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A CRITICAL INVESTIGATION INTO THE CREATION OF SPECIAL ECONOMIC ZONES IN SOUTH AFRICAN MINING AREAS

Maureen Phambane (362760)

A research report submitted to the Faculty of Engineering and Built Environment, University of the Witwatersrand, Johannesburg in partial fulfilment of the requirement for the degree of Master of Science in Engineering.

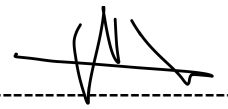
JOHANNESBURG, 2024

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Abstract

The Bushveld Complex (BC) hosts the largest known deposits of platinum group metals (PGM) bearing ore in the world, divided into the Eastern Limb, Western Limb and Northern Limb. The three largest PGM producers include Sibanye Stillwater, Impala Platinum and Anglo-American Platinum and they have operations spread around the BC. With this endowment, the opportunity exists for South Africa to not only be just a producer country and exporter of the PGM but also be involved in several secondary and tertiary PGM activities by establishing business clusters around mining areas.

The objectives of this research study were to assess the nature of the local Special Economic Zones (SEZ) landscape, including a detailed overview of the Bojanala and Fetakgomo-Tubatse SEZs on the western and eastern limbs respectively, and to develop a viability matrix to assess which of the two SEZs, namely Bojanala and Fetakgomo-Tubatse, is likely to succeed based on the socio-economic profile, sector analysis, education level and spatial linkages. The research sought to answer whether the Special Economic Zone model implemented in South Africa is adequate to enable successful SEZ operation in the BC and whether the current spatial linkages in the BC are sufficient to support the existence of a PGM SEZ.

The research design is a case study, and the qualitative research methodology was chosen as the most appropriate. The data used involved desktop study from research papers, books, journal articles, conference papers, documents from government agencies, websites, annual reports, news articles, web blogs and published statistics from research organisations. A thematic analysis was used to interpret the literature reviews, case studies, and other secondary data cited in the study.

The results indicated that the Fetakgomo-Tubatse SEZ has a high viable potential to succeed as an SEZ because it scored higher in the viability matrix, even though it scored lower on the spatial linkages and sector analysis. The likelihood of success of the Fetakgomo-Tubatse SEZ over the Bojanala SEZ was mainly driven by the value proposition offered and the regional education level assessment where it was found that the Fetakgomo-Tubatse municipality has a bigger population size and a larger

number of people with matric (30% of the population) and post-matric (4% of the population) qualifications. That is, it is likely to provide local labour with the qualifications and skills required in the SEZ.

Furthermore, both SEZs have been successful in acquiring funding from companies that want to locate in the zones, so it could be argued that both of them will be in a position to promote business clustering in the area if the right ingredients such as government intervention, presence of small and medium enterprise, and integration of internal and external markets are in place. The study further supports the view that industrial policies have a role to play in changing and addressing market failures to encourage economic growth. However, these development efforts need to be based on the assessment of the implementation landscape of the SEZ to ensure its success.

Lastly, it is acknowledged that the robustness of this study could be improved by conducting interviews with SEZ operators in South Africa, the Department of Trade, Industry and Competition SEZ Lead, North West Development Corporation (NWDC) and Limpopo Economic Development Agency (LEDA). The NWDC and LEDA are development agencies tasked with the development of the Bojalana and Fetakgomo-Tubatse SEZs respectively. Insights could also be gained by focusing on group discussions and interviewing community leaders, business forums, and traditional leaders in affected regions.

Keywords: South Africa, special economic zones, PGM, mining, Bushveld Complex

For Tshepang and Tsepiso

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Table of Contents

1. INTRODUCTION 1
1.1. Research Background 2
1.2. Research Purpose 7
1.3. Problem Statement 8
1.4. Research Objectives 9
1.5. Research Questions 10
1.6. Structure of the Report 11
2. LITERATURE SURVEY 12
2.1. Introduction 12
2.2. Economic Development 12
2.2.1. The Linear Stages of Growth Model 13
2.2.2. Structural Change Model 13
2.2.3. International Dependence Revolution 14
2.2.4. Neo-classical Free Market Counter Revolution 14
2.3. Economic Development in Perspective 15
2.4. South African Economic Development Policies 17
2.4.1. South African Industrial Policy 20
2.4.2. South African Beneficiation Strategy 24
2.5. Types Of Economic Zones 26
2.5.1. Special Economic Zones 26
2.5.2. Special Economic Zones Related to Mining 33
2.5.3. Policy Instruments for Establishment of SEZs in South Africa 36
2.5.4. Local SEZ Landscape 39
2.6. Chapter Summary 46
3. RESEARCH METHODOLOGY 49
3.1. Introduction 49
3.2. Research Approach 49
3.3. Research Design 50
3.4. Sources Of Data 50
3.5. Data Analysis 51

3.6. Research Limitation....51
3.7. Research Validation....52
3.8. Chapter Summary....52

4. BOJANALA PLATINUM AND FETAKGOMO-TUBATSE SEZ CASE STUDIES 53
4.1. Introduction....53
4.2. Bojanala SEZ Case Study....53
4.2.1. Socio-economic Profile....53
4.2.2. Sector Analysis....57
4.2.3. Spatial Linkages....62
4.3. Fetakgomo-Tubatse SEZ Case Study....64
4.3.1. Socio-economic Profile....64
4.3.2. Sector Analysis....67
4.3.3. Spatial Linkages....71
4.4. Chapter Summary....73

5. DATA ANALYSIS AND DISCUSSION....75
5.1. Introduction....75
5.2. Proposed Viability Matrix....75
5.3. Bojanala Platinum SEZ Analysis....78
5.3.1. Bojanala SEZ Value Proposition Assessment....79
5.3.2. Bojanala SEZ Education Level Assessment....79
5.3.3. Bojanala SEZ Spatial Linkages Assessment....80
5.3.4. Bojanala SEZ Sector Analysis Assessment....80
5.4. Fetakgomo-Tubatse SEZ Analysis....81
5.4.1. Fetakgomo-Tubatse SEZ Value Proposition Assessment....81
5.4.2. Fetakgomo-Tubatse SEZ Education Level Assessment....82
5.4.3. Fetakgomo-Tubatse SEZ Spatial Linkages Assessment....83
5.4.4. Fetakgomo-Tubatse SEZ Sector Analysis Assessment....83
5.5. Discussion....83
5.6. Chapter Summary....85

