of study. Post-World War II, the distinction between politics and administration was re-evaluated in response to the growing complexity of government functions and the expansion of the welfare state (Wolffram, 2007). Scholars acknowledged that administrators played an active role in both policy formulation and execution, blurring the line between politics and administration (Waldo, 1948; Kettl, 2021). Comparative public administration also gained traction as researchers explored how political and administrative systems functioned in different countries (Pollitt & Bouckaert, 2017).

2.2.5. Identity Crisis (1956-1970)

During the mid-19th century, public administration underwent significant shifts, grappling with foundational questions about its identity, scope, and purpose. This period marked a transformative phase as scholars and practitioners alike sought to redefine the discipline (Kettl, 2021). The emergence of the New Public Administration (NPA) movement in the 1960s and 1970s was a direct response to the perceived

inadequacies of traditional public administration models. Rooted in technocratic and hierarchical principles, the earlier paradigms were critiqued for their rigidity and lack of responsiveness to the dynamic social and political landscape (Kettl, 2021).

The NPA movement introduced a paradigm shift, highlighting core values such as public service, social equity, and citizen accountability. Unlike its predecessor, which is the era of challenge and largely focused on efficiency and procedural correctness, the NPA championed a more participative and democratic approach. Scholars such as Frederick Mosher and Dwight Waldo played a pivotal role in advocating for this reorientation. Waldo, for instance, argued that public administration should not merely be about implementing policies but should also engage critically with broader societal goals, including the promotion of equity and justice (Waldo, 1968). Similarly, Mosher underscored the need for administrative systems to reflect democratic values and ensure inclusion in governance processes.

This intellectual movement catalysed a shift in the role of public administrators, positioning them as agents of social change. Instead of serving merely as neutral implementers of policy, they were encouraged to actively address social injustices and facilitate citizen participation in governance. The focus expanded beyond operational efficiency to encompass the role of public organisations in promoting human welfare. Policy analysis, citizen engagement, and ethical dimensions of governance gained prominence, reflecting a holistic understanding of the role of public administration in society (Denhardt & Denhardt, 2020; Kettl, 2021).

The NPA era thus marked a critical juncture in the evolution of public administration, embedding values of social justice and democratic responsiveness at its core. It laid the foundation for subsequent theoretical and practical developments, strengthening the discipline's commitment to address the complexities of modern governance in a socially responsible manner.

2.2.6. New Public Management (1970)

Attempts to re-establish Public Administration as an independent academic discipline led to a paradigm shift, moving away from traditional bureaucratic structures to more market-orientated approaches (Hood, 2020). The New Public Management (NPM) paradigm emphasised efficiency, market-based reforms, and the adoption of private sector management practices within the public sector. This represented a significant

shift from the conventional hierarchical model of public administration to more flexible, decentralised approaches (Osborne & Gaebler, 1992; Hood, 2020).

NPM led to a more policy-orientated discipline, focussing on public policymaking, implementation, and evaluation. The late twentieth and early twentieth centuries saw further changes driven by globalisation, technological advancements, and the rise of digital governance. Governments have increasingly adopted e-Governance to improve service delivery and transparency. Contemporary public administration is now influenced by concepts such as collaborative governance, network governance, and evidence-based policymaking, reflecting a shift toward inclusive, participatory, and data-driven governance (Mergel, 2016; Kooiman, 2003; Bryson, Crosby, & Bloomberg, 2014).

Under NPM, there was a growing recognition that governments alone could not address all public service and infrastructure needs effectively. This led to the development of public-private partnerships (PPPs), where the private sector plays a significant role in the delivery of public services traditionally managed by government agencies. In this context, the participation of mining companies in the development of road infrastructure is in line with the principles of NPM.

Mining companies, through Social and Labour Plans (SLPs), can contribute to road infrastructure as part of their corporate social responsibility (CSR) obligations and legal requirements. This collaboration exemplifies NPM's emphasis on leveraging private sector efficiency, resources, and expertise to address public needs. By engaging private entities, such as mining companies, in public infrastructure projects, governments can reduce costs, improve service quality, and accelerate development processes. The NPM approach encourages such collaborations, seeing them as a means to improve the efficiency and effectiveness of public service delivery.

Furthermore, the focus on mining companies' role on infrastructure reflects NPM's broader goals of decentralisation and local-level governance. It allows for more localised and context-specific solutions to infrastructure challenges, as companies operating within particular communities can directly contribute to addressing those communities' specific needs. This approach is consistent with the ideals of flexibility, responsiveness, and outcome-orientated governance of the NPM, where the goal is

to achieve tangible improvements in public service delivery, such as better road infrastructure, through strategic partnerships.

2.2.7. New Public Governance (1990)

The limitations of Classical Public Administration (CPA) and NPM systems have led to the emergence of the new public governance paradigm (NPG). According to Osborne (2010), NPG is better equipped to handle the complexities of a globalised, networked society. Unlike its predecessors, NPG emphasises citizen-centric governance, where the primary focus is on serving the public while fostering collaboration among various stakeholders, including corporations, nonprofits, and government agencies (Ansell & Gash, 2008).

NPG advocates networked interactions, promoting horizontal, rather than hierarchical, collaboration. It supports decision-making processes that involve all stakeholders, leading to more transparent, inclusive, and adaptive governance structures. By prioritising outcomes over processes, NPG encourages flexibility and responsiveness, enabling public administration to address complex social issues through collaboration across the public, private and non-profit sectors (Sørensen & Torfing, 2007; Xu, Sun & Si, 2015).

2.3. Theoretical framework

A theoretical framework consists of the different theories put forth by scholars and professionals in the field of study under which research is carried out (Kivunja, 2018). But public administration is an eclectic science in that it does not have a theory of its own. What are the implications of this when mapping out a theoretical framework?

A theoretical framework is normally used as a lens through the researcher looks at data, analyses and interprets it (Kivunja, 2018). To put it another way, a theoretical framework is a structure that condenses ideas and hypotheses that a researcher develops from evidence that has already been tested and published, which they then synthesise to provide a theoretical background or foundation for their data analysis and interpretation (Kivunja, 2018). Flowing from this context, a theoretical framework can be understood as a plan or outline and a research strategy and typically comes before the literature review. By allowing the researcher to explicitly explain the lenses through which the research issue is being investigated, a theoretical framework basically aids in establishing the researcher's grounding in both the subject and the

field in which the research is being conducted. This study adopted the stakeholder theory, this theory was adopted based on its relevance to this study, and more discussion about its strength, relevance follows below.

2.3.1. Stakeholder Theory

There has been a close relationship between stakeholder theory and strategy. To organise data that was becoming increasingly crucial for strategic planning, Eric Rhenman in Sweden and the Stanford Research Institute established the stakeholder concept (Freeman, Harrison, Wicks, Parmar & De Colle, 2010). Its inception and initial development were intended to increase the effectiveness of corporate strategy and policy (Freeman, Phillips, & Sisodia, 2020). The idea that companies exist to maximise profit for shareholders is what defines this ostensibly limited viewpoint of the company. Similarly, proponents of stakeholder theory such as (Jensen, 2010 & Gibson, 2000) also see profitability as a key goal. However, they do not necessarily believe that shareholders' interests are more significant than those of other stakeholders.

The foundation of stakeholder theory is the influence of important players operating either inside or outside of an organisation (Mandiriza & Fourie, 2023). As a result, stakeholders are representatives, either directly or indirectly, who have interests in a project or a business. The success or failure of the planned enterprise may be directly related to the material or legal claim. The government's regulatory bodies, which serve as gatekeepers, might also be considered stakeholders (Nwangu, 2019; Wgrzyn & Wojewnik-Filipkowska, 2022). Stakeholders in the context of municipal PPPs in South Africa comprise those stakeholders involved in the creation of policies (national government), their implementation (local governments), and service delivery (private sector organisations); What about community members? (Benton, 2013; Nwangu, 2019). Political parties (represented in councils), special interest lobbyists, locals, corporate representatives, and labour unions are other pertinent stakeholders. The main objective of PPP agreements is to deliver agreed-upon projects while encouraging private and public collaboration and sharing the related risks and benefits.

Stakeholder theory is an organisational and management theory that contends that when making choices, organisations should consider the interests and welfare of all parties involved, not just shareholders, as shareholder theory suggests. According to

Freeman *et al.* (2020), organisations have obligations to other people or groups in addition to shareholders when it comes to the decisions and actions the company takes. Employees, clients, suppliers, communities, government bodies, and other parties with an interest in the company can all be considered stakeholders.

There are several key principles and concepts associated with stakeholder theory. These principles can be known as the following: stakeholder identification analysis, stakeholder engagement, stakeholder management, and stakeholder value creation (Freeman *et al.*, 2010). The process entails the identification of main stakeholders, who are directly impacted by the activities of the business, as well as secondary stakeholders, who are impacted indirectly (Freeman *et al.*, 2010). According to stakeholder theory, meaningful interactions with stakeholders are crucial. This might involve talking to them about their issues, asking for their opinion, and including them in the decision-making process.

Effective stakeholder relationship management is essential for organisations to maintain long-term success by balancing conflicting interests (Freeman *et al.*, 2010). Establishing mutually beneficial connections, resolving disagreements, and prioritising stakeholders are some examples of what this entails. According to stakeholder theory, a company can survive sustainably in the long run by adding value to its stakeholders. The theory guides that organisations can foster innovation, improve their reputation and foster trust by taking into account the interests of all stakeholders.

Figure 1 shows the vertical relationships among partners in a PPP structure.

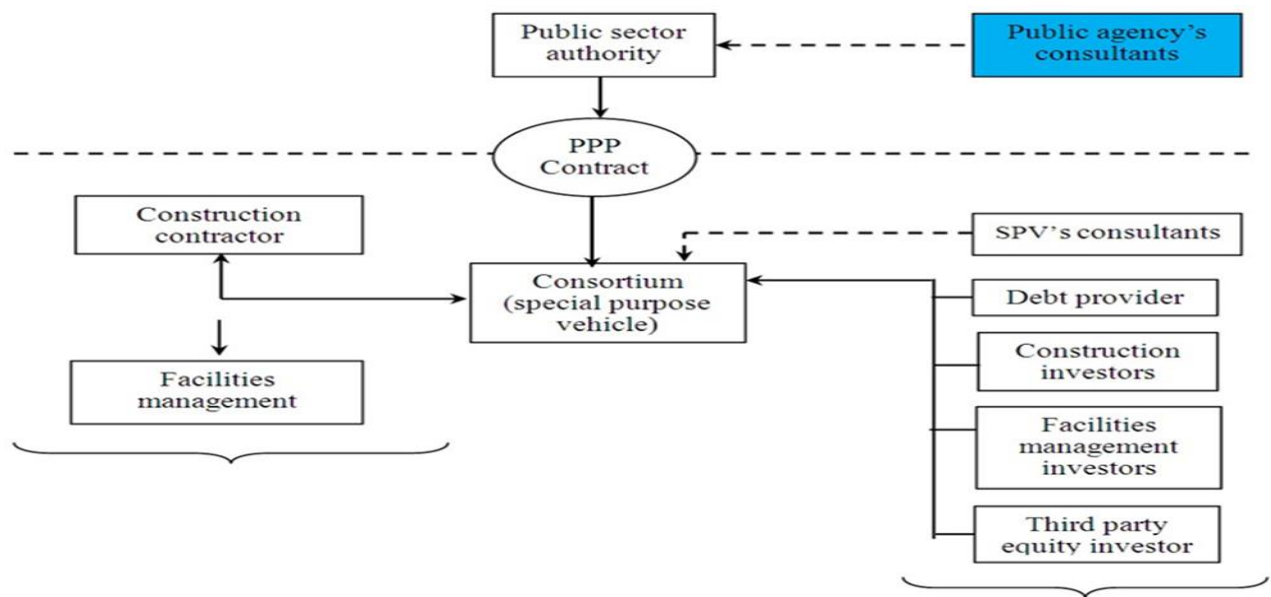


Figure 1 Vertical linkages in an illustrative PPP structure.

Source: Adapted from (Mandiriza and Fourie, 2023)

An enforceable contract governs an interorganisational agreement among stakeholders (Sumo, van der Valk, Duysters, & van Weele, 2016), which is essentially what a PPP structure looks like. Opara and Rouse (2019) posit that each stakeholder's rights and obligations are laid out in detail, together with the expected results, and are represented in a performance-based contract.

Stakeholder theory promotes responsibility and accountability to all parties involved in a project. This refers to making sure that the general objectives of infrastructure development and municipal growth are in line with the interests of both public and private partners in the context of PPPs. It also involves making sure that risks are appropriately handled and that rewards are allocated to all parties equally. Effective management of stakeholder relationships is crucial, according to stakeholder theory. Collaboration between public and private entities is a requirement of PPP projects, and good stakeholder relations are crucial to the project's success. This involves responding to issues, settling disputes, and ensuring accountability and openness throughout the course of the project.

2.4. Conceptual Framework

According to Camp (2001), a conceptual framework is a structure that the researcher feels best explains the way the topic under study has evolved naturally. It is connected to the ideas, concepts, and empirical studies that are used to systematise and advance the knowledge that the researcher espouses (Adom, Hussein & Adu-Agyem, 2018). It is an explanation given by the researcher answering the question of how the research topic will be investigated. According to Adom *et al.* (2018), the conceptual framework offers an integrated perspective on an issue that is being studied. From a statistical point of view, the conceptual framework explains how key concepts of a study relate to each other. The conceptual framework is put together logically to help illustrate how concepts in research relate to one another visually (Grant & Osanloo, 2014). It is interesting since it illustrates the steps the researcher plans to take in a research study (Dixon, Gulliver, & Gibbon, 2001). The framework facilitates the researcher's ability to clearly describe and clarify the ideas within the study's topic (Luse, Mennecke & Townsend, 2012). Conceptual frameworks can be graphical or in a narrative form showing the key variables or constructs to be studied and the presumed relationships between them.

2.4.1. Infrastructure Development

Essential organisational and physical structures and facilities required for a society or business to function are referred to as infrastructure (World Bank, 2022). It includes all the assets and processes that keep a community, economy, or organisation running smoothly. These include public institutions, waste management, energy facilities, water supply, transportation networks, and communication systems. According to the OECD (2020), quality of life, social advancement, and economic growth are all made possible by infrastructure. It makes it easier for people, things, and information to move around and offers the necessary services. Societies are more resilient, productive, and competitive when they have a well-maintained infrastructure.

Infrastructure provision is essential to promote rapid economic growth. Mohammad (2010) discovered that the increase in production was facilitated by advances in the fundamental infrastructure. Canning and Pedroni (2008) note that while there are significant national differences, infrastructure unquestionably has a long-term role in economic growth. It is acknowledged that the costs associated with building new infrastructure positively correlate with advancement and productivity, despite the

complex relationship between infrastructure and economic growth (Fay, Toman, Benitez & Csordas, 2011). Despite the many advantages of investing in infrastructure, there is a severe lack of financing for new infrastructure worldwide (Asian Development Bank, 2009).

Socioeconomic growth and reduction of poverty depend on functional infrastructure and an effective built environment (Perkins, 2011). Numerous official government documents highlight this, such as the National Development Plan (NDP) (NPC 2012), the Diagnostic Report (NPC 2011), the Medium-Term Expenditure Framework (SA Treasury 2017), and the National Development Plan (National Planning Commission 2012). To achieve South Africa's long-term economic and social objectives, infrastructure development is essential. According to the National Infrastructure Plan (NIP 2050), the public sector should take the lead in this endeavour when it comes to a developing nation looking to make major structural changes. Infrastructure provision will be one of the key factors in South Africa's transformation from a historically closed mineral economy to one that is inclusive, low carbon, internationally, and regionally linked, and fosters dynamism in the country's future sectors.

2.4.2. Road Infrastructure

Physical elements of roads, highways, streets, bridges, tunnels, and associated constructions are included in the category of road infrastructure, together with any auxiliary systems such as traffic signals, signs, and toll booths (World Bank, 2019). It serves as the foundation of transportation networks, allowing the flow of people and goods both within and between geographical areas. Strong development and maintenance are essential for overall quality of life, social connections, and economic progress (World Bank, 2019).

South Africa's road infrastructure is an essential part of the nation's transportation system, promoting social cohesion, trade, and economic activity (RSA, 2012). As a concept, it includes an extensive system of roads, highways, bridges and tunnels that connect metropolitan areas, rural villages, and industrial zones in the varied terrain of the country. Building and maintaining road infrastructure is essential to facilitate the smooth flow of people and products, encourage travel, and strengthen regional connectivity.

Historically, South Africa has made great efforts to develop and expand its road infrastructure, especially after the end of apartheid in 1994. The government has made significant investments in infrastructure projects to improve connectivity across the nation, alleviate historical disparities, and spur economic growth (Department of Transportation, 2020). The financing and execution of road infrastructure projects have been greatly aided by significant programmes such as the Expanded Public Works Programme (EPWP) and Strategic Infrastructure Projects (SIP).

According to the 2030 National Development Plan (NDP), the national road network is managed, maintained and developed by the government organisation known as the South African National Roads Agency Limited (SANRAL). About 22,214 kilometres of national highways are under the control of SANRAL; they make up 20% of the whole road network but transport over 80% of the nation's freight and roughly 40% of its passenger traffic.

2.4.2.1. Components of Road Infrastructure

- **Roads and highways:** These are the main roads for cars, which go from small town streets to major interstate highways (American Society of Civil Engineers, 2021). They are usually made up of many layers, such as the sub-base layer, the base layer, and the road surface, and are made to endure different loads and weather conditions.
- **Bridges and tunnels:** These constructions allow roadways to pass through obstacles such as mountains, valleys, and rivers. There are several types of bridges, such as suspension, cable-stayed, beam, and arch bridges, each of which is appropriate for a certain span and kind of terrain (International Road federation, 2020). Tunnel boring machines (TBMs) or excavation techniques are used to create tunnels that allow passage through solid impediments.
- **Interchanges and Junctions:** These are the intersections where traffic flows can merge or change direction. To maximise traffic flow and reduce congestion, interchanges can be configured as roundabouts, cloverleaf, or diamonds (IRF, 2020).
- **Traffic Management Systems:** These include devices that control vehicle movements and guarantee road safety, such as traffic lights, signs, signals, and electronic toll collecting systems (Transportation Research Board, 2021). Intelligent transportation systems (ITS), one example of an advanced

technology, combine data analytics and sensors to improve traffic flow and give drivers real-time information (TRB, 2021).

2.4.3. Public-Private Partnerships

The term "public-private partnership" (PPP) is not universally understood (World Bank, 2016). In general, PPP refers to agreements, usually medium to long term, between the public and private sectors wherein part of the services that come within the purview of the government are provided by the private sector, according to the World Bank (2016). The obligations of each party and the distribution of risk are spelt out in the signed contract. Moreover, a PPP suggests that the private sector would work with the government on a project. The duration of the agreement between the host nation and the private investor is typically between ten and thirty years, after which the government may seize the asset from the investors (Seader, 2004). Additionally, the private investor can negotiate with the government to continue managing the asset. In this situation, the government or local authority has the only right to determine whether to keep its ties to the same business. "PPP is a relationship or collaboration built on the expertise of each partner that meets clearly defined public needs through the appropriate allocation: Resources, Risks, Responsibilities, and Rewards," according to another definition provided by Asian Infrastructure in partnership with the UN (2011:8). The phrases public-private partnership and privatisation are frequently used synonymously in numerous literary works. But the contradiction between the two is crucial. The government still maintains authority over the resources that the private sector manages under PPPs. Conversely, the selling of public assets to the private sector is referred to as privatisation; Put differently, public-private partnerships (PPPs) give the government power over the private sector.

Since each party involved brings something significant to the project, ideally, PPPs give all stakeholders equal negotiating power. While the public partner supplies property and assigns the authority to offer public services to the private party on its behalf, the private partners contribute money and expertise. This kind of pooling of resources facilitates the sharing of obligations and risks. Depending on the needs of the project, national laws, and public policy, PPPs come in a variety of types. Users pay a charge to the concessioner (private partner) for using the facility under concession agreements, which are mostly based on the BOT (Build Operate-Transfer) model. The toll tax for road and bridge infrastructure is a notable example of such

payments. Concession agreements and franchise are terms that are occasionally used interchangeably. But since a franchise excludes the transfer of ownership to the public sector, it is not a true PPP.

2.4.4. Municipal Service Partnerships

An option available to South African local governments to provide services to their residents is the municipal service partnership (MSP). The use of MSPs is often seen as a government tactic to deliberately transfer service delivery duties to the private sector at the cost of public organisations. MSPs are designed to deliver municipal services in a creative and strategic manner, not to replace outdated and conventional methods (White paper, 2004). However, they should be seen as only one option to improve the quality of service delivery within the borders of several municipalities across the country. They are seen to be somewhat more effective and efficient than municipalities. According to a white paper (2004), MSPs are designed to give governments cutting-edge solutions for resolving service delivery backlogs in different localities. However, Mamabolo (2013) contends that, rather than being viewed as clever and creative means of providing services efficiently, MSPs are instead perceived as a conduit for corruption.

The effectiveness of service delivery can be increased by performing MSP agreements correctly. Consequently, increased efficiency allows for the provision of high-quality services at the expense of the local council budget. However, MSPs also help towns reduce the cost of leasing, renting and obtaining technological licences. The local government sector will eventually be able to spend less on capital expenses to expand its infrastructure and advance its technological capabilities.

2.4.4.1. The Importance of Municipal Service Partnerships

Municipalities may obtain essential services from the private sector using the MSP, which is an essential instrument. Styen and Van Heerden (2011) assert that municipalities may overcome their challenges with service delivery with the assistance of the private sector. They continue by saying that it would be wise to look into short- or medium-term local public-private partnership contracts as a way to get around the problems. Ruiters and Matji (2016) state that due to South Africa's severe backlog in service delivery and limited access to essential services, the government has had to

come up with novel ways to deal with problems related to service delivery, one of which is municipal service partnerships.

To achieve the goals of the Reconstruction and Development Programme (RDP) within a reasonable timeframe, municipalities are required to investigate novel approaches to the provision of municipal services, as stated in The White Paper on Municipal Service Partnerships (2004). Innovative methods of providing services led to the formation of municipal service partnerships. Some of the importance of MSPs in South African municipalities are listed below.

- **Accessibility of services** According to Keluh (2021), one tool or mechanism that municipalities use to achieve the right to appropriate municipal services is municipal service partnerships (MSPs). The purpose of MSPs is to ensure that every community has access to a minimal set of services. According to Keluh (2021), the foundation of municipal-private sector collaboration is a constitutional need, rather than an objective. Both new infrastructure development and the renovation and repair of current infrastructure are necessary to overcome the severe disparities in service access that now persist.
- **Accountability for services:** As stated by the South African Local Government Association (2020), MSPs must be accountable. Public Mamokhere, Musitha, and Netshidzivhani (2021) state that accountability is a means of fostering local democracy through participation. To assist in providing high-quality municipal services, the government has adopted laws to ensure that all significant local players and stakeholders fulfil their respective tasks and responsibilities. Public accountability is still a catchphrase and is undoubtedly not taken seriously, especially by municipal officials, despite these actions and policies.
The importance of accountability is well demonstrated by recent nationwide public protest marches against inadequate service delivery (Mamokhere, 2021). This responsibility is contingent upon a number of factors, including information accessibility, a certain degree of transparency, and the availability of sanctions of some kind. Because of this, it can be said that MSPs require a framework that emphasises accountability, transparency, understanding of risk-sharing procedures, and the integration of social, environmental, and economic

processes (SALGA, 2020). Clearly, MSPs are the main forces behind responsible governance, as they guarantee shared risks and require the service provider to answer to the municipality in its capacity as an employer. Municipalities also represent people living under their authority. The capacity to succeed in the future is largely dependent on the responsibility of all important participants and stakeholders in the local governance system.

- **Sustainability of services:** Although it is legally required for all governments to offer efficient and sustainable services, it is not always easy to do this (Bekink, 2006). The MSP was established as a constitutional mandate for all municipal governments, and it was designed to ensure that services to local communities are delivered sustainably. Given this core obligation, providing services is an ongoing endeavour. However, the provision of ongoing services depends on how municipal organisations are run financially and administratively.

2.4.5. New Public Management (NPM)

New public management (NPM) is becoming widely accepted by governments and international organisations as a paradigm or framework for reorganising public sector governance and strengthening the government's ties to the mechanisms in civil society and government that determine how well the government runs its operations (Borole, 2022). The Traditional Public Administration was redesigned, modernised, and replaced with the NPM system in the 1980s.

According to Lapuente and Van de Walle (2020), it is difficult to define the concept of New Public Management. This is because its initial ideological or, at the very least, sentimental foundation was the belief that the governmental sectors, particularly in Western democracies, had grown excessively vast and ineffective. Young, Wiley, and Searing (2020:482) define NPM as a theory that “assume(s) competitive relationships between independent service units within any public policy domain, taking place within a horizontally organised marketplace and where the key governance mechanism is some combination of competition, the price mechanism, and contractual relationships”. NPM suggests marketisation as a means of fostering competition, either through internal markets within the government or by outsourcing to the private sector. This contrasts with traditional public administrations that provide public services uniformly.

South Africa joined the OECD as a member in 1994. In South Africa, the theory of NPM and its implementation gained traction immediately after the inauguration of the new democracy in 1994 and 1995, finding expression in policy frameworks. The "young" independent South African government was tasked with reviving the socioeconomic system through long-term and democratic measures.

2.4.6. Post- New Public Management

The emergence of New Public Management (NPM) theory in the later part of the twentieth century drastically changed public administration (Christensen, 2012). In the provision of public services, NPM placed a strong emphasis on efficiency, accountability, and market-based methods. But when NPM's drawbacks and unexpected implications became clear, researchers and professionals started looking into other frameworks (Kinder, 2012). As a result, the post-new public management theory (PNPM) was developed, with the aim of rectifying the inadequacies of NPM while incorporating fresh perspectives from other fields.

A shift away from NPM's market-centric perspective and toward a more comprehensive and cooperative approach to public governance may be seen in NPM theory. Serving the needs and interests of residents is given more weight under NPM than just achieving efficiency and cost-effectiveness (Colyvas & Powell, 2006). The objective is to involve individuals in the decision-making process while acknowledging the diversity of beliefs and interests throughout society. In contrast to NPM's hierarchical and fragmented structures, NPM places a strong emphasis on the value of partnerships and cooperation across the public, corporate, and nonprofit sectors (De Vries & Nemec, 2013). Moreover, it encourages networked methods to problem-solving and service delivery and acknowledges the interconnectedness of enterprises. In public decision-making processes, NPM promotes greater accountability, openness, and participation (Bouckaert, 2004). It aims to strengthen democratic institutions and public accountability systems for public servants. NPM highlights the importance of organisational learning and adaptation while acknowledging the complexity and unpredictability that are inherent in the public sector. Lastly, it promotes trial and error, creativity, and ongoing improvement in the provision of public services.

2.4.7. Corporate Social Responsibility

Corporate Social Responsibility (CSR) focusses on accountability and transparency of corporate actions that include social, ethical, environmental, and economic efforts, which are often voluntary and placed both inside and outside of market and commercial transactions (Ismail, 2009). Corporate social responsibility is the responsibility of for-profit and non-profit organisations for their impact on stakeholders, the natural environment, and wider society. The World Business Council for Sustainable Development defines corporate social responsibility (WBCSD, 2000) defines corporate social responsibility thus: “Continuous commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce, their families, as well as of the local community and society at large” is how. Furthermore, corporate social responsibility is seen by the Organisation for Economic Cooperation and Development (OECD) as the “Business contribution to sustainable development”. As a result, corporate behaviour must address societal and environmental issues and values in addition to ensuring profits to shareholders, salaries to employees, and goods and services for customers (OECD, 2001:13). Lastly, CSR is defined by OECD (2002) as voluntary company behaviour that goes above and beyond legal obligations. Businesses must include the effects on the environment, society, and economy in their operations. CSR is an integral part of how businesses are run, not an optional “add-on” to their main operations.

CSR is business's ongoing commitment to act morally, promote economic growth, and enhance the lives of employees and their families, as well as the local community and society at large (Ismail, 2009). This suggests that corporate social responsibility involves incorporating social, environmental, and economic factors into company decision-making frameworks and procedures. It involves applying innovation to solve social and environmental problems in novel and valuable ways. Additionally, it entails involving shareholders and other stakeholders and working together with them to handle risks more skilfully while also establishing credibility and confidence in the community. Therefore, from the definitions and descriptions, it can be stated that corporate social responsibility (CSR) is an approach whereby a business takes into account the interests of all stakeholders, both inside and outside the organisation, and applies those interests while developing its strategy and during execution, according to Nolan, Norton, and Co. (2009), cited in Ali, Rehman, Yilmaz, Nazir and Ali (2010).

Corporate social responsibility provides businesses with several ways to save money while simultaneously setting themselves from rivals.

2.5. Conclusion

The chapter discussed the theories that inform public-private partnerships as a way that mines can help in road infrastructure improvement in mineral extraction areas. It discussed the theory adopted in the study, i.e., stakeholder theory. The concepts that inform the study, which are related to infrastructure development and municipal service partnerships, were also discussed in the chapter. The next chapter discusses road infrastructure in mineral extraction areas.

CHAPTER 3: ROAD INFRASTRUCTURE DEVELOPMENT IN MINERAL EXTRACTION AREAS – LITERATURE REVIEW

3.1. Introduction

The previous chapter explained the theories that guide the study, which (theoretical framework) and the key concepts that support the undertaken study (Conceptual framework). The current chapter discusses the development of mining companies and the road infrastructure. It first discusses the concept of road infrastructure development in general and in a South African context. Then it discusses the road infrastructure development in South Africa. The historical impact of mining companies is also discussed, and case studies of successful road infrastructure projects that had been implemented by mining companies in the communities in which they are situated in. Lastly, the chapter discusses the state of the road infrastructure in some of the mineral extraction areas.

3.2. Road Infrastructure

One of the main pillars that support international connections, and economic growth is road infrastructure. Efficient road networks are crucial for trade, tourism, and the general well-being of society, since they facilitate the mobility of people and the transit of goods (World Economic Forum, 2020). Road infrastructure is more important than just being connected. By providing access to markets, opportunities for education, healthcare and employment, it promotes social progress and economic prosperity (World Bank, 2020). Furthermore, efficient road networks increase industry competitiveness by reducing transportation costs and improving supply chain logistics.

Despite the fact that road infrastructure is essential, its development and administration face common trends and issues in most African countries. Rapid urbanisation is putting increasing strain on road networks, leading to traffic jams and environmental degradation (World Road Association, 2013). The emergence of disruptive technology, such as autonomous driving, electric vehicles and smart transportation networks, has also changed the way road infrastructure is built. But along with these developments, according to Salling and Banister (2009), climate change presents a serious hazard in the form of extreme weather events that can damage roads and interfere with transportation networks.

Regional differences in road infrastructure are significant and are influenced by a variety of variables, including location, economic standing, and political policy (World Bank, 2020). While most affluent countries have large, well-kept road networks, their developing-nation counterparts sometimes struggle with inadequate infrastructure and budgetary restrictions. The development and maintenance of road infrastructure require large investments, which are frequently provided by a variety of stakeholders, including governments, international organisations, and businesses in the private sector companies. Road improvements are usually financed through the use of public-private partnerships (PPPs), grants, loans, and tolls.

As demonstrated by its alignment with multiple Sustainable Development Goals (SDGs), including Goal 9 (Industry, Innovation, and Infrastructure) and goal 11 (Sustainable Cities and Communities), road infrastructure and sustainable development are inextricably linked (World Road Association, 2013). Sustainable road development is an integrated strategy for infrastructure development that aims to reduce the impact on the environment, improve safety, and promote inclusive growth.

Several nations have made significant investments in this field after realising how important road infrastructure is to foster economic growth. To improve connection among its member states, the European Union, for example, has launched large-scale projects such as the Trans-European Transport Networks (TEN-T) programme (World Bank, 2020). Similarly, China's Belt and Road Initiative (BRI) consists of large-scale road projects designed to promote connectivity between Europe, Asia, and Africa to facilitate trade and economic cooperation. Initiatives such as the African Union's Programme for Infrastructure Development in Africa (PIDA) aim to address these issues by making targeted investments in transportation infrastructure. Inadequate road infrastructure in Africa poses major barriers to economic development and regional integration (African Union Commission, 2012).

3.2.1 Road infrastructure in South Africa

South Africa's Road infrastructure is an essential component of the country's transportation system, enabling trade, social mobility, and regional connectivity (Department of Transportation, 2019). Even with significant progress made over the years, there are still recurring challenges, including maintenance delays, traffic congestion, and financial constraints. According to Hirsch (2018), the road network in

South Africa has a long history dating back to the colonial era, when it was largely built to support economic needs, such as mining and agriculture. Furthermore, the construction of roads infrastructure was prioritised by the apartheid system in order to maintain spatial segregation and control mobility (Hirsch, 2018).

The South African National Roads Agency Limited (SANRAL) is responsible for overseeing the administration of the vast national road network, which includes key arterial thoroughfares connecting important economic centres and international border points (SANRAL, 2022). These highways play a crucial role in promoting business and trade both within the country and with other countries. Decades of insufficient funding and poor maintenance have created a backlog in road improvements and maintenance, leading to deteriorating road conditions and longer travel times (DoT, 2019).

Rapid population growth and urbanisation in cities like Johannesburg, Cape Town, and Durban have made key roads more congested, which has an adverse effect on the standard of living and productivity of the local population (National Treasury, 2020). The rapid development and maintenance of road infrastructure has been hindered by the lack of public funds allocated for infrastructure projects, which is exacerbated by conflicting budgetary demands (National Treasury, 2020). As part of its plan for economic growth, the South African government has prioritised infrastructure construction in recent decades. Road expansions and renovations are among the infrastructure deficiencies addressed by policies such as the National Development Plan (NDP) and Strategic Infrastructure Projects (SIP).

South Africa has adopted Public-Private Partnerships (PPPs) for the financing and administration of road initiatives more and more in order to increase public finance and speed infrastructure delivery (World Bank, 2021). These cooperative efforts comprise synergistic interaction between public and private sector organisations, utilising assets and knowledge to support service delivery and operational effectiveness. The trajectory of South Africa's Road infrastructure predicts further improvement and growth despite current obstacles (DoT, 2019). Modern technologies such as intelligent transportation systems (ITS) and tolling systems have the potential to improve the effectiveness and safety of the road network. Furthermore, initiatives to align

transportation planning with more comprehensive urban development plans can help reduce traffic and promote sustainable mobility paradigms (National Treasury, 2019).

The road system in the province of Limpopo, especially in the Fetakgomo-Tubatse Local Municipality, is characterised by a complex landscape influenced by a range of elements such as topography, socioeconomic conditions and development objectives. The road network connects metropolitan areas, rural areas, and economic hubs and is a vital channel for transportation. But, as in many other parts of South Africa, there are still issues with maintenance, growth, and fair resource sharing.

Situated in the Sekhukhune District of the Province of Limpopo, the Fetakgomo-Tubatse Local Municipality spans a variety of topography, from developed regions to rural villages. Due to the geographical variety, both urban and rural people require a complete transportation infrastructure. Major routes such as R37 and R555 are essential to promote connectivity inside the municipality (SANRAL, 2022). For example, the R37 is an essential route that connects the municipality to neighbouring provinces, while the R555 links important commercial hubs in Limpopo. In addition to facilitating interprovincial mobility, these arterial roads promote regional integration and economic growth.

However, maintaining and growing the road network still presents difficulties, especially in rural regions (National Treasury, 2019). Inadequate financing, insufficient resources, and conflicting agendas frequently impede attempts to rectify infrastructure shortcomings. Since many of the rural villages still struggle with accessibility issues, socioeconomic growth is hampered and inequality is exacerbated (World Bank, 2020). Both governmental and nongovernmental organisations have made concentrated efforts in recent years to address these issues. The objectives of programmes such as the Provincial Roads Maintenance Grant are to advance socioeconomic development, increase road safety, and maintain the state of the roads. Furthermore, the implementation of customised solutions and the improvement of community engagement in infrastructure development have been made possible through collaborations with stakeholders from the business sector and community-based groups.

3.3 Overview of the development of municipal road infrastructure

One of the most important components of raising the standards of living is road infrastructure. Therefore, infrastructure development is essential to generating employment possibilities and lowering the rising rate of poverty in rural areas. But because their economies do not grow as quickly as those of rich nations, the majority of emerging nations are having issues with infrastructure development (Nyawo & Mashau, 2019).

It has been determined that inadequate road infrastructure contributes to decreased investment, tourism, and corporate profitability (Johansson, 2004; Sebola, 2014; Duranton, 2015). In South Africa, the development of road infrastructure has been a top priority. Inappropriate road infrastructure is a key contributor to traffic accidents, low economic productivity in regions of concern, and a risk to the long-term viability of taxis and other forms of transportation. An additional significant issue with South Africa's road infrastructure, according to Mamabolo (2016), is the unequal distribution of services. The government's strategy, which requires formerly advantaged communities to share resources with formerly disadvantaged municipalities, is blamed for creating this inequality.

According to the South African Institution of Civil Engineering (SAICE), infrastructure report card for South Africa (2011), there is a lack of coordination and responsibility, and municipal roads are poorly managed. The research goes on to say that gravel roads are in poor to extremely poor condition, while concrete roads are in quite decent shape (*ibid.*). This implies that the issue of local roads is neglected in terms of road provision, as gravel roads are found in most local regions.

An effective and efficient transportation infrastructure facilitates access to markets, employment prospects, and investment opportunities, claims Mofomme (2019). In South Africa, road transportation plays a significant role in the economy as it facilitates the movement of goods and services between individuals and between nations. People need transportation to get to work, school, and to convey raw materials to the market after manufacturing; therefore, transportation is important in all spheres of society, including the workplace. Because of this, a developing nation like South Africa needs effective and efficient road networks to get from one place to another. According to Nyawo and Mashau (2019), rural road infrastructure is a vital resource for people

living in rural communities. However, in South Africa, these networks are in worse shape and appear to be ignored by the government. Because farmers cannot bring their fresh food to the commercial markets, South Africa's rural economy suffers greatly from its mainly gravel roads in rural areas, which are also poorly maintained.

3.4. Mining and Road Infrastructure Development: A Global Perspective

Mining companies around the world play a key role in building and improving road infrastructure, particularly in areas where government investment is limited (Brereton & Parmenter, 2008). According to Jang and Topal (2020) in Australia, for example, major mining corporations such as Rio Tinto and BHP have taken the lead in constructing roads in remote regions. These roads are crucial for transporting minerals, but they also benefit local communities by improving access to essential services and economic opportunities (Brereton & Parmenter, 2008; Ivanova, Rolfe, Lockie & Timmer 2007). This relationship between mining and infrastructure development demonstrates how industry-driven projects can contribute to broader regional growth.

In Canada, mining companies are often required to invest in local infrastructure as part of their licensing agreements. Firms like Barrick Gold and Teck Resources have played a significant role in funding road projects, particularly in remote and Indigenous communities where government resources are scarce (Söderholm & Svahn, 2015; Mining Association of Canada, 2020). While these projects are beneficial, ensuring that they are sustainable and truly meet the needs of local populations remains a challenge (Prno & Slocombe, 2012).

Across Africa, particularly in Ghana and Zambia, mining companies typically contribute to road infrastructure through Corporate Social Investment (CSI) programs. However, studies indicate that these efforts often fall short of expectations due to weak regulatory oversight (Osei-Kojo & Andrews, 2020). For instance, in Ghana, companies like Newmont and AngloGold Ashanti have built and maintained roads in mining communities (Acheampong et al., 2016). Yet, without strong enforcement of quality standards, these roads frequently deteriorate, leaving communities with unreliable infrastructure (Campbell, 2009). Similarly, in Zambia, firms such as First Quantum Minerals have made investments in road networks, but concerns remain about the

unequal distribution of benefits, with some communities seeing little improvement despite significant mining revenues (Lungu & Mulenga, 2005).

Globally, the extent to which mining companies contribute to road infrastructure is influenced by regulatory policies, corporate responsibility commitments, and the practical need for efficient transportation networks. While these investments bring essential infrastructure to many regions, their long-term impact depends on clear policies, transparent project implementation, and meaningful community involvement (Bebbington et al., 2008). Strengthening accountability and fostering partnerships between mining firms, governments, and local stakeholders can help ensure that mining-related road developments are both equitable and sustainable.

3.5. Historical context: Impact of mining on South African communities

In South Africa, the mining industry is essential to both local and national development. In the past, mining has been essential to South Africa's economic growth. Mining has been a major force behind the US economy for at least half a century (Crankshaw, 2002). The sixth largest contribution to the GDP overall is the mining industry. The mining industry is still considered the main driver of employment and the backbone of the economy today (The Africa's Mineral Industry SAMI – DMR 2010/2011 Report). Mining increased its contribution to GDP by R17.9 billion from the previous year to R230.4 billion (\$31.5 billion) or 9.6% in 2010 (Xongo, 2013).

The mining industry's performance in 2010 showed a notable comeback from the previous collapse caused by the world financial and economic crises. In this sense, compared to a decline in the previous year, the total extraction rate increased by an astounding 5.8%. According to the DMR report, the performance indicates that the next commodities boom has officially started, and that recovery is now well under way. In 2009, women's employment increased by an astounding 11% during the same year that the mining industry had a 5.1% decline in employment. Women's employment in the industry began at a low level, suggesting that efforts to diversify the workforce are starting to pay off.

Women's employment increased by 15.6% in 2010 compared to a 1.2% increase in overall employment. The total number of jobs in the mining industry was 498,055, well shy of the half million mark. According to the DMR 2010-11 Annual Report, given the present interventions, mining employment grew in 2010 and will continue to do so in

the future. These are intended to set this sector of the economy on a path of sustainable growth that will continue to produce respectable jobs in line with the goals of national development goals. Among these innovations is the creation of the Beneficiation Strategy, the updated Mining Charter, and a national mining sector plan (DMR 2010/11).

Christian and Rogerson (2011) state that some studies have been done on active mines in South Africa and their effects on livelihoods and local people. One of the most important criteria for mining companies is the development of the mining community (Christian & Rogerson, 2011). The Social and Labour Plan requires that mining firms contribute significantly to community development, both in terms of size and impact, according to the social license to operate, according to the DME Guideline of the Social and Labour Plan (2008) DME. The development of communities, labour-sending regions, and any recognised areas of need in a sustainable way is the main goal of the development of mining communities. The Mine or Production Operation should collaborate with the areas in which it operates and the labour-sending areas in the creation and evaluation of the Integrated Development Plan. In terms of development, it must guarantee engagement with the communities where the operation is conducted, as well as with significant labour-sending locations.

The mine or production operation is required to submit a plan after consulting with the appropriate authorities and communities. The plan should be in accordance with the labour sending area, the integrated development plan, and any other area that may be in need. Any additional project that the applicant finds that is not included in the IDP may be added, and the project will be included in the IDP (Social and Labour Plan Guideline, 2008/2010). For most municipalities, the IDPs present a real opportunity for integrated development initiatives and coordinated development. The importance of IDPs in uniting a variety of development concerns, objectives, stakeholders, and programmes has been emphasised. Additionally, IDPs provide a crucial foundation for developing local economies that are sustainable (Rogerson, 2011). According to Marais and Atkinson (2006), the mining industry must pay attention to the IDPs that have been drafted. In the future, mines that have not yet participated in the IDP preparing procedure should be fixed. It is obvious that all parties involved in the IDP process must treat it seriously. Because IDP manages development challenges from

the perspective of the surrounding people, the government and authorities rather than from that of the mining industry, it is crucial that mining firms take it seriously.