6. Conclusion and Recommendations....86
6.1. Conclusion....86
6.2. Recommendations....90

7. References 92

List of Figures

Figure 1.1: Industry Growth in Q1 of 2021 Compared to Q4 of 2022 (Statistics South Africa, 2021) 3

Figure 1.2: The geographical location of mines in the Bushveld Complex in South Africa (Minerals Council South Africa, n.d.) 5

Figure 1.3: Location of mines, district municipalities and major national roads in the Bushveld Complex (Sekhukhune District Municipality, 2020) 6

Figure 2.1: South African industrial policy framework 20

Figure 2.2: Transversal focus areas as per the IPAP 2017/18 - 2019/20 (Department of Trade and Industry, 2017) 23

Figure 2.3: Pillars of the South African Beneficiation Strategy (Department of Mineral Resources, 2011) 24

Figure 2.4: Value chains identified in the South African Beneficiation Strategy (Department of mineral resources, 2011) 25

Figure 4.1: Bojanala Platinum District Municipality location (Bojanala, 2022) 54

Figure 4.2: Five local municipalities of Bojanala District Municipality (Bojanala,2020) 55

Figure 4.3: Population size for the five local municipalities in the Bojanala District (IHS Markit Regional Explorer version 2112, 2022 in Rustenburg Local Municipality, 2022: p20) 56

Figure 4.4: Provincial unemployment rate official versus expanded unemployment rate (Statistics South Africa, 2021) 57

Figure 4.5: GDP contribution and major industries per province (Statistics South Africa, 2019) 58

Figure 4.6: Bojanala District Local Municipality GDP contribution in 2020 (Rustenburg Local Municipality, 2022) 58

Figure 4.7: Main employment sectors in the Bojanala District in 2020 (Bojanala, 2022) 59

Figure 4.8: PGM mines in the Western Limb of the BC (SFA Oxford, n.d.a) 60

Figure 4.9: PGM processing facilities within the BC (Smelters and Refineries) (Oxford SFA, n.d.b) 61

Figure 4.10: Transportation links within the Northwest Province (Bojanala, 2021) 63

Figure 4.11: Moses Kotane Municipality Road link (Housing Development Agency, 2008) 64

Figure 4.12: The location of Sekhukhune District Municipality (Cooperative Governance and Traditional Affairs, 2020b) 65

Figure 4.13: Five local municipalities of Sekhukhune District Municipality (Sekhukhune District, 2018) 66

Figure 4.14: The GDP contribution of municipalities in the Sekhukhune District in 2018 (IHS Markit Regional Explorer, 2018, in Sekhukhune District, 2022) 68

Figure 4.15: Distribution of mining activities in the Sekhukhune District (Sekhukhune District, 2022) 69

Figure 4.16: PGM mining companies located in the Eastern Limb of the BC (Oxford SFA, n.d.a) 70

Figure 4.17: Spatial framework for the Sekhukhune District showing major routes and economic nodes (Sekhukhune District, 2018) 72

List of Tables

Table 2.1: International Special Economic Zones 31

Table 2.2: Operational Special Economic Zones in South Africa 41

Table 2.3: Designated SEZs that are yet to start construction.....42

Table 2.4: Proposed SEZs in South Africa 42

Table 3.1: Research design subgroups.....50

Table 4.1: Opportunities identified for the Bojanala SEZ (Bojanala, 2022).....62

Table 4.2: Opportunities identified for the Fetakgomo-Tubatse SEZ.....71

Table 5.1: The proposed viability matrix for SEZ.....76

Table 5.2: The proposed viability matrix range for SEZ.....78

Table 5.3: The viability matrix results for Bojanala SEZ 78

Table 5.4: Viability Matrix for Fetakgomo-Tubatse SEZ 81

Abbreviations

AMI	Advanced Metals Initiative,
Asgisa	Accelerated and Shared Growth Initiative for South Africa
BC	Bushveld Complex
BRICS	Brazil Russia India China South Africa
COGTA	Cooperative Governance Traditional Affairs
CSDP	Competitive Supplier Development Programme,
DMRE	Department of Mineral Resources and Energy
DTI	Department of Trade and Industry
DTIC	Department of Trade, Industry and Competition
EMLM	Elias Motsoaledi Local Municipality
EMLM2	Ephraim Mogale Local Municipality
EPZs	Export Processing Zones
FDI	Foreign Direct Investment
FICAS	Facility for Investment Climate Advisory Services,
FTLM	Fetakgomo-Tubatse Local Municipality
FTZ	Free Trade Port
GDP	Gross Domestic Product
GEAR	Growth Employment and Redistribution
HDR	Human Resource Development
IBSA	India Brazil South Africa,
IDC	Industrial Development Corporation
IDP	Integrated Development Plan
IDZs	Industrial Development Zones
IPAP	Industry Policy Action Plan
KRLM	Kgetleng Rivier Local Municipality
LEDA	Limpopopo Economic Development Agency
MKLM	Moses Kotane Local Municipality
MaLM	Madibeng Local Municipality’
METS	Mining Equipment Technology and Services
MLM	Moretele Local Municipality
MMDB	Minerals and Mining Development Board,

MPRDA	Mineral and Petroleum Resources Development Act 28 of 2002
MtLM	Makhuduthamaga Local Municipality
MTSF	Medium-term Strategic Framework
NGP	New Growth Path
NIPF	National Industrial Policy Framework
NIPP	National Industrial Participation Programme
NWDC	North West Development Corporation
OEM	Original Equipment Manufacturers,
ORT	O R Tambo International Airport
PBC	Platinum Beneficiation Committee,
PGM	Platinum Group Metals
R&D	Research and Development
RDP	Reconstruction and Development Programme
RLM	Rustenburg Local Municipality
SA	South Africa
SAF	Sustainable aviation fuels
SARS	South African Revenue Services
SEZ	Special Economic Zone
STI	Science and Technology Innovation
UG2	Upper Group 2
UK	United Kingdom
USA	United States of America

1. INTRODUCTION

Countries benefit from natural resources by exploiting them and these natural resources are an important source of fiscal revenue (current and potential future inflows) and foreign exchange. However, for a number of reasons such as political, institutional, social, cultural factors as well as international trade barriers, international financial barriers as well as social and cultural factors countries are unable to self-start and sustain their economic growth. These countries then have to put in mechanisms and initiatives to effect major institutional, economic and social transformations to develop their economies. These initiatives range from macroeconomic tools such as fiscal policy, monetary policy, inflation control mechanisms, exchange rate policy and to outward looking strategies such as import promotion strategies, export promotion strategies and industrialisation strategies.