IDPs can be used as a useful lens to see possibilities and challenges in a community, according to Marais (2011). In order to help the mines aim their social interventions as successfully as possible, this provides a way of understanding how the mining sector is perceived and experienced by the larger society. According to Marais and Atkinson (2006), “the preparation of IDPs is probably the most accurate contemporary record of how local leaders and local residents view mining issues”. Additionally, as IDPs are recognised as legally enforceable instruments for increased local collaboration, partnerships with national or provincial ministries include negotiating such programmes through the appropriate municipality via the IDP channel.

3.6. The evolving role of mining companies

Mining as a development activity invests significantly in local communities where such activities are taking place (Ngobese, 2015). Ideally, the investment takes the form of capacity building for workers and infrastructure setup in the form of public schools, health clinics, water supply systems as well as transport infrastructure. There is also an expectation by government and local communities that mining companies will uplift the entrepreneurial activities present in the locality by providing opportunities to supply materials and related commodities and services to mining companies, miners, and their families (World Bank, 2005).

According to Holden (2007), mining companies are also expected to provide employment opportunities to communities in their vicinity directly during the construction and operation phases of their processes and indirectly through the demand of goods and services from the miners. This process creates a cycle of revenue generation and the circulation of currency, which is expected to improve the quality of life of those who live in mining communities. Furthermore, the sector also earns much needed foreign exchange and other tax revenues from the government, all of which contribute significantly to the country’s balance of payments and gross domestic product.

While the ideal scenario is an active mining sector that contributes to the socio-economic development of local communities, the literature reveals varying success across the globe. This is largely because public participation in the processes of

development is non-existent or very minimal. Davis and Tilton (2012) argue that sustainable mining activities are directly proportionate to the level of participation of the public in those activities. The authors emphasised that the community, the government and owners of mining companies should engage with each other constantly and genuinely to effectively sustain mining activities in the areas (see Davis & Tilton, 2012). While this is true in developed countries, it is not so in developing countries (Malinganya, Simon & Paul, 2013). In Ghana, for example, since the inception of the country's economic policy changes in 1983, the mining sector has flourished considerably, but communities adjacent to the mining company have not enjoyed the benefits of this economic prosperity (*ibid.*). Similar cases have been documented in Tanzania, with the cause being limited resources and with a weak institutional capacity to deal with the socio-economic implications of mining activities in local communities. Local communities have been excluded from policy discussions on the development of mineral resources.

In South Africa, the case has been similar. Empirical evidence provided by researchers suggests that while the government has a sufficient legislative framework to guide the mining sector in its work, the sector's awareness of local communities is poor (Saul & Bond, 2014). The literature indicates that most local communities adjacent to the mining companies are inadequately supplied with public goods and services such as schools, health clinics, roads, poor housing, clean water systems, and functional sanitation infrastructure (Malinganya *et al.*, 2013, Eggert, 2001; Mbilima, 2021). The situation has overtime resulted in civil protests and aggravated the relationship between the government, local communities, and mining companies (Bond, 2004). The rise in unemployment rates in mining communities has compounded the problem.

3.7. Case Studies: Successful Road Infrastructure Projects

Case study 1: Sishen Mine

3.7.1. Construction of a Road (Klein Neira to Churchill)

The Joe Morolong Local Municipality situated in Churchill in the Northern Cape Province identified a need for the upgrading of a main gravel road between the village of Lotlhakaneng and Klein Neira. The services required include the following: The development of a new main road consisting of a double seal wearing course, for the Municipality; preparations of business plans, project costs estimate, as well as

preparation of tender documents, budget control, monthly progress reports and overall implementation (Sishen SLP, 2020). The identified road is the main road leaving Lotlhakaneng going to Klein Neira in a south-western direction. The project generated more than 20 jobs.

3.7.2. Case Study 2: Infrastructure and poverty eradication projects by Dwarsrivier mine 2016-2020

No.	General (e.g. education)	Specific (e.g. building of school)	Type of Need (infrastructure)	Extent of delivery	Municipality	Area
01.	Water	Provision of portable water	Infrastructure (Basic service)	350 households	SDM and FTLM	Ntshwaneng
02.	Electrification	Provision of Electricity	Infrastructure (Basic Service)	300 households	FTLM	Ga-Rantho
03.	Access roads	Provision of access roads	Infrastructure (Basic Service)	Steelbridge (Joint project of the mines).	FTLM	Ga-Malekane
04.	Educational Infrastructure	Construct a 3 block of three classrooms, 56 m2 each. Construct staff room, Procure furniture for all classrooms	Infrastructure	777 beneficiaries	FTLM	Ga-Masha

SLP (2020) retrieved from:

<https://www.assore.com/wp-content/uploads/2019/08/Revised-SLP2-23-July-2018.pdf> accessed on 20 May 2024

3.7.3. Case Study 3: Anglo American Kumba Iron Ore Road Projects

Anglo American, a leading global mining company, has made significant contributions to infrastructure development in South Africa through its subsidiary, Kumba Iron Ore. Kumba iron ore road projects are part of its broader commitment to community development and corporate social responsibility.

3.7.3.1. Kathu Road Upgrades

Kathu is a town in the Northern Cape Province of South Africa, near the Kumba Sishen mine. The mine operations have significant impacts on the local infrastructure due to heavy vehicle traffic. Kumba Iron Ore has invested in upgrading the main roads in and around Kathu to support the increased traffic load and improve safety. This includes widening roads, strengthening road surfaces, and improving drainage systems to cope with heavy rainfall. These improvements have improved road safety and reduced travel times for both commercial and private vehicles. They also support the local economy by facilitating smoother transport of goods and services.

3.7.3.2. R31 Road Rehabilitation

The R31 road is a critical transport route in the Northern Cape, connecting the mining towns of Kathu and Kuruman. Due to the high volume of heavy mining trucks, the road has suffered significant wear and tear. Kumba Iron Ore, in partnership with local government authorities, has undertaken rehabilitation projects on the R31. This includes resurfacing the road, repairing potholes, and enhancing road signs and signage. Rehabilitation of the R31 has significantly improved the safety and efficiency of this major transport route, benefiting not only the mining operations but also the local communities that rely on this road for daily travel.

3.7.4. Case Study 5: Assmang's Khumani Mine Road Development Case Study

The Assmang Khumani Mine, located in the Northern Cape Province of South Africa, is a significant iron ore mining operation. The development of the Khumani Mine Road was crucial to improving the logistics and transportation, which directly impacts the mine's efficiency and output of the mine. The case study conducted by the Chamber of mines (2011) on the Khumani Mine Road development illustrates the project's planning, execution, and outcomes, highlighting key aspects such as infrastructure development, economic impact, and environmental considerations.

The Khumani Mine Road was developed to address the transportation needs of iron ore from the mine to the Sishen-Saldanha railway line. The development of the road involved constructing a new road and the upgrade of existing infrastructure to support heavy vehicles transporting ore. This infrastructure improvement was essential to reduce transportation costs and improve mine operational efficiency (Engineering News, 2012). The project required significant investment and collaboration between

various stakeholders, including Assmang, local government authorities, and contractors. The development included the building of new bridges, improving the road surface, and ensuring the road have the capacity and density to handle the high volume and weight of trucks used in ore transportation (BKS (Pty) Ltd, 2011).

The development of the Khumani Mine Road had a substantial economic impact on the region. It facilitated smoother and more efficient transportation of iron ore, directly contributing to the productivity of the mine. Improved logistics, therefore, meant faster turnaround times for ore deliveries, which helped Assmang to meet its export goals more effectively (Chamber of Mines Council, 2011). In addition, road development created employment opportunities during the construction phase and contributed to the local economy by employing local contractors and suppliers. This influx of economic activity had positive ripple effects on the surrounding communities (Northern Cape Provincial Government, 2011).

Although road development brought economic benefits, it also required careful environmental planning and management. The project had to comply with environmental regulations to mitigate the impact on the local ecosystem. Measures were taken to minimise dust and noise pollution during construction and to protect local wildlife habitats (South African Environmental Affairs Department, 2011). As such, an environmental impact assessment (EIA) was conducted to ensure that the project would not have long-term detrimental effects on the environment. This assessment included evaluating the possible impacts on soil, water resources, and biodiversity and developing strategies to mitigate these impacts (Golder Associates, 2011).

3.8. State of road infrastructure in mineral extraction areas

Famous for having an abundance of mineral resources, South Africa's economy is highly dependent on these resources. Mineral resources contribute about 7.56% of the GDP (National Treasury, 2021). However, the condition of the road network in mineral extraction regions is still a major obstacle (National Treasury, 2017). The road network in South Africa is vast, spanning over 750,000 kilometres, of which 19% are paved. Municipal roads are often in worse condition than national and provincial roads, which are managed by the South African National Roads Agency Limited (SANRAL) and the provincial governments, respectively (SANRAL, 2022). Even with such a vast

network, there are significant regional differences in road infrastructure, especially in mineral-rich and rural and mineral-rich areas.

The mining industry in South Africa is highly dependent on mineral extraction regions including the Northwest, Limpopo and Mpumalanga (National Treasury, 2017). Unfortunately, the road system in these areas. Road degradation is worsened by the heavy traffic of mining trucks, which causes substantial wear and tear (Department of Transportation, 2019). For example, it is commonly claimed that the roads in the coal mining districts of Mpumalanga and the platinum belt of Limpopo are in bad shape (DoT, 2020).

3.8.1. Emalahleni Local Municipality (ELM) Mpumalanga

The South African province of Mpumalanga has, as one of its regions, the important industrial and mining hub Emalahleni Local Municipality (IDP, 2023). Transportation of products, services, and the general public puts a significant demand on the road infrastructure due to its economic function. However, a number of issues that affect the use and safety have made the road system in Emalahleni a source of concern (DOT, 2020).

The national, provincial, and municipal roads are all mixed together to form the road network in Emalahleni (SANRAL, 2022). These roads vary greatly in condition. Provincial and municipal roads are often in poorer shape than national highways, which are managed by the South African National Roads Agency Limited (SANRAL). Long-distance travel as well as the movement of coal from the area's mines to power plants and other locations depend heavily on these main routes.

However, the municipal roads in this region have a lot of problems as far as quality infrastructure is concerned. The Emalahleni Local Municipality (2023) reported that several local roads are in poor condition. Some roads are almost completely inaccessible due to potholes, erosion, and poor maintenance. Heavy traffic, especially heavy-duty vehicles connected to mining and industrial operations, aggravates this degradation.

3.8.2. Rustenburg Local Municipality (RLM) Northwest

The overall length of the Rustenburg Road network is 1,911.732 km, of which 859.134 km are gravel (unpaved) and 1340 km are tarred (paved) (SANRAL, 2022). Provincial and national roads are not included in the distance from the road network. The

municipality is creating master plans for storm water and highways, which will serve as a roadmap for the growth and development of the aforementioned infrastructure (RLM IDP 2022/2027). The surface characteristics of most paved roads range from good to medium, suggesting that these roads were in reasonable condition. The gravel quality and quantity varied from acceptable to bad, suggesting that the roads were in poor condition.

Thus, it was discovered that there was a significant requirement for re-gravelling. It was discovered that roads with low profiles lacked camber, which caused the water to pool. The average visual gravel index (VGI) for RLM unpaved roads was determined to be 41%, according to the Visual Condition Assessment, which suggested that most roads were in bad condition (RLM IDP 2022/2027). The road network appeared to be in acceptable condition according to the average Visual Condition Index (VCI) and the Reseal Condition Index (RCI) for paved roads, which were determined to be 69% and 61%, respectively.

The RLM is made up of rural residential areas, agricultural land, and mining areas. Rustenburg is surrounded by a concentrated urban development, with the Magalies Mountains to the south of the city and mining land and related residential districts to the northeast of the city. The need for housing, retail projects, and support services all of which require office space increased as a result of the area's increased mining activities (RLM IDP 2022/2027). The road network, which is already working at capacity in certain places, is further burdened by the additional journeys these new projects create on it. Moreover, most of the transportation of mining goods inside and beyond the RLM occurs on the road.

3.8.3. Northern cape Province

The Northern Cape, as a key mineral extraction region in South Africa, faces significant challenges in road infrastructure despite its economic importance. The province's roads are critical for transporting minerals like iron ore, manganese, and diamonds to ports and processing facilities, yet many routes are poorly maintained, hindering efficient logistics. For instance, the Northern Cape Department of Roads and Public Works has acknowledged the backlog in maintenance and the strain placed on infrastructure by heavy mining vehicles (Mokwena, 2020). Additionally, private sector investments in road development have been limited, despite the dependence of mining

operations on reliable transport networks (Kumar, Ndlovu & Phiri, 2022). The situation underscores the need for enhanced public-private partnerships to address infrastructure gaps and support sustainable development in the region.

3.8.4. Limpopo province

Limpopo, one of the nine provinces of South Africa, is rich in mineral resources, including platinum, chromite, coal and iron ore. The mining sector contributes significantly to the provincial and national economy. However, the state of the road infrastructure in Limpopo is critical for effective extraction and transport of these minerals. Limpopo's road infrastructure comprises a mix of national, provincial, and municipal roads. Despite recent improvements, several challenges remain.

Many roads in Limpopo are in poor condition due to inadequate maintenance, which affects transportation efficiency. Heavy trucks carrying minerals often exacerbate road deterioration (Mokonyama & Tlolane, 2019). The Road Management Systems (RMS) report from the Limpopo Department of Public Works, Roads, and Infrastructure indicates that approximately 60% of provincial roads are in fair to poor condition, necessitating urgent rehabilitation (LDPWRI, 2021). Poor road conditions increase vehicle operating costs, travel time, and accident rates, thus impacting the profitability of mining operations. Effective transport infrastructure is crucial to minimise the costs associated with the transport of minerals to markets and ports (Department of Economic Development, 2020).

The South African government, recognising these issues, has initiated several infrastructure projects aimed at upgrading and expanding the road network. The Strategic Infrastructure Project (SIP) 1 and SIP 5, part of the National Development Plan, focus on improving logistics corridors and integrating mining regions with export hubs (National Planning Commission, 2019). Public-private partnerships are also being explored to enhance infrastructure development. Mining companies such as Anglo-American Platinum have invested in road projects to ensure efficient transport for their operations (Anglo American, 2022).

Limited financial resources hinder extensive infrastructure projects. Although national and provincial budgets allocate funds for road maintenance, these are often insufficient given the scale of deterioration (Treasury, 2022). Instances of corruption and mismanagement of funds further hinder progress. The Auditor-General's reports

highlight significant irregularities in public spending on road infrastructure (Auditor-General South Africa, 2021).

The road infrastructure in Limpopo, crucial for its mineral extraction activities, faces significant challenges. Although there are ongoing efforts to improve the situation, the effectiveness of these initiatives depends on adequate funding, effective management, and continuous maintenance. Enhancing the road infrastructure will not only benefit the mining sector but will also contribute to the overall economic development of the province.

3.9. Conclusion

The chapter discussed the state of road infrastructure in mineral extraction areas. A few case studies were highlighted, also a few mineral extraction areas were also discussed. The following chapter is going to discuss thoroughly the research methodology that was utilised in the study.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

4.1. Introduction

The previous chapter discussed the presentation of literature review on the development of road infrastructure in mineral extraction areas. The objective of this chapter is to provide an overview of the research methods used in this research study. To this end, the research paradigm and methods used are comprehensively discussed in this chapter. Furthermore, the methods and procedures that were followed in the planning, collection of data, analysis, interpretation and reporting of outcomes. To address the research questions and objectives, the chapter then examines the justification for the methodology used as well as the study design and methodologies that were used.

4.2. Research Paradigm

A paradigm is a “philosophical and theoretical framework of a scientific school or discipline within theories, laws, and generalisations and the experiments performed in support of them” (Merriam 2007: 464). The paradigm is a method of understanding and doing things, to put it simply. It includes the four primary foundations of ontology, epistemology, methodology, and techniques.

The Oxford dictionary defines ontology as referring to the “philosophy concerned with the nature of being” (South African Pocket Oxford Dictionary, 2001: 624). It is also understood as referring to the philosophical stance informing the methodology, and as such, it provides context for the process and grounding its logic and criteria. Denzin and Lincoln (1998: 201) define ontology as a way of constructing reality, in terms of “how things really are’ and ‘how things really work”. Ontology is, therefore, the study of being. Within the context of ontology, Creswell (1994: 4) argues that “the only reality is that constructed by the individuals involved in the research situation”. Therefore, there are multiple realities in any given situation. In simpler and more practical terms, ontology refers to the way of constructing and attaching meaning to situations so that they can be interpreted as sensible.

To this end, the American philosopher Kuhn (1974) posits that there are several philosophies that researchers can use to inform their investigations. These include positivism/post-positivism, realism, pragmatism, and interpretivism.

4.2.1. Positivism

Positivism ensures that there is a clear and accurate knowledge of the world. It is about something that is posited, it is about something that is given (Al-Ababneh, 2020). Positivism is interested in developing a comprehensive social system for which research methods can be applied to the study of society and humans, so that they benefit. Positive science is based on real experience, not speculation. In this science, all knowledge is rooted firmly and solely in a hypothesis that has yet to be speculatively proven. The Positivist philosophy adopts the philosophical stance of the natural scientist, and the results of this research philosophy can be law-like generalisations, similar to the results obtained by physical and natural scientists (Saunders *et al.*, 2009) in (Al-Ababneh, 2020). Positivism holds that scientific discoveries and technology are the driving forces of progress and that scientific knowledge is accurate and certain. This is the belief in science. Positivism is purely objective. From the positivist point of view, objects in the world have meaning prior to and independent of consciousness about them. Furthermore, a distinction must be maintained between objective, empirically verifiable knowledge and subjective, unverifiable knowledge. In positivist philosophy, researchers treat problems objectively without affecting the actual problems under study. A positivist philosophy therefore requires a very well-structured methodology, quantifiable observations, and statistical analysis (Remenyi, Williams, Money & Swartz, 2005). As a result, positivism assumes that researchers conduct objective analyses and interpretations of the data collected (Saunders, 2009). This philosophy was not suitable for this study because, as expressed by Damoah (2015), positivism produces quantitative data, it generalises from samples to population, and lastly it is concerned with hypothesis testing.

Positivism is not suitable for this study because positivism frequently employs quantitative techniques and is centred on observable, objective facts. However, positivism may not adequately reflect the depth and complexity required in this research study, as it addresses complex social phenomena (such as emotions, perceptions, or cultural norms) that call for an understanding of subjective experiences.

4.2.2. Post-Positivism

Post-positivism developed as a response to and evolution of positivism, a paradigm that emphasised the scientific study of human behaviour. Positivism treats humans as

subjects for scientific inquiry, often simplifying complex social phenomena into measurable data. Babbie (2020) argues that this objectification not only reduces the human experience but also presumes that all social issues can be addressed through scientific reasoning. In contrast, Creswell (2011) explains that post-positivism acknowledges the existence of multiple realities and integrates both qualitative and quantitative methods to explore phenomena. This approach allows researchers to use various data collection techniques, such as in-depth interviews and structured surveys, to gather comprehensive information. By employing a mixed-methods approach, post-positivism provides a more nuanced and complete understanding of social phenomena. Denzin and Lincoln (2011) further note that post - positivism encourages flexibility, recognising that research may evolve during the study process and that even with appropriate methods, definitive results cannot always be guaranteed.

In general, post-positivism emphasises testing hypotheses, objective measurement, and generalisation. Its goal is to use statistical analysis and methodical observation to uncover universal truths. However, it is likely that examining the role and contributions of mining companies in the development of road infrastructure will be a focus of the discussion on the role of these companies in the development of road infrastructure. Post-positivism might not adequately capture the processes, viewpoints, and experiences of stakeholders that the research may need to comprehend in addition to the results.

4.2.3. Realism

Realism is another research philosophy related to scientific research. Realist philosophy is based on the belief that reality exists in the world and that reality is independent of people's thoughts and beliefs. According to Al-Ababneh (2020), realism is opposed to idealism because the existence of reality is independent. Realism is a type of epistemology and thus it is similar to positivism, which assumes a scientific approach to the development of knowledge.

4.2.4. Pragmatism

Pragmatism holds that reality exists in the world, and it supports the objective nature of science. In addition, this philosophy assumes that individuality can affect how people view the world and that research is therefore subjective (Joseph, 2020). This philosophical view gives many interpretations to science. This philosophy uses both

objective and subjective criteria (Saunders, Lewis & Thornhill, 2003). Therefore, pragmatic philosophy lies between positivist and interpretive philosophy, it refers to the absence of a correct philosophy, and therefore researchers can apply more than one research philosophy. Pragmatism claims that it is possible to work with epistemological variants (Saunders *et al.*, 2009).

4.2.4. Interpretivism

Phenomenology (or Interpretivism) is another theoretical perspective that has emerged in contrast to positivism to understand and explain human and social reality (Al-Ababneh, 2020). Interpretive approaches seek culturally derived and historically contextual interpretations of the social environment (Al-Ababneh, 2020). The positivist approach, on the other hand, follows the methods of the natural sciences through perhaps worthless and distant observation to identify the universal features of humanity, society, and history that offer explanation and thus predictability and control. This philosophy sees the social world of economics and management as too complex to be treated as a physical science. This is because complex management research is lost to the social world when its complexity is reduced to generalisations like law. The interpretive philosophy assumes that each company's situation is unique and different from others. This methodology is not suitable for generalisation due to changing circumstances of business organisations, different interpretations by people, and the complexity and uniqueness of the world (Saunders *et al.*, 2009). This interpretive philosophy develops knowledge differently, focussing on subjective and descriptive ways of dealing with complex situations rather than objective and statistical ones (Remenyi *et al.*, 2005). Social research is complex and cannot be theorised on the basis of clear laws like another scientific research. The complexity of the social sciences, social research requires research behind law-like generalisations, and the philosophy of this research is Interpretivist (Saunders *et al.*, 2009).