These industrialisation strategies are often referred to as industrial policies. Industrial policies are government policies which are used to change the productive structure of an economy towards sectors of the economy that are expected to offer better growth prospects than what would be achieved without such interventions (Pack and Saggie, 2006). Industrial policies focus on the changing aspects of the economic system and can be used to address market failures to encourage the growth of an economy and kick start structural change (Biachi and Labory, 2019). The type of structural change required involves new production systems, new technologies and new skills for the workforce which will lead to new regulations and institutional changes (Biachi and Labory, 2019).

Special Economic Zones are often deployed as one of the many tools to advance the industrialisation agenda. Special Economic Zone (SEZ) are geographically selected areas of a state or area that have been selected or set aside for specific economic activities. These activities are assisted by unique systems and provisions which are unlike those of the rest of the country (DTI, n.d.). These special arrangements would include single management/administration structures, special regulatory regimes, fiscal incentives for investors within the zone, infrastructure, and separate custom areas.

SEZ is a general term used to encompass a wide range of different kinds of zones such as science and technology parks, industrial parks, high technology zone, enterprise zones, free ports, free trade zones, export processing zones, technology and economic development zones and others (Facility for Investment Climate Advisory Services, 2008). Historically, SEZ have been traced back to the 16th and 17th centuries in Gibraltar and Singapore and modern day SEZs such as Export Processing Zones (EPZs) in Latin American and Asia are established to encourage exports by attracting Foreign Direct Investment (FDI) into manufacturing sectors. By 2018, there were approximately 5383 SEZs in over 147 countries (United Nations Conference on Trade and Development, 2019).

In South Africa, SEZs are used by the government to develop sectorial Special Economic Zones to promote the goals of the Industrial Policy Action Plan (IPAP). Bojanala and Fetakgomo-Tubatse SEZs have been earmarked to be developed in the Bushveld Complex (BC) due to their close proximity to the Platinum Group Metal (PGM) mines and processing facilities. Therefore, the purpose of this research is to explore if a PGM SEZ can be developed successfully in the BC and be used as an instrument to increase the mining industry's contribution to South Africa's economic development.

1.1. Research Background

South Africa's mining industry has historically been the main driving force behind its economy since the discovery of minerals such as diamonds in 1866 in Kimberley and gold in 1886 in the Witwatersrand basin. In 2010, it was estimated that the country had mineral reserves worth US$2.5 trillion (Porter and Heppelman, 2014). Gold, PGMs, coal, iron ore, diamonds and manganese are some of the minerals mined in South Africa. South Africa's gross domestic product (GDP) amounted to R5 521 billion in 2020, of which mining contributed R361.6 billion or 6.5% of GDP (Minerals Council South Africa, 2021). GDP is one of the indicators used to measure the country's economic performance (Statistics South Africa, 2013). Furthermore, the mining industry in addition to the finance and trade sectors were noted as the most significant contributors to GDP increase between the fourth quarter (Q4) of 2020 and the first

quarter (Q1) of 2021 as shown in Figure 1.1, during the Covid-19 pandemic peak globally (Statistics South Africa, 2021), indicating the potential resilience of mining during pandemics.

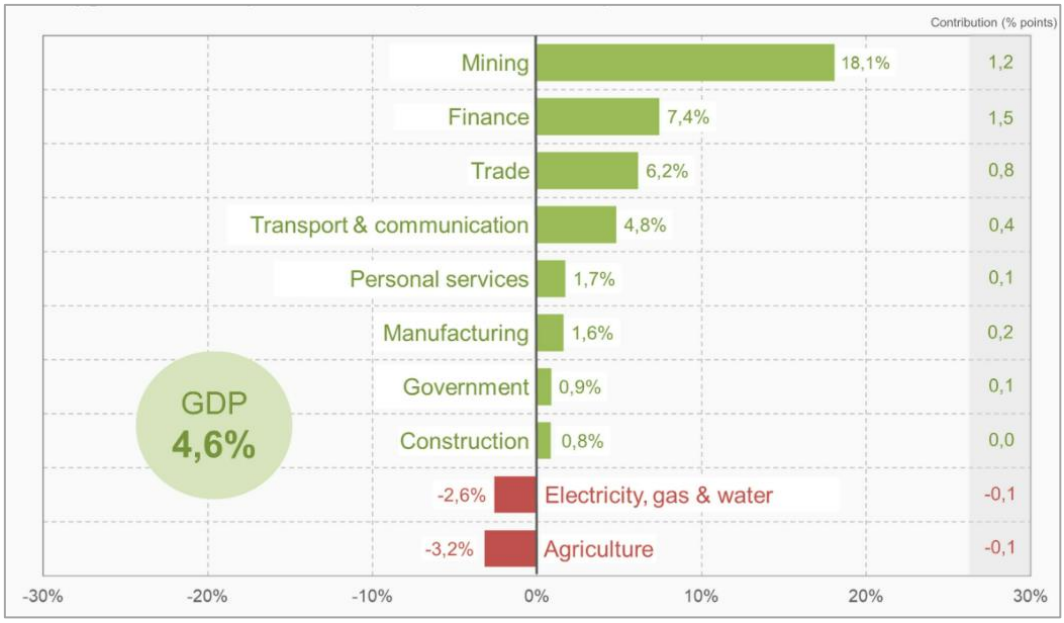


Figure 1.1: Industry Growth in Q1 of 2021 Compared to Q4 of 2022 (Statistics South Africa, 2021)

Even though the overall mining industry's GDP contribution has dropped from 21% in the 1980s to 6.5% in 2020, it is still an important contributor to the economy of South African because it employs about 2.5% of the total South African workforce predominantly in the four provinces, North West, Limpopo, Mpumalanga and Northern Cape (Statistics South Africa, 2018). Employment figures in the mining industry have also been on a steady decline, the mining industry employed 514 859 people at the end of June 2019 and the PGM mining sub-industry employed the largest number of people at 38.5% of that figure (198 574). In terms of provincial estimates, the North West Province was the highest contributor to the employment statistics in mining with 150 003 (29.1%) followed by Limpopo with 110 319 (21.4%) (Statistics South Africa, 2021). In 2021, the PGMs mining sub-industry employed the largest proportion of the workforce (36.2%) followed by gold (20.8%) and coal (20.3%) sub-industries respectively (Minerals Council South Africa, 2021).

The Minerals Council South Africa (2020) has also noted that the PGM sub-industry has the largest sales in the mining industry in South Africa. This shows that the PGM mining sub-industry is essential to the sustained economic growth of the two provinces and livelihoods of communities that depend on it.

The PGMs in South Africa are mined from the BC deposit, found across three provinces namely the North West, Limpopo, and Mpumalanga provinces. The BC hosts the largest known deposits of PGM bearing ore in the world. PGMs are found in three major reef horizons which are Platreef, Upper Group 2 (UG2) and Merensky Reef, (Cawthorn, 2010). The BC is divided into three limbs, namely the Eastern Limb (Burgersfort-Limpopo), Western Limb (Rustenburg-North West) and Northern Limb (Mokopane-Limpopo). The mining of PGMs in South Africa initially began in the Western Limb of the BC in the 1930s with the focus being on Merensky reef and UG2 mining started in the early 1970s. PGMs have a wide variety of applications and the demand is driven by several sectors namely (Creamer,2006; Johnson Matthey, n.d.):

- Automotive: autocatalysis, spark plugs and oxygen sensors
- Jewellery;
- Fuel cells;
- Electrical: electronics such as video recorders, computers and music players
- Glass: glass fibre, liquid crystal displays for televisions and flat-screen computer monitors
- Aeroengine turbine blades: Platinum aluminide coatings
- Chemical (edible oil, methanol, ammonia, petrochemicals, nitric acid, formaldehyde, low carbon solutions, oleochemicals, process licensing);
- Energy (bio renewables, purifications, sustainable aviation fuels (SAF), hydrogen, FCC additives, and stationary emissions control);
- Other (Medical: medical devices and treatment, battery systems, diagnostic services)

The three largest PGM producers in the world are Sibanye Stillwater, Anglo-American Platinum and Impala Platinum and they have operations spread around the BC as

shown in Figure 1.2. The other two major producers in 4th and 5th place are Northam Platinum which is also in the BC and Norilsk Nickel in Russia (Besta, 2020).

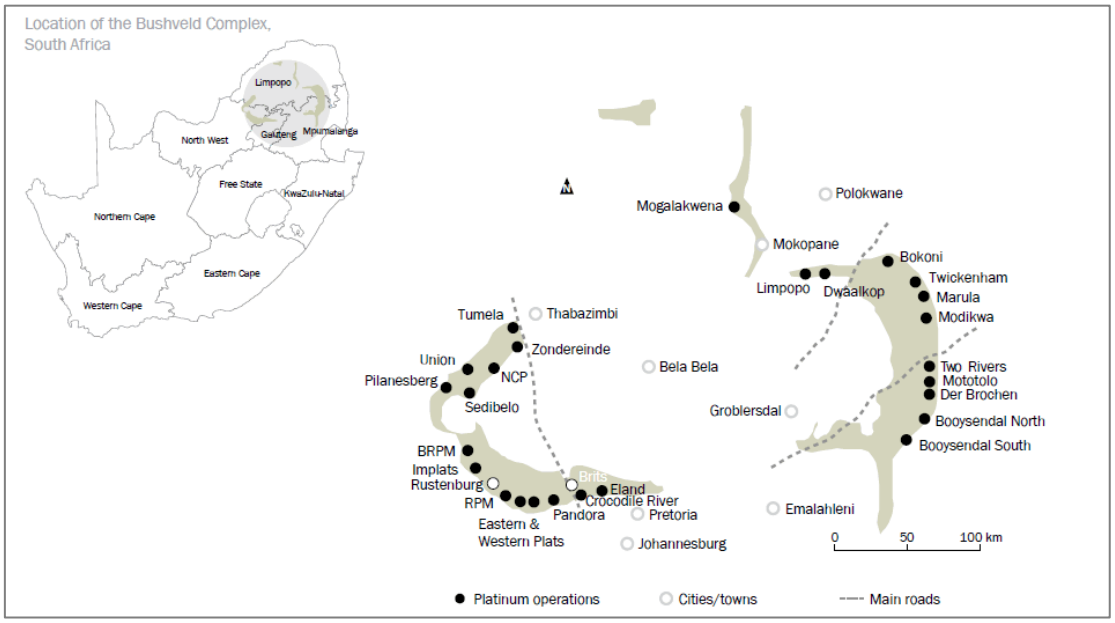


Figure 1.2: The geographical location of mines in the Bushveld Complex in South Africa (Minerals Council South Africa, n.d.)

Although the market demand for PGMs is not driven locally, South Africa is in a good position to translate its comparative advantage in terms of its PGM mineral endowment of 80% of the world's known PGM deposits in the BC into a competitive advantage (Minerals Council South Africa, n.d.). The PGM mines, concentrators, smelters, and refineries belonging to the four major producers are all uniquely situated in the BC and the opportunity exists for the establishment of several secondary and tertiary economic activities involving PGMs in the form of business clusters in the Eastern and Western limbs of the BC as shown in Figure 1.3.