Upon reviewing the philosophical literature, it became apparent to the researcher that the process of selecting a research methodology, namely, the way research is conducted, extends beyond practical considerations. Rather, it involves a philosophical resolution to the fundamental question of why research is necessary for the purposes of a scholarly investigation. The guiding tenets of the interpretivist philosophies were influential. The interpretive paradigm upholds the significance of acquiring and using data in the pursuit of knowledge (Muhammad, 2014). The use of

the interpretivism paradigm is justified for this research because it emphasises understanding the subjective meanings, perceptions, and actions of various stakeholders involved in the development of the road infrastructure by mining companies, focusing on how these interactions shape local social realities within the local municipality of Fetakgomo-Tubatse.

4.3. Research Design

Maree (2007) and Bryman (2016) define research design as a plan, framework, or strategy that starts with an underlying philosophical assumption and specifies how respondents will be chosen, what data will be gathered, and how it will be analysed. It is the strategy that directs how the circumstances for data collection and analysis are arranged, with the goal of combining relevance to the study goal. This view is further supported by De Vaus (2001:9), who asserts that “a research design is more than simply a work plan” in that “the function of a research design is to ensure that the evidence obtained enables us to answer the initial question as unambiguously as possible”. It is critical to choose an appropriate design based on the research problem and the subject matter expertise of the study in order to properly address the research questions and achieve the study objectives. To put it more simply, research design is any overarching strategy, technique, plan, or procedure that the researcher decides to use to carry out the study in a way that makes sense and is pertinent to addressing the research question(s).

This offers detailed steps on how each phase of the research project will go, including theories applied, data collecting, management, and analysis, and presentation of findings, among other things. The questions to be answered and the research problem define the type of research design. Research design is essentially concerned with the structure of the study. There are several types of research designs, according to Bryman (2016). These include quasi - experimental designs, cross-sectional or survey designs, longitudinal designs, case study designs, and comparative designs. Since the research questions in this study are related to the experiences, views, and facts of the participants, a case study research design which falls under the Interpretivism research paradigm was used. A case study research design is explained in 4.3.4.

4.3.1 Narrative Research

Narrative research is an investigative approach from the humanities in which researchers examine the lives of individuals and ask them to tell stories about their lives (Riessman, 2008). The information is then organised by researchers and retold in a narrative chronology. Ultimately, the narrative often combines perspectives from the life of the participant and the life of the researcher in a collaborative narrative (Clandinin & Connelly, 2000). The stories are retold by researchers using structural means such as plot, setting, activity, climax and resolution.

4.3.2 Phenomenological research

Phenomenological research is a research design from philosophy and psychology in which the researcher describes individuals' life experiences of a phenomenon described by the participants. It is a qualitative strategy in which the researcher determines the nature of the human experience of a phenomenon as described by the study participants (Creswell, 2014). This description culminates in the experiences of several individuals who have experienced the phenomenon. It uses the analysis of meaningful utterances, generates units of meaning, and develops the description of nature. This concept is based on strong philosophical foundations and often involves conducting interviews (Giorgi, 2009).

4.3.3. Grounded Theory

Grounded theory is a concept of sociological research in which the researcher derives a general abstract theory of a process, action, or interaction based on the perspectives of the participants. This process involves the use of several stages of data collection as well as refinement and associations between types of information (Charmaz, 2006). Grounded theory has systematic steps that include creating categories of information, choosing one of the categories, positioning it in the theoretical model, and then interpreting a story from the relationship between these categories. It is an exploratory method that allows the researcher to develop theoretical stories based on concepts, categories, and prepositions. It is used to develop a theoretical framework to conceptualise organisational problems around the adoption and use of innovations and applications (Jabar *et al.*, 2009). Jabar went on to explain that the main drawback of this method is its sensitivity to the rigour and skill of researchers in interpreting the data, which makes it unfavourable to researchers.

4.3.4. Case study

According to De Vaus (2001:2), “whether the research question is descriptive, or explanatory has a fundamental impact on the way researchers develop research designs”. While descriptive research is concerned with the “what” issue, explanatory research concentrates on the “why” question. According to Babbie and Mouton (2001:80), a “descriptive research design” is one that entails a detailed description of an individual, event, or group”. “Case studies merely describe what occurred, but they cannot tell us why it occurred,” contend Marczyk, DeMatteo, and Festinger (2005:149). Due to this, “the research design must maximise reliability and make adequate provision for protection against bias” in this type of study (Kothari, 2004:37). As a result, in order for the case study technique to be successful in research, the researcher must make sure that bias is removed, and dependability is increased by making sure that the researcher adheres to the research ethics. The study used Fetakgomo Tubatse Local Municipality, as the case study for this investigation.

4.4. Research Approach

The research approach, according to Jonkowicz (2000) and Kothari (2004:8), is the framework or design used to systematically identify solutions to the research problem. It contains the procedures and actions the researcher will follow in order to examine the research topic (Ponterotto, 2005). The research technique is simply a planned and methodical approach to performing research. A variety of approaches, such as adopting a qualitative or quantitative methodological attitude, might be used. It is critically significant to remember that research methodologies and research methodology are two separate things. A research method is the practice of research in terms of strategies and techniques, whereas methodology refers to the philosophy or general principles behind research, as stated clearly by (Xaba, 2020). The methodology pertains to the approach utilised in conducting a scientific investigation. The research community is aware of three types of research methodologies: mixed, qualitative, and quantitative. These approaches are discussed in the following.

4.4.1. Quantitative Research Methodology

The quantitative research approach is sometimes known as “the traditional, the positivist, the experimental, or the empiricist paradigm,” according to Xaba (2020:114). He goes on to say that this paradigm offers a “numerical or quantitative description of some fraction of the population”. The quantity or amount, which is usually stated in

absolute numbers or shown statistically, is disclosed to the researcher by quantitative measurement. In order to explain, forecast or confirm phenomena, the quantitative research approach seeks to understand the link between two or more measured variables. The findings are displayed numerically. Quantitative methods aim to classify features, count them and create statistical models to test hypotheses and explain observations. Findings from quantitative data can be generalised. Data sets are large, and findings are representative of a population. Documentation on the research framework and methods can be shared and replicated. Standardised approaches allow the study to be replicated over time (Goertzen, 2017).

Like other methods, quantitative data are not without flaws. The previous discussion that quantitative research relies primarily on the assumptions of positivist approach to science is supported by Xaba (2020). This suggests that they consistently used the unit analysis of casual relationships between variables in relation to the hypothesis of the study. The drawbacks of quantitative technique are summarised by Goertzen (2017: 13) as follows: “Data do not provide evidence for why populations think, feel, or act in certain ways”. Reaching some demographic groups may be challenging, especially those that are vulnerable or disadvantaged. Research can take a lot of time and need to gather data over an extended period of time. Quantitative data is linked to quantitative research because it is recorded and examined using statistical methods. On the contrary, qualitative research is mostly dependent on human interpretation and judgment and definitions of terms, concepts, and variables, as well as their connections.

4.4.2. Qualitative Research Methodology

The qualitative paradigm is also referred to as constructivists approach or naturalistic, interpretative approach, the post-positive or postmodern perspective, according to Creswell (1994). Creswell (1994) also posits that the qualitative research technique distinguishes between qualitative and quantitative research based on a number of assumptions. These presumptions are related to methodology, significance, key tools, and descriptive and inductive field work. To put it simply, the qualitative research approach provides written, visual, or object-based descriptions and analyses of a study subject. The qualitative approach is different from the quantitative technique in

that it acknowledges that the purpose of science is to find the truth about the world and apply the scientific method to develop a more comprehensive understanding of reality.

The qualitative research method is used to answer questions about the complex nature of the phenomenon mainly with the purpose of describing and understanding the variable from the experiences, opinion, and point of view (Xaba, 2020). Consequently, a qualitative research study acknowledges that pertinent reality (with regard to human experience) is a subjective experience inside a particular social context and historical era. The goal of qualitative research technique is to learn as much as possible about people's ideas and feelings about their circumstances without passing judgment on whether such sentiments and thoughts are legitimate.

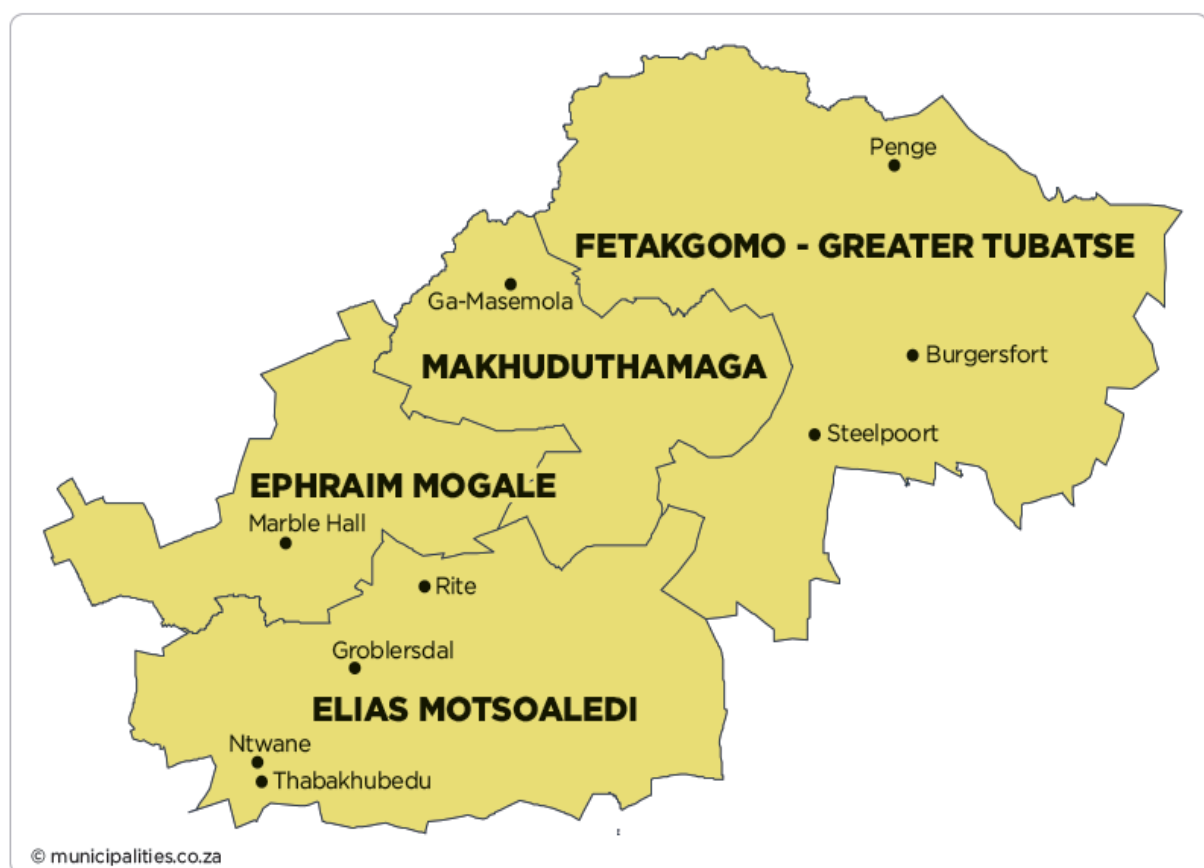
One of the strengths of the qualitative research approach is its ability to uncover startling and unexpected data, which may then be utilised to develop hypotheses and viewpoints. To demonstrate this, consider the argument made by Burns (2000:13), who stated that “Qualitative approaches certainly do not provide easy, quick answers to the complex issues that confront us”. The process used in qualitative research is inductive. Thus, it is important for the researcher to ensure that their personal perspectives, experiences, and opinions do not conflict with those of the respondents. It offers a comprehensive knowledge and portrayal of social actors within their social context.

According to Burns (2000), there is a lot of disagreement between the two study paradigms about validity and reliability because of the subjectivity and sources of the data gathered using qualitative methodologies. According to Rahman (2017), one of the drawbacks of qualitative research is that it largely ignores important contextual concerns and concentrates solely on participant experiences. It may be more difficult and complex to comprehend and analyse data and it may take a long time. This strategy makes sense because the purpose of the study was to learn more about the perspectives and experiences of the intended respondents.

The use of a qualitative research method in this study is essential because it allows for an in-depth understanding of the perceptions, experiences, and actions of various

stakeholders involved, including local government, and mining companies. Qualitative methods, such as interviews and focus groups, facilitate the collection of rich, detailed data that captures the social, economic, and political nuances that influence how mining companies contribute to the development of road infrastructure. This aligns with the interpretivism philosophy, which emphasises understanding the subjective meanings and contextual factors that shape social realities. By using interpretivism, the research acknowledges that the contributions of mining companies are not just driven by economic goals, but are also shaped by social interactions, stakeholder relationships, and local community needs, which can only be fully explored through qualitative approaches.

4.5. Description of the study area



<https://municipalities.co.za/map/1243/fetakgomo-tubatse-local-municipality>

The Fetakgomo Tubatse Local Municipality (FTLM), also known as LIM 476, was established following the merger of the former Fetakgomo and Tubatse local municipalities. Classified as a Category B municipality, it was created under the “Notice in terms of s12 of the Local Government: Municipal Structures Act, 1998 (Act 117 of 1998): Disestablishment of Existing Municipalities and Establishment of New Municipalities,” issued on July 22, 2016. Its boundaries were defined in the Demarcation Notice published in Gazette No. 2629 on November 11, 2015. FTLM is part of the Sekhukhune District Municipality in Limpopo Province.

The Department of Cooperative Governance (2009) identifies Category B4 municipalities, like FTLM, as predominantly rural, economically challenged areas that face difficulties in attracting skilled professionals and generating sufficient revenue. FTLM employs a political governance model combining a collective executive system with ward-level participation. As outlined in Provincial Gazette No. 2735, the municipality consists of 39 wards, making it the third largest in Limpopo by ward count, after Polokwane (45 wards) and Thulamela (41 wards). FTLM is governed by 77 councillors, including 39 ward councillors and 38 proportional representatives, alongside 12 traditional leaders who participate in the council.

FTLM shares borders with Makhuduthamaga Local Municipality (Sekhukhune District), Lepelle Nkumpi Local Municipality (Capricorn District), Thabachweu Local Municipality (Ehlanzeni District, Mpumalanga Province), and Maruleng Local Municipality (Mopani District). According to the 2016 Community Survey by Statistics South Africa, the municipality has a population of 490,381, with more females (251,923 or 51%) than males (238,458 or 49%). The data indicates rapid population growth in its population pyramid. This result presents an analogous situation elsewhere in the Republic of South Africa (RSA), which country has, by and large, more female concentration in her national population pyramid. Of the 490 381 total population, 223 214 are young people. The youth represents 46% of the municipality population.

4.6. Research Population

“A population is the aggregate of all individuals chosen for their unique characteristics and who are of interest to a researcher” (Moffatt, 2015: 53). A population is defined as the whole group of cases, elements, objects, individuals, or events that share a specific characteristic in common and from which the findings of a study are to be

generalised (McMillan & Schumacher, 2010). The target population is the smaller section of the population from which a study sample is taken (Babbie & Mouton, 2016).

4.7. Sampling

Sampling is described as “a process of systematically selecting cases for inclusion in a research project” by (Bless, Higson-Smith, and Kagee, 2006:97). Through sampling, a researcher can draw conclusions about the entire set population from a small selection of samples. Sampling is justified by the fact that time and financial restrictions sometimes make it nearly impossible to use the complete research population (Sarantakos, 2005). Samples make a study more manageable and simpler to administer instrument for higher quality research and research findings and using samples might enable getting more accurate information than using the entire population (De Vos, Strydom, Fouche & Delport, 2011). When it comes to sampling, it is crucial that the researcher can unequivocally show why a certain sample approach was chosen and how it relates to the study. In social science research, there are two different kinds of sampling procedure: nonprobability sampling and probability sampling.

In this study, a prospective sampling was used to select the population. Purposive sampling simply implies that “participants are selected because of some defining characteristics that make them the holders of the data needed for the study” (Nieuwenhuis, 2007:79). Purposive sampling is a method that allows the researcher to ‘handpick’ the sample according to the nature of the problem and the phenomenon being studied. This technique allows a researcher to employ the “fit for purpose” discretion in selecting respondents (May, 2002: 95). Regardless of the approach used, Kothari (2004:57) cautions that researchers need to use extreme caution while creating a sample. A few things to watch out for include systematic bias and sampling error, which may be brought on by a variety of reasons, including inappropriate sampling frame, defective measuring device, nonrespondents, indeterminacy principle, and natural bias in the reporting of data. This was considered while calculating the ideal sample size and response rates needed to provide reliable results.

Purposive sampling is a non-probability sampling, which is also known as a judgemental sampling. According to Saratakos (2005), nonprobability sampling refers

to processes that "do not employ the rules of probability theory, do not ensure representativeness, and are mostly used in exploratory research and qualitative analysis. This implies that the primary consideration of the respondents is based on the judgment of the researcher about who can provide the best information to achieve the objectives of this study.

4.8. Data collection instruments

Data collection means identifying the relevant sources and sets of information that will be appropriate to answer the research question and arrive at the set research objectives (Ajayi, 2017). This also involves deciding on tools and techniques to collect this set of information. For the study to achieve its objectives, two types of data were required, primary data and secondary data. The former refers to data that are collected for the first time by the researcher, while the latter refers to the data already collected or produced by others (Ajayi, 2017). For primary data, the researcher used the use of semi structured interviews, and then for secondary data, the research utilised documentation. These data collection instruments are discussed below.

4.8.1. Semi- structured interviews

According to Kothari (2004:97), "the interview method to collect data involves presentation of oral-verbal stimuli and response in terms of oral-verbal responses". Although interviews are based on preconceived structured or semi-structured questions, "this method of collecting data is usually carried out in a structured way where the output depends on the ability of the interviewer to a large extent" (Kothari, 2004:17). This study adopted a semi-structured interview technique. Semi-structured interview is the type of interview that "uses a less structured approach which sometimes referred to as semi-standardised" (Hall & Hall, 1996:157). It is commonly used in research projects to corroborate data emerging from other data sources. In this case, data emerge from literature review. This data collection technique allows for the investigation and clarification of answers. Furthermore, it is usually associated with open-ended questions which allow respondents to express themselves "more freely could with the closed or force-choice questions of the structured questionnaire" (Hall & Hall, 1996:158).

Like any other technique, the semi-structured interview technique has its advantages and disadvantages. Hall and Hall (1996) argue that face-to-face interviews allow the interviewer an opportunity to guide the interviewee through the questions, ask probing or follow-up questions, and explain any misunderstandings. Face-to-face interviews are viewed as having a higher response rate in compared with other methods because of their ability to provide undiluted focus and build trust between the interviewer and interviewee (Ritchie & Lewis, 2003:36). Similarly, the interviewer also had the opportunity to ask probing or clarity questions to ensure that the responses provided are understood within the scope of this study. This technique was adopted because its advantages outweighed its disadvantages. And it was deemed relevant because of the level of detail it can provide for this study.

The other shortfall, as argued by Hall and Hall (1996: 101), is that respondents can be able to pre-empt the interviewer's expected responses and as a result "provide the answers they think the interviewer wants to hear". Indeed, in some cases, respondents managed to answer more than one question at a time, but that did not impact negatively on the outcome of the study. May (2002:123-124) acknowledges the fact that given its semi-structured nature, which gives "a greater degree of latitude" to the respondent, it is therefore of crucial importance that interviews are conducted by researchers themselves given their understanding of both the 'context and content of the interview. In this case, all interviews were conducted by the researcher.

The interviews were conducted by the researcher in August 2024 and were administered for municipal officials who are the participants in the study. The initial number of participants that the researcher had intended to interview was 18 (municipal officials and mining executives), but the researcher eventually interviewed only 5 participants from the municipality. As for the mining companies, letters were sent to the concerned office to request permission to conduct the collection of data for the study (through interviews) in May 2024 (attached as annexures). Of the 4 mines who received letters requesting permission to conduct research, only 2 mines responded. The 2 mines that responded did not show any interest to participate in the study. Therefore, no one was interviewed from the said mines. As such the researcher resorted to existing documents such as SLPs of the mines to gain and provide insight into the nature and extent of the involvement of mining companies in the development

of road infrastructure development (see Section 4.8.2) around Fetakgomo Tubatse Local Municipality. To complete the proposed study, the researcher continued to collect data from municipal officials only. According to research ethics, participants have the right to refuse to participate in a research study.

4.8.2. Secondary data

In simple terms, secondary data is any dataset not obtained by the author, or “the analysis of data gathered by someone else” (Boslaugh, 2007:9). Secondary data may include data that have been previously gathered and are being considered to be reused for new questions, for which the data gathered were not originally intended (Vartanian, 2010). Furthermore, secondary data are the data gathered from published sources, meaning that the data are already gathered by someone else for another reason and can also be used for other purposes in research (Hamed, 2021). In all papers, the literature review section is based on secondary data sources. Thus, secondary data are an essential part of research that can help to get information from past studies as basis for implementing research or as the required background information. It can also help design a study and provide a baseline to compare primary results. However, according to Hamed (2021) it should be noted that researchers need to re-examine the validity and reliability of these backgrounds to gain authentic results. There are different sources of secondary data, such as records, books, research articles, and Internet articles. In some cases, the respondents do not allow revealing data, and the study should be conducted based on secondary data. In this study, documents such as SLPs, IDPs, LEDs, strategic plans, thesis, and articles were used as secondary data sources.