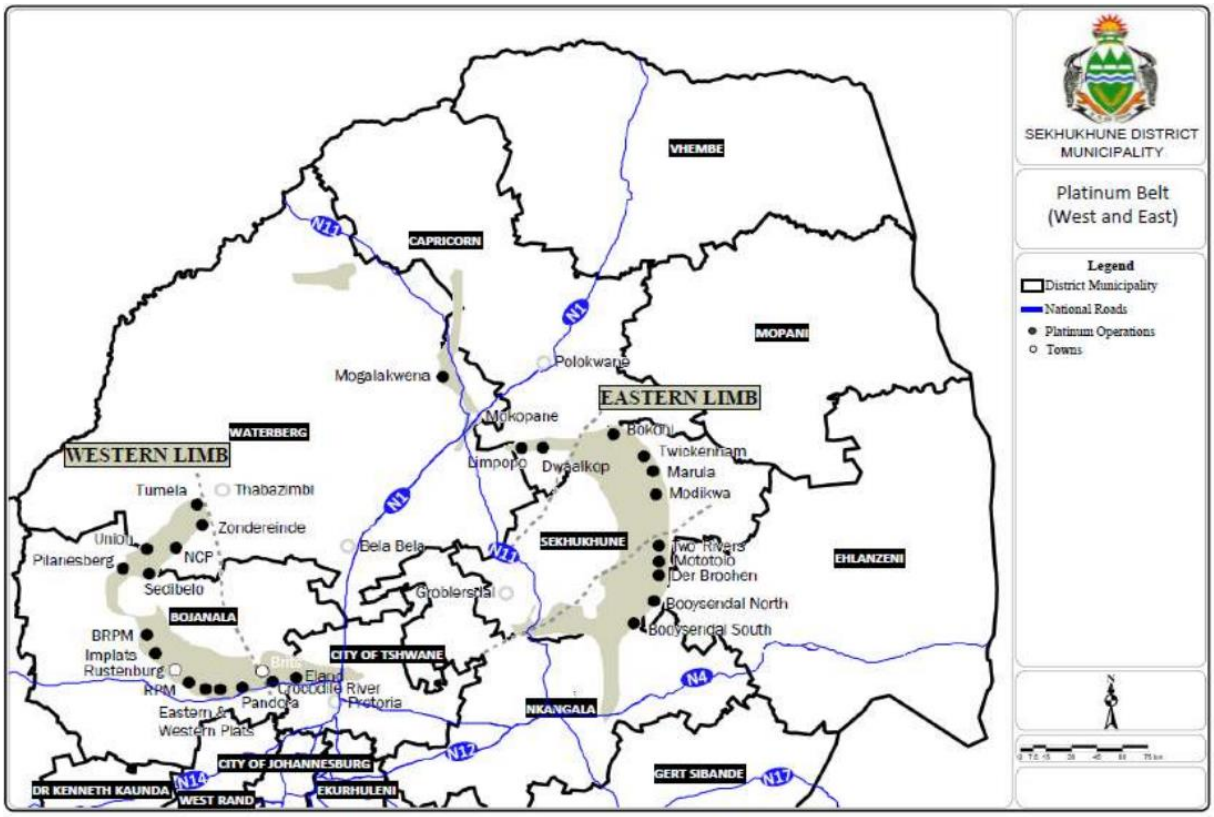


Figure 1.3: Location of mines, district municipalities and major national roads in the Bushveld Complex (Sekhukhune District Municipality, 2020)

Business clusters are connected companies such as manufacturers, suppliers, service providers and specialised institutions that are geographically concentrated in the same region. They are a mix of manufacturing and services providers in different parts of the traditional industrial system. Some benefits of business clusters include the ability to drive innovation and productivity because firms within transact easily among themselves and implement innovations more rapidly (Porter, 2007). Business cluster formation is a contested turf in economics community with two different formation theories namely:

I. The formation of clusters is spontaneous when the integration of the market induce growth due to combined presence of skilled labour and capital (Schmitz and Musyck,1994); and

II. The formation of clusters is not spontaneous, is due to policies and initiatives by government to facilitate the emergence of small and medium enterprises and

support given to ensure competitive advantage in the sector (Cowling and Sugden, 1999).

Irrespective of the business cluster origin theory, business clustering is a tool to foster economic diversification. The three main positive effects of business clusters include (Sosnovskikh, 2006):

- Labour mobility of the highly skilled individuals that bring new ideas and work practices that are transferred to encourage process and product innovations;
- Specialised supplier inputs and services; and
- Technological spillovers because of the collaboration and competition amongst co-located companies.

1.2. Research Purpose

Collier and Dollar (2001) mentioned that the nature and quality of economic policy have a monumental influence on the economic growth in a country or region. This implies that sound macroeconomic policies are required to maintain economic growth. Economic growth that meets the needs of all, does not happen in isolation but it needs an economic structure that will/can create an inclusive and diverse range of opportunities required to sustain and build the economy. Industrial development is self-sustained throughout the development process of any country if it underpinned by relevant industrial policies.

The National Industrial Policy Framework (NIPF) used in South Africa was developed in 2007 by the Department of Trade and Industry (DTI) as a framework for its industrial development (Department of Trade and Industry, 2007). The NIPF sets the vision for the long term, medium and short-term industrial growth in the country. The primary focus is on the manufacturing sector since it is seen as a key driver for the country's economic development. In addition, the Industrial Policy Action Plan (IPAP) is used by the DTI as an implementation mechanism with strategic intervention plans to ensure that the country achieves the vision articulated in the NIPF (Kaplan, 2019).

The IPAP is an instrument used by government to catalyse inclusive economic growth that will result in significant industrial growth which will have a positive impact to reduce inequality, unemployment, and poverty in SA. The IPAP is revised by the Department of Trade, Industry and Competition (DTIC) every three years with a 10-year outlook annually and it seeks to implement key measures such skills development, access to finance, quality and productivity improvements by black manufacturing companies, access to markets, and standards (DTI, n.d).

SEZ is one of the initiatives used to fulfil the goals of the IPAP by promoting growth and sustainable employment through regional diversification of the industrial economy. This is achieved by facilitating the development of new industrial hubs in developing areas of the country. In this respect, the purpose of this study is to explore if a PGM SEZ can be developed successfully in the BC in the manner that it can be used as an instrument to increase the mining industry's contribution to South Africa's economic development.

1.3. Problem Statement

The Special Economic Zones Act (SEZ) act No. 16 of 2014 is currently being used by the South African government to develop sectorial Special Economic Zones to promote the goals of Industrial Policy Action Plan (IPAP). Some of the key focus areas of the IPAP include a continuing effort to build a less concentrated and more competitive economy which encourages new entrants through lowered barriers for entry across key sectors of the economy. Secondly to achieve an integrated, development-friendly investment framework that is well regulated to increase the levels of productive capital inflows (domestic and foreign) into the economy (DTI, n.d.).

The Special Economic Zones Act No. 16 of 2014 states that SEZs may be multi product or sector specific as per the Act and have many incentives namely preferential corporate tax, building allowance, employment incentives, tax allowance, etc. (DTI, n.d.). South Africa currently has 11 designated and six proposed SEZs. These SEZs were established to promote industrial growth and to date they have secured more

than R56 billion worth of investment from 222 companies (Cape Business News, 2021).

The most successful and leading SEZ in Africa is the Coega SEZ having managed to secure R8 billion in foreign direct investments since its inception in 1999 from 45 operational investors. Recent investments secured by the Coega SEZ include R719 million from 12 investors in 2020 and R49 million from four investors in 2021 (Coega Development Corporation, 2021).

In addition to the 11 designated SEZ, there are 6 proposed SEZ, two of which are the Bojanala SEZ and the Fetakgomo-Tubatse SEZ which are both located in the BC (The Department of Trade Industry and Competition, 2021). The Bojanala SEZ will be in the Western Limb of the BC in the North West Province and the Fetakgomo-Tubatse SEZ will be in the Eastern Limb of the BC in the Limpopo Province. Both these SEZs will focus on mineral beneficiation of PGMs and mining input supply.