4.9. Data Analysis

The study adopted a theme-based and objective-based approach to collaborate and analysing the data. This meant that the responses were clustered in terms of themes that were derived from the study objectives as well as document analysis. This will be informed by both content and process analysis outputs. Terre Blanche, Durrheim and Painter (2006:51) assert that “data are basic material with which researchers work, come from observations, and it is essential that the researcher has solid data to analyse and interpret”. They also take the argument even further by highlighting the importance of considering and planning for data analysis methods before the data is

collected. This is crucial because data analysis is considered as “transforming information (data) into an answer to the original research question” (Terre Blanche, Durrheim & Painter, 2006:51). For the purpose of data analysis in this study, a combination of thematic data analysis and content analysis was employed.

4.9.1. Thematic data analysis

Thematic analysis as an independent qualitative descriptive approach is primarily described as “a method of identifying, analysing, and reporting patterns or themes in data” (Braun & Clarke, 2006:79). It was also introduced as a qualitative descriptive method that provides researchers with the basic skills to conduct many other forms of qualitative analysis. Thematic analysis is a method of identifying, organising and giving systematic insight into patterns of meaning (themes) on a data set. By focussing on the meaning of a set of data, thematic analysis allows the researcher to see and understand collective or shared meanings and experiences. Identifying unique and idiosyncratic meanings and experiences found in a single piece of data is not the purpose of thematic analysis. This method is therefore a way to identify commonalities in approaching or writing a topic and to understand these commonalities. The themes were created from the research objectives of the study. From each objective, a research theme was developed, this was done using the Nvivo14 plus software.

4.9.2. Content Analysis

Content analysis is a comprehensive term that encompasses a range of methodological strategies employed to systematically examine and interpret textual data (Powers & Knapp, 2010). This approach involves systematic coding and classification of text, enabling researchers to discretely uncover and analyse substantial volumes of textual information. Through this method, researchers can identify recurring trends and patterns in word usage, as well as examine the frequency, relationships, and structure of the content, all of which contribute to understanding the underlying communicative discourse (Mayring, 2014). The primary objective of content analysis is to describe and interpret the characteristics of document content by carefully investigating who is conveying a message, what the message entails, to whom it is directed, and the intended or resultant effects of this communication (Bloor & Wood, 2006). This was done by reviewing the different documents and then drawing conclusions from what is found in the documentation analysed.

4.10. ETHICAL CONSIDERATIONS

Research ethical considerations are essential aspects of any study involving human subjects or animals. Adherence to ethical principles is crucial to ensure the well-being, rights and dignity of participants, as well as the integrity and credibility of the research itself.

4.10.1. Informed Consent

Obtaining informed consent from all participants is critical. Participants should be fully aware of the purpose, methods, potential risks, and benefits of the study before agreeing to take part. Informed consent helps protect the autonomy and ensures that their participation is voluntary and based on a thorough understanding of the study (Israel, 2015). Researchers must obtain voluntary and informed consent from participants prior to their participation in the study. Participants were fully informed about the purpose, procedures, risks, and benefits of the research. They also signed the consent forms, in which they agreed to the interview. They were also informed that they have a right to withdraw from the interview should they feel uncomfortable.

4.10.2. Confidentiality and Anonymity

Maintaining the confidentiality and anonymity of participants is essential to protect their privacy. Researchers must ensure that personal information is securely stored and that any identifying details are removed from published results (Babbie, 2016). This is particularly important in sensitive areas such as mining, where stakeholders might have concerns about sharing information. The researcher ensured the confidentiality and anonymity of the participants. Identifying information was protected, and data was reported in aggregate form. The names of the participants were not disclosed, they were given pseudo names, no personal information of the participants was required and disclosed.

4.10.3. Transparency and Accountability

Maintaining transparency throughout the research process is crucial. This includes clear communication with stakeholders, regular updates on the progress of the research, and openness about the methodologies used. Researchers should also be accountable for their work, ensuring that the data collected is accurate and the analysis is rigorous (Yin, 2018). The researcher made sure that transparency was

emphasised throughout the study. The researcher did not hide any information from the researcher.

4.10.4. Integrity

Researchers must conduct their studies with honesty and integrity. Data was not manipulated, and the researcher did not have any personal interests or biasness on the research.

4.10.5. Validity and Reliability

Validity and reliability are achieved when researchers rigorously follow several verification strategies during the research process (Rolfe, 2006). This suggests that standard notions of 'reliability and validity' are used to evaluate the procedure. According to Rolfe (2006), validity concerns in qualitative research should be associated with 'trustworthiness,' which becomes a matter of persuasion whereby the scientist is viewed as having made those practices visible and, therefore, auditable rather than truth or value, as positivists do. According to this idea, research rigour should take precedence over validity and reliability in qualitative research projects. The rigour is determined by its ability to monitor and validate the research procedure.

The validity of the study data in this study was ensured during the construction of the interview questions by ensuring that the questions are in simple English, unambiguous, accurate and was easily understood by the respondents. To intensify validity and reliability of the study outcome, the following was adhered to during the design and data collection: clear instructions and explanations included in the interview questions to guide respondents to answer the questions; respondents were selected based on their expertise and knowledge of the issues involved in the study to ensure trustworthiness and dependability. All interviews were recorded to ensure accurate capture of evidence and documentation for analysis.

4.10.6. Accuracy

Accuracy refers to the closeness of the data values to the true values. Accurate data is essential to draw valid conclusions from research. Techniques such as data verification and validation checks can help ensure accuracy (Biemer & Lyberg, 2003). The researcher ensured that the accuracy of the data was emphasized. This was done, by which the researcher made sure that the collected data was presented as is from the participants.

4.10.7. Completeness

Completeness means that all necessary data are present. Incomplete data can lead to biased results and misinterpretation. Researchers should implement thorough data collection protocols and use imputation methods to address missing data (Little & Rubin, 2002). The completeness was of the utmost importance in the study.

4.10.8. Trustworthiness

Research trustworthiness is a critical aspect of scholarly work, ensuring that findings and conclusions are reliable, credible, and can be confidently used to inform further research or practice (Patton, 2014). Trustworthiness in research is generally evaluated based on four key criteria: credibility, transferability, dependability, and confirmability. Techniques such as prolonged engagement, persistent observation, triangulation (using multiple data sources or methods), member checks (getting feedback from participants), and peer debriefing are commonly used to enhance credibility (Bitsch, 2005). Providing rich, thick descriptions of the research context and participants enables others to determine whether findings are transferable to their own situations.

4.11. Conclusion

The chapter explained the methods that were used in the study. It explained how the study used the critical thematic analysis to analyse collected data. The methods that were used to collect data, which are semi-structured interviews, an explanation of how the study utilised Interpretivism approach as the research philosophy. These methods then gave a directive for the analysis of recommendation to be done. The following chapter will be an explanation of the findings and the analysis of the findings

CHAPTER 5: PRESENTATION, INTERPRETATION AND ANALYSIS OF FINDINGS

5.1. Introduction

The methodology and research strategy used to collect data was covered in the previous chapter. The results of the study's findings and data are presented in this chapter. Individual interviews served as the primary means of data collection in this qualitative method. Data were analysed using a thematic data framework, and themes were created based on the study goals. The information provided by the participants was coded and analysed using NVivo 14. The first part of this section discusses the demographic profile of the participants, preliminary issues such as word cloud, and the themes that emerged from coding the data on NVivo 14. The last part discusses the study themes in detail.

The study sought to investigate the role of mining companies in road infrastructure in mineral extraction areas. The study was carried out in the Fetakgomo Local Municipality and selected mines in FTLM in Limpopo.

5.2. Demographic information of participants

This section presents the demographic data of the participants interviewed for the study in the Fetakgomo Tubatse Local Municipality. Five officials of the Fetakgomo Tubatse Local Municipality were interviewed. Table 3 below shows the list of respondents' pseudonyms and codes of ensuring anonymity of the respondents, the researcher named respondents as municipal officials 1-5, and for the purpose of data presentation a pseudo code FTLMO 1-5 which denotes Fetakgomo Tubatse Local Municipality.

Table 1: Pseudo Names

Respondent	Pseudonym code
Municipality official one	FTLMO1
Municipality official two	FTLMO2
Municipality official three	FTLMO3
Municipality official four	FTLM04
Municipality official five	FTLM05

Table 2: Demographic data illustration

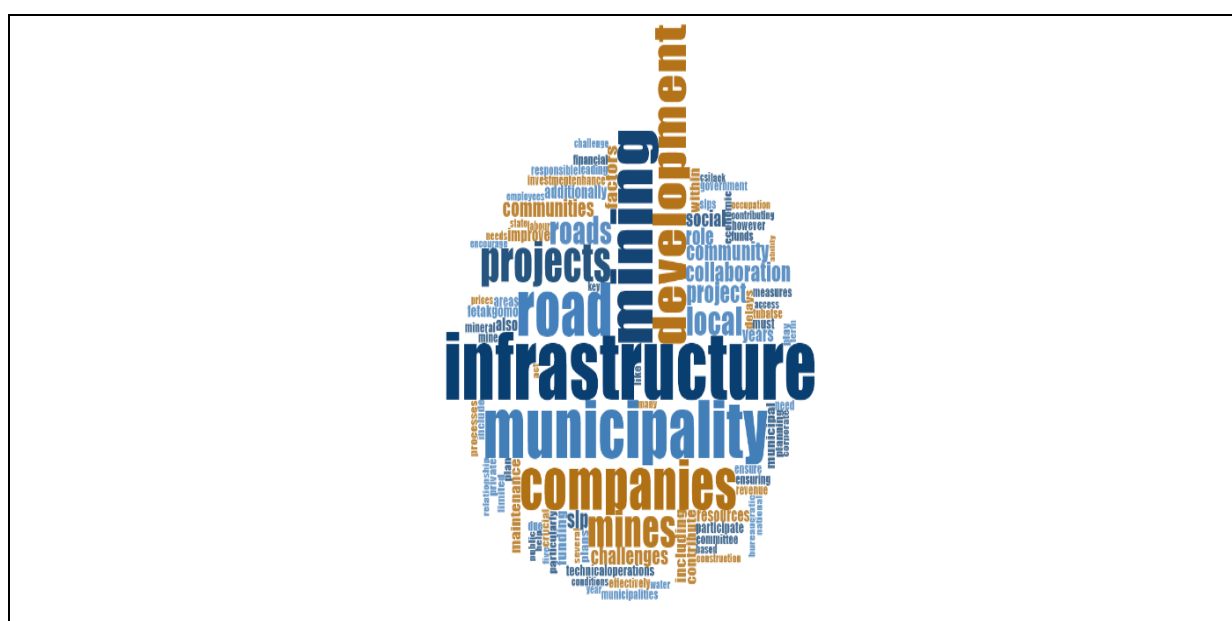
Participants	Gender	Qualification	Experience in years
Participant 1	Male	Masters degree	4
Participant 2	Male	Degree	3
Participant 3	Male	Degree	4
Participant 4	Female	Diploma	1
Participant 5	Female	Diploma	1

(Source: Own illustration)

Table 2 graphs or shows the gender, qualifications and the experience of the municipal participants. The majority of the participants were men and only two were female. Two participants have degree qualifications, one has a diploma, and one has a master's degree. Three of the participants have more than three years of work experience and then two has got one year of experience.

5.3. Research Analysis

Figure 2 shows a word cloud generated from NVivo14 and shows the words most frequent used words from the responses of the participants.



(Source: Own illustration generated from NVivo14)

Figure 2: Word Cloud

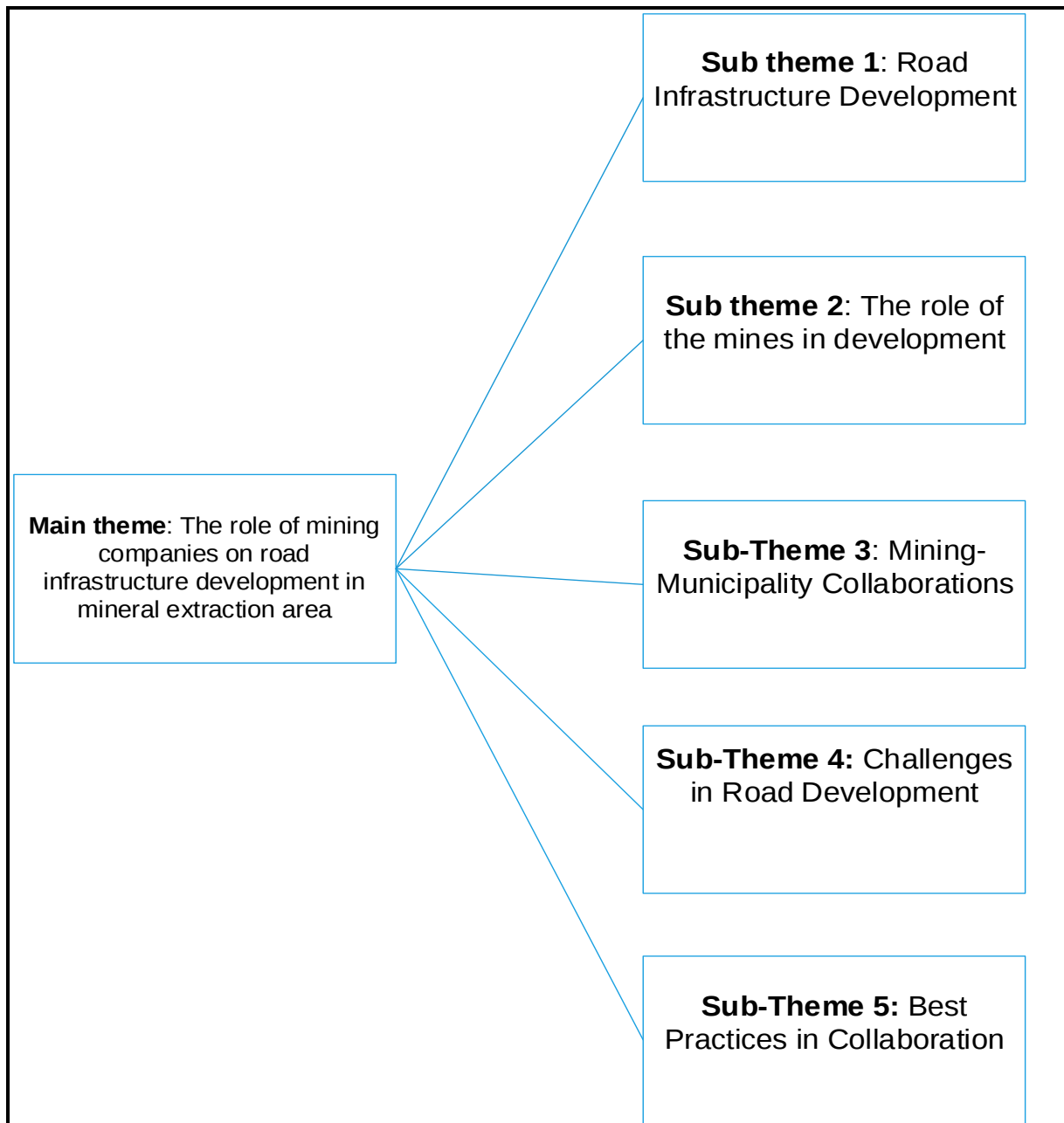
Figure 1 shows a word cloud that emphasises the terms most frequently used terms obtained from the recorded interviews. The word cloud prominently features key terms such as "infrastructure," "municipality," "mines," "companies," "collaborations," "developments," and "projects." These terms encapsulate the main topics deliberated by participants, highlighting a significant emphasis on the participation of different stakeholders in tackling local road infrastructure issues, especially in regions with significant mining activities.

Within the context of the topic *"The role of mining companies on road infrastructure development in mineral extraction areas: A case study of selected mines within Fetakgomo-Tubatse Local Municipality"*, the regular reference to "mines" and "infrastructure" highlights the substantial influence that mining companies exert on the progress of local infrastructure. Effective cooperation between mining firms, local governments, and other stakeholders is crucial to ensure that road infrastructure adequately adapted to the requirements of both the mining sector and the wider community. The word cloud serves to strengthen the idea that achieving sustainable development in mineral extraction regions relies on the synchronised efforts and dedication of different organisations, especially in dealing with road infrastructure to promote economic expansion and ensure the welfare of the community.

5.3. Themes based on interview questions

The research conducted semi-structured interviews with four municipal officials running specific departments in the Fetakgomo-Tubatse Local Municipality. Thematic content analysis was used to analyse the data to generate a demographic of the participants. The data was loaded onto NVivo14 to create codes grouped into themes and subthemes. The following figure shows an overview of the participants.

Figure 3: Themes



(Source: own illustration generated from NVivo14)

The themes are organised as follows:

1. Road Infrastructure Development
2. Mines' Role in Development
3. Mining-Municipality Collaborations
4. Challenges in Road Development
5. Best Practices in Collaboration

5.3.1. Development of road infrastructure

Respondents were asked about their perception of the state of the road infrastructure in the local municipality of Fetakgomo Tubatse, so that it could help shape the study and help to address the objective that looks at the state of road infrastructure in the municipality. The responses from the respondents were more divergent in relation to the question posed.

FTLMO1 responded with the following:

“We are predominantly a rural municipality. We are having a big challenge with the infrastructure, especially around roads and stormwater. And water, sanitation, and electricity. In fact, our electricity backlog is about 80,000. Most of our roads are not tarred. As we speak here, we are collaborating with the mines to intervene where we can achieve all these service delivery obligations.”

Although the perception on the state of road infrastructure was:

“I cannot say that we are having a bad or a good road infrastructure, but we are coming very well when it comes to road infrastructure.”

FTLMO3 added to the responses by saying that:

“The road infrastructure in Fetakgomo Tubatse Local Municipality is mixed. Urban areas have well-maintained roads, but many rural areas face poor conditions. The demand for road development exceeds the capacity of the municipality, resulting in significant backlogs.”

FTLMO4: responded by saying that:

“The state of road infrastructure development in Fetakgomo Tubatse local municipality is currently under strain. Although there are some developed areas, many rural parts of the municipality suffer from poor road conditions, including difficult-to-use gravel roads, especially during the rainy season. Maintenance is often insufficient, leading to deteriorated road surfaces that hinder transportation and access to essential services.”

FTLMO5 added by saying that:

‘Our municipality is a mixture of rural and semi-urban areas, which means that road conditions differ a lot due to the load of transport in carriers. The large roads connecting larger towns are typically in better condition than those in the rural areas of Fetakgomo. Roads in rural areas are mostly in bad condition.’

The responses of municipal officials from the Fetakgomo Tubatse Local Municipality reveal diverse perspectives on the state of the development of road infrastructure. The analysis indicates that the opinions among the officials are mixed. Some respondents perceive the road infrastructure the area of study as being in poor condition, while others regard it as moderately maintained. Additionally, a respondent appeared uncertain about the current state of road infrastructure, expressing neither a positive nor a negative assessment. During the interviews, a respondent noted that the municipality faces challenges related to various types of infrastructure, including water, sanitation, and electricity, and that it is collaborating with local mines to address these issues. However, the respondent did not specifically emphasise road infrastructure. In general, the responses tended to include a broader discussion of infrastructure rather than explicitly focussing on roads, leading to lack of clarity on the specific condition of road infrastructure within the municipality.

The findings of the study reveal a marked disparity in road conditions between rural and urban areas. Urban centres generally boast better-maintained roads, whereas rural regions suffer from poor infrastructure. These findings are consistent with that of Mabin and Buthelezi (2017) who posits that rural municipalities often fall behind their urban counterparts in infrastructure development due to limited resources, impeding both service delivery and overall development. The noted infrastructural challenges, including roads, stormwater systems, water, sanitation, and electricity, underscore a broader issue of inadequacy within rural municipalities special in FTLM. These findings resonate with that of Mahlati's (2020) study, which highlights the persistent struggle of rural municipalities to provide basic services, largely attributable to insufficient funding and inadequate planning.

The municipality's collaboration with mining companies to fulfil service delivery obligations exemplifies a common practice in mineral extraction areas, where local governments partner with private entities to supplement scarce public resources

(Thompson & Tapscott, 2010). Although this collaboration is often necessary, it can be contentious, depending on the specifics of the agreements and the long-term sustainability of such partnerships. The characterisation of road infrastructure as "moderate" suggests that, although there have been improvements, significant challenges persist. This mixed state of road infrastructure is not uncommon in South African municipalities, where some progress has been made since the end of apartheid, but considerable backlogs remain, particularly in rural areas.

The findings support stakeholder theory, which highlights the importance of balancing the interests of different groups to drive development. The partnership between the municipality and mining companies demonstrates this idea, as it shows businesses working alongside local governments and communities to create mutual benefits. However, the uncertainty surrounding road infrastructure conditions raises concerns about whether all stakeholders are being fully engaged and informed. This lack of transparency could weaken the impact of these collaborations in tackling rural infrastructure challenges.

5.3.2. Mines Roles in road infrastructure development

Participants were asked to share their knowledge on the role that the mining companies play in the development of the road infrastructure in the municipality. The responses from the participants were mostly moving towards the same direction, their perceptions on the role of the mining companies were more or likely closely related. The respondents felt that mining play a crucial role in helping with service delivery backlog. In further clarifying their views, the respondents stated:

FTLMO1 mentioned that:

"The mines play a crucial role in addressing service delivery backlogs, including road infrastructure development, as outlined in the municipality's Integrated Development Plan (IDP). Through their Social Labour Plans (SLPs), mines are required to contribute to development within a 20-kilometer radius of their operations. However, they are limited to this area and cannot contribute to projects beyond it. Additionally, mines are obligated to allocate part of their SLP budget to labor-sending areas, which are regions where many of their employees reside. For example, if most of the

employees are from Lydenberg but work in Fetakgomo, a portion of the SLP funds must be invested in Lydenburg.”