The Bojanala and Fetakgomo-Tubatse SEZs, despite being located in different geographical locations and closer to mines, will not only be in direct competition with each other, but will also be competing with established manufacturing and mining services hubs in Ekurhuleni and Johannesburg metropolitans in the Gauteng Province. Therefore, this research sought to investigate the likelihood of the success of the Bojanala and Fetakgomo-Tubatse SEZs in line with the research purpose.

1.4. Research Objectives

Research objectives are succinct statements which provide direction on the variables to be investigated during the execution of a research (Jaikumar, 2018). Variables are factors that the author wants to evaluate in the study so that the differences and corelation between them, including trends and other insights contained within the data can be identified. The research objectives outline the research design (the data collection, data analysis), outcomes of the study and ultimately the conclusion.

Dhir and Gupta (2021: p. 584) mention that “objectives should always be framed in alignment of the research question using SMART (specific, measurable, achievable,

realistic and time defined) approach". This approach has been used to create, track and accomplish the purpose of this study. In this context, the objectives of this research are to:

- provide detailed overview of the South African SEZ landscape, including Bojanala and Fetakgomo-Tubatse SEZs; and
- develop a viability matrix to assess which SEZ in the BC is likely to succeed based on the socio-economic profile, education level, spatial linkages, and sector analysis.

1.5. Research Questions

Research questions are an important and fundamental part of conducting any study or research. Rattan et al (2018) mentioned that the research questions articulate the problem that is being considered and guides the research methodology (data collection and analysis). These question/questions assist the researcher in the formulation of the research purposed, objectives, and the methodology (Dhir and Gupta, 2021). In other words, the research questions play a central role as an anchor to which all parts of the study are connected i.e., the scope of the research questions are informed by the research purpose and objectives. Haynes (2006) further mentions that developing research question is an iterative process that encompasses the dimensions of the research problem, determines how reasonable and feasible a design is, and sources to address the questions.

In this respect and aligned to the research purpose, this study seeks to explore the following questions:

- Is the current SEZ model adequate to enable its success in the BC?
- Are the current socio-economic profile, education level, spatial linkages, and sectorial dynamics sufficient to enable the success of the PGM SEZ in the BC?

1.6. Structure of the Report

This report consists of seven chapters. Chapter 1 introduces the topic and underlines the problem statement, objectives, methodology, and scope of work and the structure of the report. Chapter 2 discusses economic development theories and South African development policies, including the types of SEZ globally, SEZs related to mining, policy instruments for SEZ and the local South African SEZs. Chapter 3 covers the research methodology used in this research including approach, design, sources of data, data analysis and validation. Chapter 4 then gives a detailed overview of the Bojanala and Fetakgomo-Tubatse socio-economic profile, sector analysis and spatial linkages. This will then be followed by analysis and discussion looking at the proposed SEZ viability matrix in Chapter 5. Chapter 6 provides a summary of the report and recommendation.

2. LITERATURE SURVEY

2.1. Introduction

This chapter will provide details of the existing theories on economic development, reflecting on the various models that have been used and are currently being used to drive economic development in various countries. Economists have developed theories from the 1950s/1960s to explain how economic development can be achieved. These theories include among others linear stages of growth, structural change models, neoclassical counter revolution and international dependence revolution.

This is followed by a general overview of the development policies used in South African and subsequently focusing on the industrial policy and beneficiation strategy. Lastly, the focus turns on an overview of the SEZs and policy relating to SEZs in South Africa.

2.2. Economic Development

Economic development is a subdivision of economics that is centred on social, economic, and institutional mechanism required to bring improvements in the standard of living. This is done by formulating relevant public policies which are designed to effect major social, economic, and institutional transformations. Economic development is focused on achieving sustained growth rates of incomes per capita to enable nations to expand their output faster than the population growth rate (Economics Online, n.d.).

Economic indicators such as real income per capita; health measure (child mortality, life expectancy, and undernourishment); education (literacy and schooling); housing quality and availability; and improvement in the level of environmental standards, are used to measure if a country is on the path of economic development or not (Economics Online, n.d.). Generally, four theories have dominated economic development literature since post World War II.

2.2.1. The Linear Stages of Growth Model

The Rostow Stages Growth Model or as commonly known as the linear stages of growth model was popular in the 1950s and early 1960s and stipulates that a country progresses through successive stages in achieving development (Abraham, 2013). This model stipulates that for any take-off, investment, foreign aid to generate sufficient investment to accelerate economic growth, the right quantity and mixture of savings, mobilisation of domestic and foreign savings is required (Nafziger, 2006).

2.2.2. Structural Change Model

The Structural Change Model is focused on the mechanisms through which developing economies are able to change their domestic economic structure to an urbanised modern industrially diverse manufacturing and service economy from the traditional agricultural sector (Abraham, 2013). The traditional economy is based on household decision making and the industrial and service economy is based on hiring labour to maximise profits (Gersovitz et al., 2011).

The structural change models have two strands of thought namely Lewis' Two Sector Theory and Patterns of development analysis. The Lewis' Two Sector Theory consists of two sectors where there is labour transfer to emerging and growing industrial sector from the traditional sector where there is an oversupply (Ghatak, 2003). These changes are brought about by output expansion in the industrial sector.

The second structural change model used is the Patterns of Development Analysis which is centred on the mechanisms in which industrial, economic, and the institutional structure of an underdeveloped economy changes over a period of time to replace the traditional sector with industries (Todaro and Smith, 2015). Hence a set of interdependent changes are required in the economic structure to enable the country to transition to a modern economic system from a traditional one.

2.2.3. International Dependence Revolution

The International Dependence Revolution stipulates that developing countries are entangled by economic, institutional, and political rigidities in the domestic and international space. This implies that developing countries are trapped in a dependence relationship with developed countries and the foreign capital inflows and associated vested interests interfere with balanced social and economic development (Marsh and Lake, 1978). The International Dependence Revolution has three strands of thought namely (Todaro and Smith, 2015):

- In the Neo-colonial Dependence Model, the existence of underdevelopment and continuation of underdevelopment is seen as a result of the continuing exploitative, economic, cultural and political policies of former colonial rulers towards developing countries.

- The False Paradigm Model stipulates that underdevelopment is attributed to development strategies given by western economies to developing countries which are based on incorrect model of development which often lead to incorrect policies.