According to FTLMO2:

“Mines contribute to road infrastructure development primarily through their Social and Labour Plan (SLP) programmes. They consult with local communities to identify their needs and align them with the municipality's Integrated Development Plan (IDP). Once the priorities are established, the mines implement projects, including the construction of internal roads, libraries, and schools. This collaborative approach has led to noticeable infrastructure improvements in communities near the mines.”

FTLMO3 highlighted that:

“I can say that mining companies have a crucial role to play in helping to develop the road infrastructure. They can contribute financially to the construction and maintenance of roads, especially those used to transport mining products. Moreover, they can provide technical expertise, equipment, and manpower to accelerate road infrastructure projects.”

FTLM04:

“Mining companies can play a significant role by providing funding, resources, and technical expertise to assist with road infrastructure development. They could participate in public-private partnerships to co-finance road construction and maintenance projects. Additionally, they can support capacity-building initiatives to equip the municipality with the skills needed to manage infrastructure projects more effectively.”

FTLM04:

“Mining companies can play a significant role by providing funding, resources, and technical expertise to assist with road infrastructure development. They could participate in public-private partnerships to

co-finance road construction and maintenance projects. Additionally, they can support capacity-building initiatives to equip the municipality with the skills needed to manage infrastructure projects more effectively.”

FTLMO5:

“Mining companies can play a crucial role in addressing the road infrastructure backlog in Fetakgomo Tubatse through public-private partnerships. By collaborating with the municipality, they combine resources to finance and accelerate road construction and maintenance projects, helping to close budget gaps. This cooperation not only improves the local infrastructure, but also strengthens community relations and boosts the local economy.”

The analysis of responses from municipal officials to the role of mining companies in the development of road infrastructure reveals a pattern of perspectives that underscores both actual and potential contributions of the mines. The respondents acknowledged that mining companies have played a significant role in the development of road infrastructure within the communities surrounding their operations. Their initiatives have facilitated better access to essential services, enhanced connectivity, and contributed to regional economic development.

However, it is noteworthy that while some respondents affirmed the active role of mining companies in infrastructure projects, others shifted the focus toward the potential contributions these companies could make. This divergence in responses suggests that, while there are instances of tangible contributions, there is also an expectation for further participation and investment from mining companies.

A recurring theme in the responses is that the participation of mining companies in road infrastructure is primarily driven by their compliance with Social and Labour Plans (SLPs). According to respondents, the commitments stipulated in the SLPs serve as a regulatory mechanism that requires these companies to invest in local infrastructure as part of their broader corporate social responsibility initiatives. This indicates that, while there are beneficial outcomes, the participation of mining companies may be more of an obligation than a voluntary commitment, raising questions about the sustainability of such infrastructure projects once the legal requirements are met.

Generally, mining companies in South Africa are required to contribute to development within a 20-kilometer radius of their operations, according to DMRE. This geographical limitation implies that communities located beyond this radius may not benefit from these contributions, potentially leading to disparities in service delivery and road infrastructure development. The findings highlight that part of the Social and Labour Plan (SLP) commitments made by mining companies in Fetakgomo Tubatse Local Municipality are directed towards labour-sending areas, where the majority of mine workers reside. This indicates that mining companies adopt a dual focus in their development efforts, targeting both the communities surrounding the mines and those from which their workers come from.

The collaborative approach employed by mining companies involves consultations with both communities and the local municipality to align development projects with community needs and the municipality's Integrated Development Plan (IDP). This strategy is designed to ensure that the projects implemented are beneficial and responsive to the actual needs of the community. Furthermore, mining companies must contribute not only financially but also by providing technical expertise, equipment, and manpower, which can significantly improve the quality and speed of road infrastructure development projects.

The findings show that mining companies must be actively involved in the development of road infrastructure and other community projects within their operational areas. Selmier (2017) supports this perspective, noting that mining companies' contributions to local development, such as building schools and roads, are often perceived as part of their corporate social responsibility. This is consistent with the findings, which mention that mining companies build libraries, schools and roads as part of their SLP commitments.

However, Benkenstein (2014) notes that despite the involvement of mining companies in local development, there are often complaints from communities about the limited geographical scope of these contributions, which can lead to tensions. The 20-kilometer radius limitation mentioned in the findings could be seen as a factor that restricts the contributions of the broader impact of the mining companies. Marais (2013) further highlight that the focus on areas immediately surrounding mining operations often results in the neglect of broader regional development needs. This

could contradict the portrayal of mining companies as key players in road infrastructure development, suggesting that their contributions may not address the needs of the wider community in a comprehensive way.

These findings align with stakeholder theory, which emphasises that businesses should consider the interests of various groups such as local communities, employees, and government authorities rather than prioritizing profit alone. The mixed reactions from municipal officials suggest that while mining companies do invest in road infrastructure, their contributions are often viewed as merely meeting legal obligations rather than genuinely addressing the broader needs of the community. This underscores the ongoing challenge of encouraging mining companies to take a more inclusive and sustainable approach one that goes beyond regulatory compliance with Social and Labour Plans (SLPs) to create lasting benefits for all stakeholders involved.

5.3.3. Mining-Municipal Collaborations

Participants were asked what they think are the factors or drivers that influence mining companies' participation in road infrastructure development projects within the municipality. These were the responses that each participant gave:

FTLMO1: *“Mining companies participate in road infrastructure development due to several factors:*

Regulatory requirements: The Mineral and Petroleum Resources Development Act requires that mining companies set aside funds to develop the areas where they operate. This obligation is reinforced by the Companies Act, which requires businesses to invest in local communities as part of their corporate social investment (CSI) responsibilities. Corporate Social Investment: The Companies Act of 2008 stipulates that companies must allocate at least 1% of their profits to social investments. This encourages mining companies to contribute to infrastructure projects that benefit communities around their operations. Community stability: Voluntarily, mining companies also participate in infrastructure projects to ensure stability within local communities. These projects create short-term employment opportunities, especially for unskilled workers, reducing local dependency on the mines for jobs and fostering goodwill.”

FTLMO2:

“Mining companies are compelled by law to participate in the development of road infrastructure, particularly through the implementation of Social and Labour Plans (SLP). This is not a matter of choice but rather a legal requirement enforced by the Department of Mineral Resources and Energy (DMRE). In essence, mines do not need any motivating factors except that they should be resourceful to the communities within which they operate. It must be said that before implementing SLP projects, mining companies must first present their plans to the municipality's SLP committee and ensure that their projects align with the Integrated Development Plans (IDP) of the municipality. Once alignment is confirmed, the municipality issues an endorsement letter, which the company must then present to the DMRE for final approval. Without these endorsements, any mining activity or SLP implementation would be considered illegal. The SLP projects operate on a five-year cycle, which means that companies must renew their plans and obtain new endorsements every five years to continue operations. Failure to comply with these regulations results in legal consequences, including the potential closure of the mine.”

FTLMO3:

“Factors include the need for reliable access to mining sites, corporate social responsibility (CSR) commitments, and the potential for reduced operational costs through improved road conditions. Additionally, positive community relations and local stakeholder expectations can encourage mining companies to invest in infrastructure.”

FTLM04:

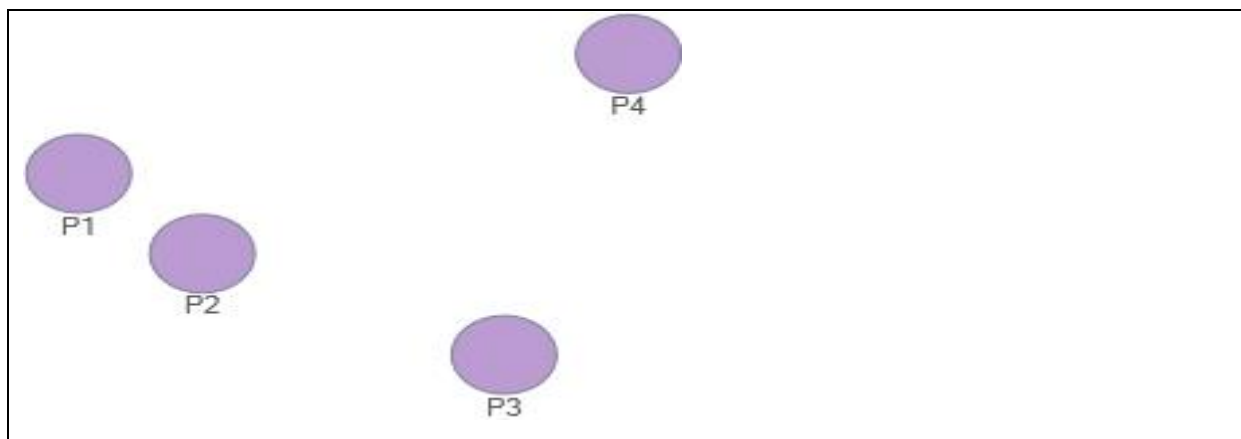
“Corporate social responsibility (CSR). Mining companies are often motivated by the desire to maintain a positive relationship with local communities, which can enhance their social licence to operate. Furthermore, well-maintained roads are crucial for transporting

materials and employees, which directly benefits their business operations.”

FTLMO5:

“Mining companies are encouraged to participate in the development of road infrastructure due to corporate social responsibility (CSR) obligations. Engaging with local communities and investing in visible, impactful projects like road development allows them to fulfil these obligations and demonstrate their commitment to community development.”

Figure 4: Network sociogram



(Source: own illustration generated from NVivo14)

Figure 5.3 represents Sociograms, which is significant in this study as it offers valuable insights into the organisation and dynamics of social networks, allowing researchers to identify influential individuals, evaluate the flow of communication, and understand the solidarity or disintegration of communities. It shows that opinions of participants 1 and 2 are similar, while 3 is not that distant from 1 and 2, however, participant 4 has a different opinion.

The responses provided by the participants show a significant degree of similarity, and all respondents generally agree on the primary motivations behind the participation of mining companies in road infrastructure. The consensus among the respondents suggests that corporate social responsibility (CSR) and Corporate Social Investment (CSI) are the main drivers that compel or encourage these companies to participate in such developmental activities. Mining companies, as part of their CSR and CSI

initiatives, often undertake projects aimed at improving local infrastructure, including road networks, to contribute to the socioeconomic development of the communities within which they operate. This involvement not only benefits the local population but also enhances the public image and fosters goodwill within the community.

In addition, one of the respondents introduced an important perspective by highlighting that compliance with regulatory requirements also plays a role in motivating mining companies to invest in road infrastructure. This suggests that beyond voluntary contributions through CSR and CSI, there are statutory obligations that can require companies to participate in community development projects, including the development of essential infrastructure. Such regulations may be part of broader government policies aimed at ensuring that mining activities contribute to the economic and social well-being of the regions where these companies are based.

Therefore, it can be concluded that while CSR and CSI are essential to driving road infrastructure projects by mining companies, regulatory frameworks also significantly influence their participation in such developmental activities.

The responses collectively illustrate a comprehensive view of why mining companies participate in the development of road infrastructure. The legal framework provided by the Mineral and Petroleum Resources Development Act and the Companies Act establishes a foundation for these investments, ensuring that mining companies contribute to local development as part of their operational responsibilities. The emphasis on SLPs highlights the structured and regulated approach to community investment, ensuring alignment with broader municipal goals through IDPs. This alignment reflects a deliberate effort to integrate mining activities with local development plans, reinforcing the importance of collaboration between companies and municipalities.

The focus on community stability and corporate social responsibility (CSR) underscores the dual motivations of regulatory compliance and voluntary contributions to social welfare. By investing in infrastructure, mining companies not only fulfil their legal obligations but also contribute to the socioeconomic stability of the communities in which they operate. This approach benefits both the companies, by securing their operational environment, and the communities, by providing essential infrastructure and employment opportunities.

The findings support stakeholder theory, which highlights the importance of businesses considering the needs of all affected parties such as communities, government, and employees rather than prioritising profits alone. In this context, the role of mining companies in developing road infrastructure shows an effort to balance these different interests by responding to community needs while meeting regulatory requirements. This suggests that mining companies invest in such projects not just to comply with the law or improve their reputation, but also to foster long-term relationships with key stakeholders, strengthening their social license to operate and ensuring sustainable business operations.

5.3.4. Challenges in Road Infrastructure Development in the municipality

Participants were asked to provide information on the challenges that the municipality faces in road infrastructure development. Their responses were as follows:

FTLMO1 responded that:

“Inadequate Funding: Due to the rural nature of the municipality, it is difficult to generate sufficient income. Most of the revenue is raised from urban areas, which make up only about 20% of the municipality. This imbalance hampers funding for infrastructure projects. Ongoing Protests Protests can disrupt project implementation, causing delays and contributing to backlogs. Lack of forward planning: Without long-term planning (10-20 years), it is challenging to secure funding and resources. Proper planning is essential to be ready for project execution. High unemployment: High unemployment means that fewer residents contribute to municipal revenue, weakening the financial base needed for self-sustained infrastructure development. Unpredictable Budgets: National budget allocations can be unexpectedly reduced due to financial consolidation and austerity measures, disrupting pre-planned projects.”

FTLMO2 responded as follows:

“The primary challenges include inadequate funding, limited technical expertise, and bureaucratic delays. Additionally, the rapid expansion of settlements in some areas has outstripped the municipality's ability to provide necessary infrastructure.”

FTLM03:

“The challenges of the road infrastructure include the high costs of construction and maintenance, the difficulty in securing long-term funding, and environmental factors such as seasonal flooding that damage roads. There is also the challenge of balancing the needs of different communities with limited resources.”

FTLM04:

“The main challenges include limited financial resources. Municipalities often struggles to secure adequate funding for large-scale infrastructure projects. Additionally, there is a shortage of qualified personnel to plan and execute these projects, leading to inefficiencies and suboptimal results. Delays in procurement processes and regulatory approvals further complicate the situation.”

FTLM05:

“The municipality often operates with limited budgets, making it difficult to fund road infrastructure projects. The little available funding is allocated to immediate needs like road maintenance, leaving very little for new development or upgrades. FTLM relies so much on national and provincial government funding, which may not be enough or delayed.”

In analysing the responses of the participants, a clear consensus emerges regarding a number of challenges associated with the development of road infrastructure in the Fetakgomo Tubatse Local Municipality. A dominant issue identified by all respondents is the lack of adequate funding, which consistently hampers the successful implementation and maintenance of road projects. This financial constraint was universally recognised as a significant barrier to progress.

Furthermore, respondents underscored social challenges, with community protests frequently disrupting road development projects. These protests, often rooted in broader socioeconomic grievances, pose logistical delays and financial setbacks, further straining already limited resources. In addition to protests, respondents highlighted the lack of forward planning as a critical weakness in infrastructure projects. This shortcoming is exacerbated by high levels of unemployment and

unpredictable budgets, which create further uncertainty in the planning and execution of road developments. Other operational and logistical challenges cited include the scarcity of technical resources and bureaucratic inefficiencies, particularly in obtaining the necessary permits and approvals. This contributes to delays and increased costs. Furthermore, the rapid urban expansion in certain areas places further strain on existing infrastructure, requiring urgent and often costly road improvements to meet growing demand.

The financial burden of road construction and maintenance was another major concern expressed by the respondents. They noted that rising construction costs, compounded by the need for ongoing maintenance, place a significant strain on available financial resources. This situation is worsened by environmental factors, such as floods, which frequently damage roads, requiring expensive repairs that further deplete limited budgets. A shortage of skilled personnel was also highlighted as a major challenge, and many respondents noted that technical expertise in road construction and maintenance is insufficient to meet current demands. One respondent specifically emphasised the difficulty of balancing community needs with constrained resources, further complicating decision-making processes. This sentiment reflects the greater challenge of aligning development goals with the realities of limited financial and human resources.

Municipalities, including FTLM, struggle to generate sufficient revenue due to their rural nature, where only urban areas contribute significantly to the revenue base. This heavy reliance on urban-generated taxes leaves rural areas underserved, and this view is supported by SALGA (2018), arguing that rural municipalities often face difficulties in raising adequate revenue, leading to road infrastructure deficits. Moreover, high unemployment rates exacerbate this issue, as a substantial portion of the population is classified as indigent, thus reducing revenue from rates and taxes. This situation adversely affects the financial sustainability of the municipality and its ability to fund critical infrastructure projects, particularly road infrastructure in the Fetakgomo Tubatse Local Municipality (FTLM).

Protests can delay road infrastructure projects, leading to backlogs and increased costs. Booysen (2011) notes that service delivery protests are common in South Africa and can severely hinder municipal projects, collaborating with the findings in the data.

Additionally, the importance of long-term planning is highlighted, particularly the need to have a 10- to 20-year plan to secure funding from financial markets or grant sources. Poor planning often results in missed opportunities to secure funds and implementing projects, as municipalities that fail to plan adequately struggle to harness resources effectively.

Furthermore, high unemployment rates diminish the ability to pay municipal rates and taxes, which are crucial for financial sustainability. The prevalence of indigence, where many residents are too poor to pay for services, presents a significant challenge for local governments in generating revenue. This issue is corroborated by findings from the South African Local Government Association (SALGA, 2015), which indicate that unemployment is a major barrier to municipal revenue generation. The unpredictability of budget allocations from the national government further complicates planning and project implementation, with the findings indicating instances where expected funds were reduced due to national austerity measures. Environmental factors, such as seasonal flooding, also play a critical role in exacerbating road infrastructure challenges. These floods damage roads and increase maintenance costs, a common issue in municipalities with limited resources for infrastructure resilience such as the Fetakgomo Tubatse Local Municipality. The impact of climate variability on municipal road infrastructure, who discusses how environmental challenges exacerbate existing road infrastructure problems.

Stakeholder theory helps make sense of these findings by stressing the importance of inclusive collaboration in infrastructure projects. The challenges uncovered such as financial limitations, social unrest, and poor planning underscore the need to balance the interests of all key players, including local communities, government bodies, and mining companies. Without active participation and a shared sense of responsibility, conflicting priorities among stakeholders will likely continue to slow down progress in road infrastructure development within the Fetakgomo Tubatse Local Municipality.

5.3.5. Enhancing Mining-Municipal Collaborations

Participants were asked to comment based on their experience on what are the measures that maybe can be implemented to improve the role that the mining companies play in helping the development of the municipality with the road infrastructure, and to improve the collaboration that they can have with the mines. The

responses of the participants were divergent as they have had different experiences with mining companies. The responses were as follows:

FTLMO1:

“To improve the role of mining companies in supporting the development of municipal road infrastructure, several measures can be considered:

Policy Reform on Revenue and Billing The current Municipal Property Rates Act (MPRA) limits municipalities to claim property rates only on surface properties, which results in under-contribution from mines. Introducing specialised valuation processes, such as geological assessments, can help to accurately value underground resources, leading to increased revenue from mining operations. Revised Tariffs: Municipalities can introduce additional percentages for mining companies, ensuring that they contribute more equitably to local fiscal needs. For instance, Fetakgomo Tubatse Local Municipality recently implemented this approach to address undercharging. Leveraging Social and Labour Plans (SLPs): Municipalities can consolidate funds from SLPs and use them as collateral to secure loans from debt capital markets or institutions such as the Development Bank of Southern Africa (DBSA). This can accelerate service delivery by focussing on income-generating infrastructure. Concession-Based Funding: Partnering with the National Treasury, municipalities can blend mine commitments with government grants. This allows municipalities to borrow funds at lower or no interest rates, using SLPs and grants as repayment sources. Land-Based Financing: Mines can contribute to bulk services and housing for their employees, in exchange for temporary tax rebates. The revenue generated post-rebate can be reinvested in local infrastructure projects. Public-Private Partnerships (PPPs): Exploring PPPs and project finance options can provide alternative mechanisms for infrastructure funding, crucial in challenging economic conditions.”

FTLMO2:

“To improve collaboration with the mines, the municipality has implemented several strategies. First, they established quarterly mining forums where

the municipality, community members, and mine representatives, including councillors, discuss and resolve issues related to job recruitment and business opportunities. This forum addresses complaints from the community about limited access to jobs and business contracts with the mines. Additionally, a technical mining forum has been created, focussing on discussions between municipal officials and mine representatives, particularly within the ELD department's mining and industrialisation unit. This forum allows for prediscussions before broader meetings with councillors and stakeholders, ensuring better alignment. Furthermore, the municipality has established a platform where the ELD unit consults with mines before they present their Social and Labour Plan (SLP) projects to the SLP committee. This step helps refine proposals and ensures a smoother process for obtaining endorsement letters. These regular meetings and open communication channels have strengthened the relationship between the municipality and the mines, fostering a collaborative environment.”

FTLMO3:

“To improve the participation of mining companies, the municipality could develop more structured partnership frameworks that clearly define roles, responsibilities, and expectations. Regular dialogue between the municipality, mining companies and community stakeholders can also foster stronger relationships and more sustained collaboration. The municipality can improve collaboration by establishing a dedicated liaison office for road infrastructure projects, streamlined approval processes, and offering joint training sessions on project management and community participation. Developing shared goals and ensuring transparency in project execution are also critical”

FTLM04:

“To improve the role of mining companies, it is essential to establish clear frameworks for collaboration, including well-defined roles and responsibilities for each party. Incentivising companies through tax breaks or recognition programmes could also encourage greater participation.

Furthermore, creating multi-stakeholder platforms that include community representatives, municipal officials, and mining companies can facilitate more transparent and effective decision-making”

FTLM05:

“To improve the role of mining companies in public road infrastructure projects, governments could offer incentives such as expedited regulatory approvals or reduced royalties and taxes. These agreements would encourage companies to invest in infrastructure that benefits both the community and their operations.”

The findings offer a comprehensive overview of the various issues and strategies related to the interaction between the Fetakgomo Tubatse Local Municipality and the mining sector. The analysis underscores critical concerns about revenue generation, road infrastructure financing, community participation, and collaboration between the municipality, mining companies, and local stakeholders.

One of the key issues identified is the impact of the Municipal Property Rights Act (MPRA), which currently limits the municipality's ability to claim revenue from underground properties. This constraint has led to a significant shortfall in potential revenue from mining activities. To address this, the municipality has proposed employing specialists, such as geologists, who could more accurately value and tax mining output, thus increasing fiscal contributions. This challenge of capturing adequate revenue from the mining sector is not unique to Fetakgomo Tubatse; it resonates with the broader legal and technical constraints faced by other mining towns. These limitations, as highlighted in the findings, are further supported of studies such as those by Jiang, Cameron and Yang (2020) that emphasise the need to reform local tax regimes to better reflect the true economic value of mining activities. Such reforms would support the municipality's initiative to reassess tariffs.

In addition, the findings highlight the difficulty in financing road infrastructure projects due to limited municipal revenue. To overcome this challenge, the suggestion of using alternative financing mechanisms, such as Public-Private Partnerships (PPP) or project financing, is proposed as a viable solution. Additionally, the findings reveal significant community discontent with recruitment practices and local business opportunities associated with the mines. Many community members and local

business owners feel excluded from the economic benefits of nearby mining activities. In response, the municipality has established quarterly mining forums to address these concerns, fostering greater engagement and collaboration with affected communities.

These findings align with stakeholder theory, which emphasises the importance of balancing the interests of all parties affected by business activities. The challenges in revenue generation and road infrastructure financing highlight the need for a more inclusive approach where mining companies recognise their broader obligations beyond profit maximisation. Additionally, the establishment of quarterly mining forums reflects a stakeholder-oriented strategy, fostering dialogue and collaboration between the municipality, mining sector, and local communities to ensure more equitable socio-economic benefits.

5.3.6. Best Practice in Collaborations

Participants were asked to derive the best practices that have been happening between the municipality and the mining companies, and also comment on the lessons that they may have learnt concerning the collaboration with the mining companies. They all had different views and perspectives on the best practices, and each and every one of them had a different lesson learnt according to the experiences that they have had. Participants offered the following responses:

FTLMO1:

“Currently, we are involved in a collaborative project with the mines through the Road Agency Limpopo. Both the mines in the R55 corridor and the provincial government contribute equally to the capital for building a significant bridge connecting Jenfers and Steelpoort. Additionally, we are working on a presidential water and sanitation project, a 25-billion-rand initiative. The National Department of Water Affairs, in collaboration with the Treasury, has appointed a Special Purpose Vehicle (SPV) named Redi Ramon Lebaleno to raise 12.5 billion rand from the mines, with the government contributing the remaining amount. This blended financing approach involves the DBSA and private equity players.

From these projects, we have learnt the importance of respecting and observing public-private partnership (PPP) mechanisms. Recent national reforms have aimed to streamline the PPP process by introducing private

sector participation, which accelerates project timelines. Unlike traditional PPPs, which could take three to five years to conclude due to lengthy bureaucratic processes, the new approach allows private sector players to act swiftly, assessing risks, and implementing projects within six to twelve months. A key lesson is the need to consider political risks, as changes in government or leadership can disrupt long-term projects, leading to wasteful expenditure and unmet community expectations. Understanding these factors is crucial for successful collaboration and project delivery.”

FTLMO3:

“While some mining companies have been proactive in contributing to road infrastructure, the extent of their involvement varies. In certain cases, mining companies have successfully partnered with the municipality to upgrade key roads. However, there is room for improvement, particularly in ensuring that their contributions are consistent and aligned with the municipality’s priorities”.

FTLM04:

“Best practice is the establishment of dedicated liaison offices within both the municipality and mining companies to handle all issues related to infrastructure development. This can improve coordination and accountability. Another lesson is the importance of community involvement throughout the project lifecycle to ensure that the infrastructure meets local needs and that the benefits are widely distributed. Finally, incorporating maintenance plans and funding into the initial project agreements can help sustain the infrastructure in the long term.”

FTLM05:

“Best practices for improving future collaborations include ensuring that both mining firms and communities benefit from projects. For example, developing roads that serve local populations while improving access to mining sites encourages mining companies to see the value of their involvement. When the benefits are clear, firms are more willing to invest. Additionally, incentives such as tax breaks, reduced licencing costs, or

expedited permits can encourage mining businesses to participate in road infrastructure projects, as seen in other regions.”

The response above highlights several key aspects of public-private partnerships (PPPs) in infrastructure projects in South Africa, specifically focussing on collaborative efforts between the government and the mining sector. The discussion is centred around two major projects: the construction of a significant bridge linking Jenfers and Steelpoort and a 25-billion-dollar presidential water and sanitation initiative.

The data collected underscore the evolving landscape of PPPs in South Africa, where collaborative efforts between the government and the private sector, particularly the mining industry, play a pivotal role in the development of infrastructure. The emphasis on a blended financing model and streamlined PPP processes reflects a shift toward more efficient and timely project delivery. However, the variability in private sector contributions and the potential political risks pose challenges that need to be addressed to ensure the sustainability and success of these initiatives.

The lessons learnt from these projects highlight the importance of aligning private sector contributions with government priorities, managing political risks, and respecting PPP mechanisms to avoid disruptions and ensure that community expectations are met. These insights could inform future PPPs and contribute to more effective and resilient infrastructure development in South Africa. Additionally, the findings reveal that while some mining companies take proactive steps in the development of road infrastructure, their contributions are not always consistent or aligned with municipal priorities. This observation is consistent with findings from other studies, which highlight the variability in corporate social responsibility (CSR) efforts by mining companies and emphasise the need for better coordination with local government plans (Hilson, 2019).

Stakeholder theory underscores the need for balancing the interests of all parties involved in infrastructure projects, particularly in PPPs where multiple actors, including the government, mining companies, and local communities, have varying expectations. The findings indicate that inconsistencies in private sector contributions and misalignment with municipal priorities can lead to inefficiencies, highlighting the importance of stakeholder engagement in decision-making processes. By fostering stronger collaboration and aligning corporate social responsibility (CSR) initiatives with

local development needs, PPPs can achieve more sustainable outcomes that benefit both businesses and communities.

5.4. Key Findings

- **Disparity in road infrastructure:** The analysis shows a significant difference in road conditions between urban and rural areas, with urban centres generally having better-maintained roads. This disparity is attributed to limited resources and inadequate planning in rural municipalities, which struggle to provide basic services such as roads, stormwater systems, water, sanitation, and electricity. Despite improvements in some areas, the overall state of the road infrastructure remains mixed, with significant challenges still present, especially in rural municipalities. The analysis suggests that while progress has been made since the end of apartheid, considerable backlogs remain, particularly in rural regions.
- **Impact of mining companies:** Mining companies are seen as essential partners in the development of infrastructure, especially in rural areas near their operations. These companies contribute to local development through financial support, technical expertise, and manpower, often as part of their social and Labour Plan (SLP) commitments. However, the benefits of these contributions are geographically limited to areas within a 20-kilometer radius of the mines, which could leave other communities underserved.
- **Challenges of Private-Public Partnerships** Although collaboration between municipalities and mining companies is necessary due to the scarce public resources, it can be contentious. Issues such as the long-term sustainability of these partnerships and the limited scope of their contributions are highlighted as areas of concern. This geographic limitation could contribute to service delivery disparities and dissatisfaction between communities outside the target areas.
- **Corporate Social Responsibility (CSR):** Mining companies' contributions, such as building schools and roads, are often viewed as part of their CSR. However, there are complaints that the focus on areas immediately surrounding mining operations neglects broader regional development needs, which can lead to tensions between companies and local communities.

- **Limited Regional Impact:** The focus on areas close to mining operations means that broader regional development may be neglected, resulting in persistent infrastructure challenges in rural areas. This limitation in the mining companies' contributions raises concerns about whether they are truly addressing the need of the wider community.
- **Environmental and Resource Allocation Challenges:** Seasonal flooding and other environmental factors exacerbate road infrastructure challenges, especially in municipalities with limited resources for infrastructure resilience. Furthermore, the analysis points to difficulties in distributing limited resources across various communities, a common issue in developing areas where demand for services often exceeds municipal capacity.
- **Impact of Protests and Planning Deficiencies:** Ongoing service delivery protests are identified as a major disruptive factor, delaying infrastructure projects and increasing costs. Furthermore, the lack of long-term planning, such as 10- to 20-year development plans, is highlighted as a critical issue, with poor planning leading to missed opportunities to secure funding and implementing projects.

5.5. Conclusion

The chapter presented the findings as provided by the five respondents that were interviewed. These findings were analysed by the researcher and supported by the relevant literature. From the analysis, the findings were derived, in which the summary of findings is included at the end of the chapter. The next chapter is the summary of findings, conclusion, and recommendations chapter.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

In the previous chapter, data analysis and study findings were presented. This current chapter discusses the summary of all chapters. In addition, the recommendations of the study are provided.

6.2. Summary of chapters

6.2.1. Chapter 1

The chapter introduced the study. It provided a clear background on the role of mining companies on road infrastructure, with specific reference to mineral extractive areas. The chapter outlined the problem statement, research questions. The main research objective, which is to determine the role that mining companies are playing on the development of road infrastructure in mineral extraction areas, with reference to the Fetakgomo Tubatse Local Municipality, the other objectives:

- To analyse how mining companies through their social and Labour Plans are able to contribute to the development of road infrastructure.
- To identify the factors that influence the participation of mining companies in the development of the road infrastructure in Fetakgomo Tubatse local municipality.
- Identify challenges facing the mines and Fetakgomo Tubatse municipality in executing road infrastructure development projects.
- Recommend measures that improve collaboration between mining companies and municipalities in mineral extraction areas.

The chapter also explained concepts that are used in the study, such as international relations, local governance, and local government. The delineation of the study chapters was also included in Chapter 1. The chapter also indicated what contribution the study will make.

6.2.2. Chapter 2

Chapter 2 explored key theories and frameworks, starting with stakeholder theory, which emphasises the significance of considering all individuals or groups affected by an organisation's objectives, beyond just shareholders. Originating as a strategic

management concept, it contrasts with shareholder theory, which focusses solely on profit maximisation. The stakeholder theory sees profitability as important but not superior to the interests of other stakeholders, advocating a broader organisational responsibility for all parties that affect or are affected by the organisation's goals.

It also delves into the development of Public Administration as a discipline, according to its stages, and how the study can be located in the development of Public Administration. The chapter also elaborated on the importance of conceptual frameworks in research, noting that they help organise and visually represent relationships between key study variables, guiding the research process in a structured way.

6.2.3. Chapter 3

Chapter 3 discussed the development of the road infrastructure in mineral extraction areas. It began by explaining the term road infrastructure using the funnel approach. Then it looked at the road infrastructure development in a South African context. A discussion of the overview of the municipal road infrastructure in South Africa and the state in which the municipal road infrastructure is in. The chapter also discuss the historical impact of mining companies on South Africa's municipal infrastructure, as well as the evolving role these mines play or could play in advancing infrastructure development within communities. Some case studies were discussed in which the mining companies been involved in road infrastructure development; these include Anglo American mine, the mine in Rustenburg. The chapter also looked at the state of road infrastructure in some of the mineral extraction areas, which include Emalahleni Local Municipality, Rustenburg Local Municipality, and Limpopo province.

6.2.4. Chapter 4

Chapter 4 provided a discussion with the methodology of the study. It explained the navigation of the study as it provided the ways in which questions were answered and how data was collected. The chapter included the purpose and characteristics of research and explained the research methodology and the qualitative research design in this chapter, qualitative research as a chosen study method was unpacked, the justification for using qualitative research and interviews were dealt with. The difference between qualitative and quantitative research was discussed. Sampling was also discussed in this chapter. The use of purposive sampling in the study was

clarified. The validity and reliability of the study and their relationships were provided. Furthermore, the ethical considerations and limitations of the study were unpacked. And then the data collection process was thoroughly explained. Lastly, the objective of this chapter was to clarify how the research was conducted.

6.2.5. Chapter 5

Chapter 5 discussed data analysis and findings of the study. It began by asking the following questions as part of trying to answer them:

- How are mining companies, through their Social Labour Plans (SLPs), able to contribute to the road infrastructure?
- What are the factors that influence the participation of mining companies in the development of road infrastructure in Fetakgomo Tubatse local municipality?
- What are the challenges faced by the mines and Fetakgomo Tubatse municipality in implementing road infrastructure projects?
- What measures can be recommended to improve the role of mining companies in the development of road infrastructure in mineral extraction areas such as Fetakgomo Tubatse?

After these questions, data analysis proceeded with its processes. The recordings of the interviews were transcribed. The findings of the study were mentioned.

6.2.6. chapter 6

This is the last chapter of the study. The chapter summarises all the chapters, recounting that the questions of the study are answered, and the objectives met. The chapter then provided the recommendations of the study. This chapter also proposes that other studies can be done to further contribute to the body of knowledge.

6.3. SUMMARY OF HOW THE OBJECTIVES WERE ADDRESSED

6.3.1. To analyse how mining companies through their social and Labour Plans are able to contribute to the development of road infrastructure.

The study used a qualitative approach, utilising interviews as the primary method of data collection. As detailed in the findings from the previous chapter, mining companies, through their Social and Labour Plans (SLPs), were revealed to play a pivotal role in addressing road infrastructure backlogs within the Fetakgomo Tubatse

Local Municipality (FTLM). These companies not only provide financial resources, but also offer technical expertise, helping the municipality in alleviating critical service delivery challenges, particularly in areas adjacent to their mining operations. The contributions of these companies have been instrumental in improving road infrastructure, making it more accessible and durable for communities directly affected by mining activities.

However, there are notable limitations to the scope of these contributions. The assistance offered by mining companies is often confined to a 20-kilometer radius surrounding their operations. This geographical restriction has had unintended consequences, particularly by deepening the gap between well-served urban centres and more neglected rural areas. Communities further from mining sites often experience inadequate road infrastructure, leaving them underserved and further establishing existing inequalities between rural and urban regions within the municipality. Consequently, while the efforts of mining companies are valuable, their limited range of support contributes to uneven development, hindering further improvements in outlying areas.

6.3.2. To identify the factors that influence the participation of mining companies in the development of the road infrastructure in Fetakgomo Tubatse local municipality.

The study employed a qualitative approach, gathering data through interviews to explore the factors driving mining companies' involvement in road infrastructure development. It was revealed that this participation is primarily shaped by regulatory requirements under the Mineral and Petroleum Resources Development Act (MPRDA) and the companies' corporate social responsibility (CSR) mandates. According to the MPRDA, mining companies are required to contribute to the socioeconomic development of the areas in which they operate, and road infrastructure is one of the critical sectors that align with these obligations. In addition to complying with regulatory frameworks, companies are also motivated by operational benefits. Improved road infrastructure reduces transportation costs and improves logistics, providing a direct economic advantage for their operations. However, the study noted that, although these legal and strategic factors foster collaboration between the Fetakgomo Tubatse Local Municipality (FTLM) and mining companies, the participation of extent of the mining companies remains confined to their immediate operational priorities. The

focus is often on addressing infrastructure needs that directly impact mining activities, such as ensuring smoother transportation of minerals, rather than on larger community development projects. This highlights a narrow utilitarian scope of participation, despite the potential for broader, long-term social impacts that could arise from more comprehensive infrastructure development.

6.2.3. Identify the challenges faced by the mines and Fetakgomo Tubatse municipality in executing road infrastructure development projects

The study, using a qualitative approach and interviews for data collection, revealed several significant challenges that the municipality faces in executing road infrastructure projects. One of the most prominent challenges is inadequate funding. The municipality faces chronic financial shortfalls, largely due to low revenue generation from taxes, which is especially problematic in rural areas where economic activity is limited, and unemployment rates are high. These social factors severely constrain the municipality's ability to mobilise sufficient resources for infrastructure development. Furthermore, municipal budget allocations are often unpredictable, making it difficult for local authorities to plan long-term infrastructure projects with certainty.

In addition to financial constraints, the municipality also struggles with a lack of technical expertise. The limited availability of skilled professionals within the municipal workforce makes it challenging to efficiently design, implement and maintain road infrastructure projects. This deficiency often requires the outsourcing of key tasks, which not only drives up project costs but also introduces delays and inefficiencies into the planning and execution processes. Bureaucratic delays further exacerbate these issues, as lengthy administrative procedures, coupled with poor coordination between different government departments, slow down the approval and initiation of infrastructure projects.

Environmental factors, such as flooding, present another obstacle. Flooding, particularly in rural and low-lying areas, often damages existing infrastructure and complicates construction efforts. These environmental risks require additional planning and investment in resilient infrastructure, which the municipality may not always be able to afford. Together, these financial, technical, bureaucratic and environmental challenges create significant barriers to the effective execution of road

infrastructure projects, limiting the municipality's capacity to address immediate needs and long-term development goals.

6.2.4. Collaboration Challenges between Mining Companies and the Municipality

The study utilised a qualitative approach, relying on interviews to gather insights into the dynamics of mining contributions to infrastructure development within the municipality. Although there exists a regulatory framework that encourages collaboration between mining companies and local governments, the research revealed a significant misalignment between the contributions of mining companies and the broader infrastructure priorities of the municipality. Mining companies often focus their investments on projects that serve their immediate operational needs, rather than aligning with the long-term development goals outlined by the municipality. This disconnect can undermine the potential impact of these contributions on the community's overall development.

Public-private partnerships (PPPs) have played a critical role in facilitating collaboration and, when effectively coordinated, they offer the potential to bridge the gap between private sector resources and public sector needs. However, the study identified a variety of coordination issues that often hinder the success of these partnerships. Poor communication, lack of transparency, and differing priorities between stakeholders often lead to inconsistencies in project execution. These challenges result in projects that either fail to meet their intended goals or are significantly delayed, thus diminishing the benefits of PPPs.

Additionally, the study highlighted protests that occurred as a result of poor or lack of service delivery, driven by widespread dissatisfaction with the performance of the local government, have further exacerbated these challenges. These protests often result in the disruption of ongoing infrastructure projects, leading to increased costs and extended delays in completion. The combination of regulatory misalignment, coordination difficulties within PPPs, and community unrest complicates the process of delivering sustainable infrastructure, presenting a multilayered challenge for both the municipality and mining companies in fostering effective collaboration.

6.2.5. Long-Term Impact of Mining Companies' Contributions

The study used a qualitative approach, utilising interviews as the primary data collection to understand the dynamics of mining companies' participation in road infrastructure development within the Fetakgomo Tubatse Local Municipality (FTLM). Although mining companies play a significant role in funding and supporting road infrastructure projects in the region, there are concerns about the sustainability of this involvement. The dependency on mining companies for these infrastructure investments raises questions about the long-term benefits, particularly as many of these companies operate with finite resources and limited operational timelines. As mining operations approach their end-of-life phase, the funding streams that currently support road infrastructure could diminish or disappear entirely, leaving the municipality vulnerable to deterioration of essential infrastructure.

The potential loss of this funding poses a significant risk to the municipality, as it may not have the financial capacity or alternative sources of revenue to maintain and develop roads once the mining companies scale down or cease operations. This could lead to infrastructure degradation, negatively impacting transportation, local economies, and overall community well-being. The study highlights the urgent need for the municipality to explore alternative and sustainable funding mechanisms to ensure the maintenance of road infrastructure beyond the lifecycle of mining operations. Without proactive planning and diversification of funding sources, FTLM faces a future where its road infrastructure may fall into disrepair, affecting not only the local economy, but also the greater regional connectivity and development. This finding underscores the importance of creating long-term infrastructure strategies that are not solely reliant on the presence of mining companies, to protect against potential funding gaps.

6.3. Recommendations

The summary of key findings of the study were as follows:

- There is disparity in road infrastructure development.
- There are challenges when it comes to the Public Private Partnerships.
- There is limited regional impact of the mines.
- Environmental factors such as floods negatively affect road conditions.
- Impact of protests and planning deficiencies.

From these findings, the recommendations proffered by the researcher are explained below.

6.3.1. Addressing Road Infrastructure Gaps

To reduce the disparity between urban and rural road infrastructure, FTLM should prioritise rural development in its integrated development plan (IDP). The municipality should seek additional funding from national government grants and other finance institutions. A thorough infrastructure audit would help target areas in critical need of intervention.

6.3.2. Extending the Contributions of Mining Companies Beyond the 20-Kilometer Radius

The local government should engage with mining companies to expand their involvement in road infrastructure beyond the 20-kilometer radius. This could be done through new public-private partnerships (PPPs) designed to co-finance road development in underserved regions, addressing the identified regional inequalities.

6.3.3. Enhancing mining-municipality collaboration, through improvement of Public-Private Partnership frameworks.

To improve coordination, the FTLM should establish a dedicated task force or steering committee composed of representatives from both the mining sector and the municipality. Regular feedback from community stakeholders should also be incorporated into the decision-making process to ensure that road development projects align with local socioeconomic needs. To maximise the benefits of PPPs, the municipality should adopt clearer frameworks that define the roles and responsibilities of all stakeholders involved in infrastructure development. This can include tax incentives for mining companies, streamlined regulatory processes, and formalised contribution structures to ensure alignment with municipal priorities.

6.3.3. Building Municipal Capacity for Infrastructure Management

Capacity-building initiatives are essential to ensure the long-term sustainability of road infrastructure projects. Mining companies could support this by offering training programmes or contract opportunities for municipal staff as part of their CSR initiatives. This would equip the municipality with the technical skills needed for effective project management.