- The dualistic development model looks at underdevelopment in terms of domestic and international power relationships, structural and institutional economic rigidness and resulting dual societies/economies amongst nations. The world of dual societies is where there is an existence of broad areas of poverty and isolated pockets of wealth, traditional and modern economic sectors, higher education amongst large scale illiteracy as well as growth and stagnation. Economic development is seen to be constrained by the internal institutional and political constraints of that country.

2.2.4. Neo-classical Free Market Counter Revolution

The neo-classical counter revolution theorists believe that developing countries are vastly different in organisation and structure to their western counterparts and as such the policy principles and behavioural assumptions of traditional neo-classical theory

are often impractical. The theory over emphasizes the role of open makers and open economies because underdevelopment is seen to be due to too much state intervention by overly active developing country's government, incorrect pricing policies, and poor resource allocation (Nafziger, 2006). Competitive free markets generally do not exist in developing countries due to the institutional, cultural, and historical context they find themselves in.

While these theories individually in totality could be unrealistic depending on a country's economic circumstances, culture, and structural impediments, certain elements from each of them could be combined to provide a solution to an economic development problem.

2.3. Economic Development in Perspective

Import substitution strategies are used to promote the emergence and expansion of domestic industries by replacing imported consumer goods. Export promotion strategies are focused on efforts to increase the country's exports volumes by increasing export incentives and other means to generate more foreign exchanges (Todaro and Smith, 2015).

Access to the developed countries' markets is an important factor for developing countries that are focused on export promotion in the areas of the economy where they possesses a comparative advantage. Comparative advantage is a country's ability to specialise in services and produce goods at a lower cost than other countries. Comparative advantage rests on the endowment of inputs such a as capital, labour, and natural resources (Porter, 2011). Neingo and Tholana (2016) have noted that South Africa has significant challenges that prevent it from translating comparative advantage in the form of mineral endowment into a competitive advantage.

Industrial strategies are an important consideration in the design of a developing country's export strategy. These industrialisation strategies are often referred to as industrial policies. Industrial policies are type of selective policies used by government to change the structure of production towards areas of the economy that are forecasted

to offer greater prospects for growth than would arise if such interventions are absent (Pack and Saggie, 2006). Industrial policies are concerned with the variability of the economic system and can be used to address market failures to encourage economic growth and kick start structural change. The type of structural change required involves new productions systems, new technologies and new skills for the workforce which will lead to new regulations and institutional change (Biachi and Labory, 2019). Policy changes in financial and macroeconomic structures are required in addition to industrial policy to influence the production potential of the country (Andreoni et al, 2019).

The first major industrialised country in the nineteenth century was the United Kingdom (UK) which used manufacturing to accelerate the growth of its economy (Szirmai, 2012). Industrialisation was based on funding from government and financial institutions (Dervis and Page, 1984) The manufacturing technologies developed in the UK spread to other European countries such as France, Switzerland, and Belgium. The United States of America (USA) later followed with their industrialisation path, which was based on primary exports, natural resources, and abundance of land (Szirmai, 2012).

The industrialisation path in the USA latter evolved into innovation and technology in the mid-1900s (Biachi and Labory, 2019). Other countries such as Russia, Japan and Germany followed as latecomers in the industrialisation process, profiting from the modern technology which was developed by the leading industrial nations of the west (Gerschenkron,1962). Public enterprises were used to guide investments into key industrial sectors where private investment was insufficient. Industrial development acts or codes were used to control private and foreign investments through setting out terms and conditions under which investments were to be undertaken (Dervis and Page, 1984).

Industrialisation in the west created an increased demand for agricultural and mining products which were imported from developing countries. China, Malaysia, and Brazil implemented policies to transform and promote their manufacturing and resource-based sectors through the use of industrialisation strategies (Biachi and Labory, 2019).

More recently countries like Singapore, Taiwan and South Korea have also actively used industrialisation strategies/policies to encourage indigenous skills and technology in their economies (Todaro and Smith, 2015).

Since the 1960s economic growth in most of the developing countries has been associated with the transfer of resources into the more modern industrial sector from traditional (Rodrik, 2009). Rowden (2011) mentioned that in order for developing countries to use industrial policies to alter their domestic industries, they must expand their economies and increase their own tax base over time in order to emerge from the aid dependency. The success of industrial policy is essentially dependent on the states capacity to deploy and coordinate strategically multiple policy instruments; and establish resource institutions that are responsible for addressing complex interdependent dynamics such as investments, skills development, market regulations, trade policies, etc. (Rowden, 2011). Zeng (2015) mentioned that one way of implementing an effective industrial policy that is focused on different industries is by enhancing the infrastructure required by manufacturers in a specific area of a country, for example, creating Special Economic Zones (SEZs).

2.4. South African Economic Development Policies

South Africa has had a myriad of economic development policies since the establishment of democracy in 1994. The policies include Growth Employment and Redistribution (GEAR), National Development Plan (NDP), and Reconstruction and Development Programme (RDP), Accelerated and Shared Growth Initiative for South Africa (ASGISA), and New Growth Path (NGP). The first policy to be introduced post democracy was RDP, which was centred on addressing the inequalities of apartheid that manifested economically, spatially, and socially in South Africa. This was to be achieved by focusing on five key programmes (Government Gazette, 1994):

- Building a dynamic, strong and balanced economy;
- Growing human resource capacity of South Africa citizens;
- Safeguarding against racial or gender discrimination in training, hiring, and promotions;

- Building a stabilized and prosperous regional economy in Southern Africa; and
- Making the society and the state more democratic.

Due to the limited success of the RDP and possibly the desire of the government to hastily shift away from seemingly socialist policies, the Growth Employment and Redistribution (GEAR) strategy was put in place in 1996 to increase the economic growth of South Africa. GEAR was aimed at lowering inflation, reducing fiscal deficit, maintaining the stability of the exchange rate, decreasing restrictions on international trade and capital (South African Government, 2014). The objectives of GEAR included (Khamfula, 2004):

- Reduce budget deficit and inflation rate;
- Achieve 6% growth by 2000 by improving the fixed investment performances; and
- Redistribution of economic gains which was to be achieved through job creation and growth achieved through the labour market and economic reforms.

To attain the objectives of GEAR, government implemented several policies such as Fiscal Policy, industrial and small enterprise policies, monetary and exchange control policy, fiscal policy and lastly trade policies (Trade and Industrial Policies Strategies, 2016). In 2006, government conceived the Accelerated and Shared Growth Initiative for South Africa (ASGISA) which was implemented to bridge the gap between the pre and post democratic economy of South Africa after GEAR failed to create new jobs.