6.3.4. Long-term planning for sustainable development

FTLM should develop a long-term infrastructure plan that ensures continued road development even after mining operations cease. Engaging with national and provincial governments in this planning process can help secure additional resources and ensure that mining contributions are used in a way that supports sustainable development.

6.3.6. Incorporating Environmental Resilience into Infrastructure Projects

Given the challenges posed by environmental factors such as seasonal flooding, FTLM should incorporate climate resilience measures in its road infrastructure projects. Collaborating with environmental experts and accessing climate resilience funding from national and international sources will help mitigate the long-term impacts of climate change on road infrastructure.

6.4. Limitations of the study

- **Limited access to Primary Data:** the mines which the researcher sent letters to requesting permission to collect data did not give positive feedback (did not grant the permission). The inability to conduct interviews with representatives of the selected mining companies restricted the study's access to first-hand information.
- **Reliance on Secondary Data:** the researcher had to use the SLPs for the mining companies' data, which are secondary data. This may have led to information gaps or reliance on potentially outdated or incomplete data, affecting the completeness of the findings.
- **Time constraints:** The researcher experienced time constraints, particularly because the masters degree they registered for was for a one-year period, therefore this research study had to be done in one year.

6.5. Recommendations for further research

The relationship between the municipality and the companies operating in its vicinity is very imperative. This can only be achieved if these two have a good working relationship with each other. The primary focus of this study was the local municipality of Fetakgomo Tubatse and selected mines (four). The mines need to forge a good working relationship with the municipalities, so they will not be reluctant to engage in research relating to how do they contribute to the infrastructure development of the

municipalities in which they are in. An additional recommendation for future research is to adopt a strategic approach to engage with the mining companies. Researchers could leverage the role of community liaison officers, who are elected by community members to serve as intermediaries between the community and the mining companies. These officers may facilitate access to the mines by serving as a trusted link.

Furthermore, it is essential for future studies to incorporate the perspectives of community members. As the primary stakeholders directly affected by the inadequacies in road infrastructure, their insights and lived experiences could provide valuable context and depth to the research. This inclusive approach not only enriches the findings but also ensures that the study addresses the concerns of those most impacted by the issue.

6.6. Conclusion

The purpose of this chapter was to discuss the summary of findings and recommendations. In this regard, the chapter began by discussing the summary of chapters, followed by how the objectives were addressed. Secondly, the recommendations were discussed. Thirdly, the limitations of the study were indicated. And lastly, the recommendation for further research were put forward.

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ANNEXTURE A: INTERVIEW GUIDE FOR MUNICIPAL OFFICIALS

Demographics information

1. Gender
2. Qualification
3. How long have you been in your current office?

Objective one: Role of Mining Companies in Road Infrastructure Development:

1. In your view, what is the state of road infrastructure development in the municipality?
2. What type of road networks is the municipality responsible for?
3. What do you think is the role that that can be played by the mining companies to help with the backlog of the road infrastructure development?
4. To what extent are mining companies effectively playing this role?
5. Can you share any successful examples of collaboration between the municipality and mining companies in road infrastructure development?

Objective two: Factors Influencing Mining Companies' Involvement

1. What factors encourage mining companies to participate in road infrastructure development projects?
2. Are there any regulatory or policy incentives that influence their involvement?
3. How do economic factors, such as mineral prices, affect the willingness of mining companies to invest in infrastructure development?

Objective three: Challenges Faced by the Municipality:

1. What are the main challenges faced by the Fetakgomo Tubatse municipality in municipal infrastructure development projects?
2. How do these challenges impact the municipality's ability to collaborate effectively with mining companies?
3. Are there any specific challenges related to road infrastructure development that you would like to highlight?

Objective four: Recommendations for Improvement:

1. Based on your experience, what measures can be taken to enhance the role of mining companies in public infrastructure projects in mining communities?

2. How can the municipality improve its collaboration with mining companies to address infrastructure development challenges?
3. Are there any best practices or lessons learned that can be applied to improve possible future collaborations?

ANNEXTURE B: INTERVIEW GUIDE FOR MINES EXECUTIVES

Demographics information

1. Gender
2. Educational level
3. How long have you been in your current office?

Objective one: Role of Mining Companies in Road Infrastructure Development:

1. In your view, what is the state of road infrastructure in the municipality?
2. What is the role that the mining company is playing to help with the municipal road infrastructure development?
3. Are there any road infrastructure development projects that the mining company has initiated in the municipality?
4. What motivates your company to participate in such projects?
5. Can you share any successful examples of collaboration between the municipality and mining companies in road infrastructure development?

Objective two: Factors Influencing Mining Companies' Involvement

1. What factors influence your company's decision to invest in road infrastructure development projects in mining communities?
2. Are there any regulatory or policy factors that affect your company's participation in such projects?
3. How do economic considerations, such as mineral prices, impact your company's willingness to invest in infrastructure development?

Objective three: Challenges Faced by the Mines

1. From your perspective, what are the main challenges faced by the mines in road infrastructure development projects?
2. How do these challenges affect the mines ability to collaborate effectively with the municipality?
3. Are there any specific challenges related to road infrastructure development that you have encountered?

Objective four: Recommendations for Improvement

1. Based on your experience, what measures can be taken to improve the role of mining companies in public infrastructure projects in mining communities?
2. How can the municipality enhance its collaboration with mining companies to address infrastructure development challenges?
3. Are there any successful strategies or approaches that you recommend for improving future collaborations?

ANNEXTURE C: ETHICAL CLEARANCE



UNIVERSITY OF
MPUMALANGA

Ref: UMP/Moyo/07/2024

Date: 10 July 2024

Marcia Veronica Moyo (201954370)

School of Development Studies

FACULTY OF ECONOMICS, DEVELOPMENT AND BUSINESS SCIENCES

University of Mpumalanga

RE: APPROVAL FOR ETHICAL CLEARANCE FOR THE STUDY:

The Role of Mining Companies on Road Infrastructure Development in Mineral Extraction Areas: A case study of Selected mines within Fetakgomo-Tubatse Local Municipality

Reference is made to the above heading.

The Chairperson, on behalf of the Faculty Research Ethics Committee (Faculty of Economics, Development and Business Sciences) UMP, approved the ethical clearance of the above-mentioned study.

Any alteration/s to the approved research protocol i.e., Title of the Project, Location of the Study, Research Approach, and Methods must be reviewed and approved through the amendment/ modification prior to its implementation.

PLEASE NOTE: Research data should be stored securely in the school/division for a period of 5 years.

The Ethical Clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter, Recertification must be applied for on an annual basis.

A handwritten signature in black ink, appearing to read 'Prof. Ogujiuba Kanayo'.

Prof. Ogujiuba Kanayo

Chairperson: FREC,

Faculty of Economics, Development and Business Sciences

University of Mpumalanga

ANNEXTURE D: INFORMATION LEAFLET



INFORMATION LEAFLET

Researcher: Marcia Moyo (201954370)

Supervisor:

Name: Dr Rasodi Manyaka

Telephone: 013 002 0361

E-mail address: Rasodi.manyaka@ump.ac.za

Dear Potential Research Participant,

I am, Moyo Marcia, a Master of Public Administration student at the University of Mpumalanga, in the school of Development studies, Faculty of Economic, Development and Business Sciences. You are invited to participate in a research project titled **THE ROLE OF MINING COMPANIES ON ROAD INFRASTRUCTURE DEVELOPMENT IN MINERAL EXTRACTION AREAS: A CASE STUDY OF SELECTED MINES WITHIN FETAKGOMO-TUBATSE LOCAL MUNICIPALITY**

Give the specific research objectives

1. To examine the role of mining companies in road infrastructure development in mineral extraction municipalities such as Fetakgomo Tubatse local municipality.
2. To identify the factors influencing the involvement of mining companies in road infrastructure development in Fetakgomo Tubatse local municipality.
3. To identify challenges faced by the Fetakgomo Tubatse municipality in executing municipal infrastructure development projects.
4. To recommend measures enhancing collaboration between mining companies and municipalities in mineral extraction areas.

If you decide to take part in the study, you will be required to do the following:

- Sign this informed consent form
- Indicate what participants are required to do for your specific research project:

1. Participate in a face to face interview in which a few questions will be asked

The questions are strictly for the purpose of this research study. Please note that your participation in answering this interview questions is completely voluntary and you are allowed to withdraw any time should you wish to. Your name will not be recorded anywhere and no one will be able to connect you to the answers you give. Your answers will be given a code number or a pseudonym and you will be referred to in this way during data analysis and discussion of results in the research report. All responses will be summed together as a group with other respondents with no reference to individuals. This research is strictly for educational or academic purposes.

Your co-operation and participation in the study will be greatly appreciated. Please sign the informed consent below if you agree to participate in the study.

Kindly, answer each question honestly and accurately as your participation in this process is essential to the success of this study.

Yours faithfully

Moyo MV

Signature

Marcia Moyo

ANNEXTURE E: CONSENT FORM

CONSENT FORM

1. I _____ agree to and am voluntarily taking part in this research project.
2. I understand that I have the right to withdraw from the study at any time and may choose no longer to participate without having to explain myself.
3. I am aware that the information I provide on the questionnaire is for educational / academic purposes.
4. I understand that my name will not be recorded.
5. I have been provided with, have read, the information leaflet regarding this research study.
6. I have had the opportunity to ask any questions related to this study, and received satisfactory answers to my questions, and any additional details I wanted.
7. I agree to answer the questions to the best of my ability.
8. I understand that I may refuse to answer any questions that I do not feel comfortable answering.
9. By signing this letter, I give free and informed consent to participate in this research study.

DATE			
PARTICIPANT SIGNATURE			
RESEARCHER NAME	Marcia Moyo	RESEARCHER SIGNATURE	M. Moyo

This research is being conducted by Marcia Moyo.

Telephone: 072 832 4159

E-mail: 201954370@ump.ac.za

If there are any further questions about the research study or the questions itself, please contact the Supervisor (Dr Rasodi Manyaka) at UMP. The Supervisor's contact details are as follows:

Supervisor

Tel: 063 711 1173

Email: Rasodi.manyaka@ump.ac.za

This research project has received ethical approval from the School Research Ethics Committee / Faculty Research Ethics Committee / UMP Research Ethics Committee for Human and Social Sciences.

ANNEXTURE F: LETTER TO REQUEST PERMISSION TO CONDUCT RESEARCH FROM THE MUNICIPALITY



Private Bag X11283, Mbombela 1200, South Africa, Tel: (013) 002 0232

1 Kastania Street,
Burgersfort

Dear Mr. M.J. Makgata

Request to conduct research

In partial fulfilment of the requirements for the Masters degree in Public Administration, our students are expected to complete a research project. In this regard, we are kindly requesting permission for Miss **Marcia Veronica Moyo (201954370)** to conduct her project in Fetakgomo-Tubatse Local Municipality. The title of the project is:

THE ROLE OF MINING COMPANIES ON ROAD INFRASTRUCTURE DEVELOPMENT IN MINERAL EXTRACTION AREAS: A CASE STUDY OF SELECTED MINES WITHIN FETAKGOMO-TUBATSE LOCAL MUNICIPALITY

Employees who are willing to participate, will be interviewed at an agreed time.

We would like to make it clear that the project is solely for academic purposes, and the employees who will participate in the project will remain anonymous. The project will be guided by the University of Mpumalanga's ethics policy, together with the POPI Act in ensuring that personal information is kept private. Accordingly, details of the project will not be publicized without consent or permission from the municipality.

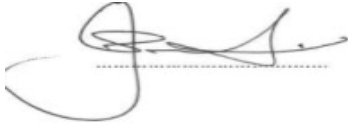
A copy of the completed feedback report will be available to you on request. For further details please contact the undersigned.

Your approval will be greatly appreciated.

Kind regards

Supervisor's Signature

Date:10 May 2024

A handwritten signature in black ink, appearing to be 'R.K. Manyaka', written over a horizontal line.

Supervisor's Name: Dr R.K Manyaka

Cell number: 063 711 1173

Work telephone number: 013 002 0361

E-mail: Rasodi.manyaka@ump.ac.za

ANNEXTURE G: PERMISSION LETTER FROM THE MUNICIPALITY



FETAKGOMO TUBATSE LOCAL MUNICIPALITY

Enquiries: Komane TT (013)231-1000

25 July 2024

Ms Moyo M.V
Student No: 201954370
University of Mpumalanga

Dear Ms Moyo M.V

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH STUDY, TITLED: THE ROLE OF MINING COMPANIES ON ROAD INFRASTRUCTURE DEVELOPMENT IN MINERAL EXTRACTIVE AREAS: A CASE STUDY OF SELECTED MINES WITHIN FETAKGOMO TUBATSE LOCAL MUNICIPALITY.

The above subject matter bears reference.

The Municipality hereby acknowledges receipt of your letter dated 10th May 2024, through which you requested to conduct a research study within the structures of Fetakgomo Tubatse Local Municipality, for the purposes of partially fulfilling your academic requirements.

Your request for permission to conduct study research within the structures of the municipality has been approved, this is for the purposes of finalizing your qualification: Master's Degree in Public Administration registered at the University of Mpumalanga. Your Research Study is based on the Research Title: *"The role of mining companies on road infrastructure development in mineral extractive areas: A case study of selected mines within Fetakgomo Tubatse Local Municipality"*

The municipal contact department will be Corporate and Shared Services (HRMTD Unit) to be contacted on 013 231 1000 or any department within the municipality depending on the requirements of your academic research.

It is further requested that the Municipality be provided with a copy of the research study conducted for future reference purposes.

Wishing you well and hope your academic research findings will provide solutions to the challenges pertaining to Road Infrastructure Development in Mineral Extractive Areas.

Kind regards,


Makgata M.J
Municipal Manager


Date

HEAD OFFICE

Katshola Street | P.O. Box 206, Burgersfort, 1150
Tel: +27 15 231 1000 | Fax: +27 15 231 7467

REGIONAL OFFICE

Stand No. 1, Mashung, Co-Nkomo | P.O. Box 518, Apel, 0739
Tel: +27 15 622 8000 | FAX: +27 15 622 8026

ANNEXTURE H: LETTER TO REQUEST PERMISSION TO CONDUCT RESEARCH FROM MINE A



Private Bag X11283, Mbombela 1200, South Africa, Tel: (013) 002 0232

Bokoni Platinum Mine
Off r37 Atok
Polokwane
0749

Dear sir/madam

Request to conduct research

In partial fulfilment of the requirements for the Masters degree in Public Administration, our students are expected to complete a research project. In this regard, we are kindly requesting permission for Miss **Marcia Veronica Moyo (201954370)** to conduct her project in your organisation. The title of the project is:

THE ROLE OF MINING COMPANIES ON ROAD INFRASTRUCTURE DEVELOPMENT IN MINERAL EXTRACTION AREAS: A CASE STUDY OF SELECTED MINES WITHIN FETAKGOMO-TUBATSE LOCAL MUNICIPALITY

Employees who are willing to participate, will be interviewed online on Microsoft teams at an agreed date and time.

We would like to make it clear that the project is solely for academic purposes, and the company's name or the employees who will participate in the project will remain anonymous. The project will be guided by the University of Mpumalanga's ethics policy, together with the POPI Act in ensuring that personal information is kept private. Accordingly, details of the project will not be publicized without consent or permission from the company.

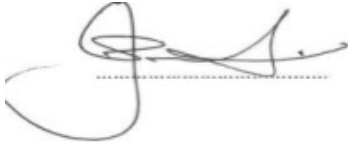
A copy of the completed feedback report will be available to you on request. For further details please contact the undersigned.

Your approval will be greatly appreciated.

Kind regards

Supervisor's Signature

Date: 10/05/2024

A handwritten signature in black ink, appearing to be 'R.K. Manyaka', written over a horizontal line.

Supervisor's Name

Dr R.K. Manyaka

Cell number: 063 711 1173

Work telephone number: 013 002 0361

E-mail: Rasodi.manyaka@ump.ac.za

ANNEXTURE I: LETTER TO REQUEST PERMISSION TO CONDUCT RESEARCH FROM MINE B



Private Bag X11283, Mbombela 1200, South Africa, Tel: (013)
002 0232

Dwarsrivier Chrome Mine
Dwarsrivier Farm 372 KT
Steelpoort District
Limpopo

Dear sir/madam

Request to conduct research

In partial fulfilment of the requirements for the Masters degree in Public Administration, our students are expected to complete a research project. In this regard, we are kindly requesting permission for Miss **Marcia Veronica Moyo (201954370)** to conduct her project in your organisation. The title of the project is:

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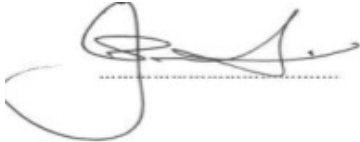
A copy of the completed feedback report will be available to you on request. For further details please contact the undersigned.

Your approval will be greatly appreciated.

Kind regards

Supervisor's Signature

Date: 10/05/2024

A handwritten signature in black ink, appearing to be 'R.K. Manyaka', written over a horizontal line.

Supervisor's Name

Dr R.K. Manyaka

Cell number: 063 711 1173

Work telephone number: 013 002 0361

E-mail: Rasodi.manyaka@ump.ac.za

ANNEXTURE J: LETTER TO REQUEST PERMISSION TO CONDUCT RESEARCH FROM MINE C



Private Bag X11283, Mbombela 1200, South Africa, Tel: (013) 002 0232

Modikwa Platinum Mine
292KT Onverwacht
Driekop
1129

Dear sir/madam

Request to conduct research

In partial fulfilment of the requirements for the Masters degree in Public Administration, our students are expected to complete a research project. In this regard, we are kindly requesting permission for Miss **Marcia Veronica Moyo (201954370)** to conduct her project in your organisation. The title of the project is:

THE ROLE OF MINING COMPANIES ON ROAD INFRASTRUCTURE DEVELOPMENT IN MINERAL EXTRACTION AREAS: A CASE STUDY OF SELECTED MINES WITHIN FETAKGOMO-TUBATSE LOCAL MUNICIPALITY

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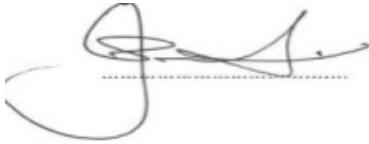
A copy of the completed feedback report will be available to you on request. For further details please contact the undersigned.

Your approval will be greatly appreciated.

Kind regards

Supervisor's Signature

Date: 10/05/2024

A handwritten signature in black ink, appearing to be 'R.K. Manyaka', written over a horizontal line.

Supervisor's Name

Dr R.K. Manyaka

Cell number: 063 711 1173

Work telephone number: 013 002 0361

E-mail: Rasodi.manyaka@ump.ac.za

ANNEXTURE K: LETTER TO REQUEST PERMISSION TO CONDUCT RESEARCH FROM MINE D



Private Bag X11283, Mbombela 1200, South Africa, Tel: (013)
002 0232

Two Rivers Platinum mine
372 Kay Dwarsrivier Farm
Burgersfort
1120

Dear sir/madam

Request to conduct research

In partial fulfilment of the requirements for the Masters degree in Public Administration, our students are expected to complete a research project. In this regard, we are kindly requesting permission for Miss **Marcia Veronica Moyo (201954370)** to conduct her project in your organisation. The title of the project is:

THE ROLE OF MINING COMPANIES ON ROAD INFRASTRUCTURE DEVELOPMENT IN MINERAL EXTRACTION AREAS: A CASE STUDY OF SELECTED MINES WITHIN FETAKGOMO-TUBATSE LOCAL MUNICIPALITY

Employees who are willing to participate, will be interviewed online on Microsoft teams at an agreed date and time.

We would like to make it clear that the project is solely for academic purposes, and the company's name or the employees who will participate in the project will remain anonymous. The project will be guided by the University of Mpumalanga's ethics policy, together with the POPI Act in ensuring that personal information is kept private. Accordingly, details of the project will not be publicized without consent or permission from the company.

A copy of the completed feedback report will be available to you on request. For further details please contact the undersigned.

Your approval will be greatly appreciated.

Kind regards

Supervisor's Signature

Date: 10 May 2024

A handwritten signature in black ink, appearing to be 'R.K. Manyaka', written over a horizontal dotted line.

Supervisor's Name

Dr R.K. Manyaka

Cell number: 063 711 1173

Work telephone number: 013 002 0361

E-mail: Rasodi.manyaka@ump.ac.za

ANNEXTURE L: LANGUAGE EDITING CERTIFICATE

Proof of Editing Dr. Nelson S. Ratau

Writer and English & Literary Studies Lecturer

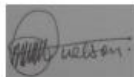
29 Waterberry, 45 Graniet St
West Acres, Nelspruit
Cell: 0767091860
Email: Nelson.Ratau@ump.ac.za

04 November 2024

TO WHOM IT MAY CONCERN

This letter serves to certify that I have conducted proofreading and language editing of a master's dissertation titled: *The role of mining companies in road infrastructure development in mineral extraction areas: a case study of selected mines within Fetakgomo-Tubatse Local Municipality* by Marcia Veronica Moyo (201954370). To my knowledge, the work has been edited. Unless tampered with prior to your reception of the edited work, I trust you will find the editing quality in order.

Regards



Dr. NS Ratau (Editor)

ANNEXTURE M: TURNIT IN REPORT

Research report draft copy Moyo MV			
ORIGINALITY REPORT			
4%	4%	1%	4%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS
PRIMARY SOURCES			
1	researchspace.ukzn.ac.za Internet Source	2%	
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3	Submitted to Stadio Holdings Student Paper	<1%	
4	Submitted to University of KwaZulu-Natal Student Paper	<1%	
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12	Submitted to Singapore Institute of Technology Student Paper	<1%	
13	vital.seals.ac.za:8080 Internet Source	<1%	
14	repository.nwu.ac.za Internet Source	<1%	
15	Submitted to University of the Free State Student Paper	<1%	
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