ASGISA was developed to address the issues related to poverty, unemployment, and low earnings and also on the supply side interventions such as skills, education and infrastructure initiatives (The Presidency, 2008). Some of the objectives included economy growth at an average rate of 6% between 2010 and 2014 and poverty reduction to be halved to 14% or less by 2010 (The Presidency, 2008). ASGISA failed to reduce unemployment and poverty in South Africa.

In 2010, New Growth Path (NGP) replaced ASGISA. The NGP was envisioned to accelerate growth in the economy of South Africa in a manner that would reduce poverty, unemployment, and inequality (South African government, n.d.). The NGP’s

main target was to create 5 million jobs in 10 years. In line with the NGP, the National Development Plan (NDP) was introduced in 2012 as a deliberate plan that sets out a long-term approach to confront inequality and poverty through radical economic transformation using development planning (Department of Planning, Monitoring and Evaluation, 2020). The (NDP) defines the desired destination for the South African economy and recognises the functions that different areas of society are required to partake in to reach the NDP goals. The NDP is national policy whilst the IDP is the deployment plan at a provincial and district level. The six pillars of the NDP include (Department of Planning, Monitoring and Evaluation, 2020):

- Solidarity with all South Africans on a series of measures to reduce inequality and eliminate poverty;
- Citizens are encouraged to be active in their own development;
- Faster and more inclusive growth, with a focus on export promotion and shaping the economy to be more labour absorptive;
- Strengthen capability of the people and the country;
- Set up a capable and developed state; and
- Leadership and responsibility towards society.

Government uses the medium-term strategic framework (MTSF) which is a 5-year plan and outcome-based monitoring framework to implement the Integrated Development Plan (IDP) (Department of Planning, Monitoring and Evaluation, 2020). The IDP includes the provincial development and growth strategies and the district development plan from the district municipalities. These IDPs focus on the mandates of local government which are critical priorities in the NDP such as spatial planning, infrastructure, and basic services (Cooperative Governance Traditional Affairs, 2018). The IDP process was first introduced in 1996 as a tool to facilitate reconstruction during the RDP era (Binns and Nel, 2002). The current iteration of the MTSF 2019-2024 includes seven priority focus areas which are aligned to the six pillars of the NDP, namely (Department of Planning, Monitoring and Evaluation, p. 5, 2020):

- Establishing an ethical, capable developmental nation;
- Job creation and economic transformation;

- Health, education, and skills;
- Integrating the societal wage through quality basic services;
- Local government, human settlements and spatial integration;
- Safe community and social cohesion; and
- A greater Africa continent and world for all.

2.4.1. South African Industrial Policy

Industrial development is customary element in which all developed countries have been built upon and is essential in sustaining any economy that wishes to follow suite. Industrialisation is the process of increasing the manufacturing through structural change (Gumede, 2015). This structural change is facilitated through the introduction of industrial policy/policies which are aimed at developing strategic interventions around certain industries. Industrial policy is divided into supply site interventions and demand side interventions as shown in Figure 2.1.

Industrial Policy	Demand Side Interventions	Increases demand for output from particular industries through enhancing market access
	Supply Side Interventions	Improve competitiveness of firms and productive capacity

Figure 2.1: South African industrial policy framework

South Africa's industrialisation has evolved around mineral resources, its associated interest, and the capital-intensive industry. The discovery of diamonds, gold and other precious minerals in the late 19th century triggered the process of mining and its related industries (Chabane et al, 2006). Historically, the apartheid government (pre-1994) used a number of inward focused interventions such as import substitution industrialisation due to the private sector's growing interest to replace imports related to inputs into resource-based production instead of having a centralised industry policy. This policy was focused on developing, protecting, and nurturing the domestic

industries using a trade tariff structure with various duties (Trade and Industrial Policy Strategies, 2016).

In the 1940s the South African government established a development bank, the Industrial Development Corporation (IDC) to promote and finance industrial activities in the country. The IDC was the first state owned entity that was established to drive the industrialisation path of South Africa by financing local enterprises and government projects linked to the chemical, steel, and energy sectors. By the 1960s the import substitution strategy implemented by government was no longer sustainable due to the relatively small size of the local economy and was later abandoned in the 1970s due to emerging debt issues, reduction in commodity prices and oil price shocks (Trade and Industrial Policy Strategies, 2016).

In the post 1994 South Africa, the first industrial policy named the National Industrial Policy Framework (NIPF), was launched in 2007. The NIPF is focused on diversifying and increasing the industrial capacity of the country in order to absorb sufficient labour. Its primary goals was to serve as framework for South Africa's industrial development and play a role in achieving the goals of ASGISA. The NIPF is based on principles, processes, and strategic tools through which organisational change can be achieved in the South African industrial development path. Through the NIPF, the government was focused on providing clarity and reliability to the private sector and its social partners on its investment decisions; and provide intra-governmental coordination of various policies and projects within the NIPF horizon (Department of Trade and Industry, 2007). The NIPF visions for the economy is as follows (Department of Trade and Industry, 2007):

- Clear the way for economic diversification that extends beyond non tradable services and commodities;
- Movement towards the knowledge economy and acceleration of the country's industrialisation process;
- Advocacy for labour absorbing industrial pathways (goods, services and economic linkages with the aim of stimulating employment;

- Advocacy and inclusion of historically disadvantaged people and marginalised areas in the industrialisation pathway to ensure their participation in the main industrial sectors; and
- Build productive capabilities and contributing to Africa's industrial development.

Makgetla (2019) mentioned that the provinces and municipalities have a critical role in supporting industrial development by ensuring there are linkages between provincial development and growth strategies and municipal integrated development plans even though the industrial policy is mostly managed and harmonized by the national government. In order to achieve its Vision, the National Industrial Policy Framework (NIPF) has implemented 13 strategic programmes which are:

- Industrial financing
- Sector strategies;
- Trade policy;
- Education and skills for industrialisation;
- Competition regulation and policy;
- Capitalisation on public expenditure;
- Upgrading industries;
- Technology and innovation;
- Industrial and spatial infrastructure;
- Service and finance to small enterprises;
- Capitalising on employment and empowerment for growth;
- Localised industrial and trade framework; and
- Organisation, coordination, and capacity.

The NIPF sets the vision for the short, medium- and long-term industrial growth of South Africa and the Industrial Policy Action Plan (IPAP) is used as its implementation mechanism with focus on strategic intervention plans. The Industrial Policy Action Plan (IPAP) is aimed at raising the levels of productive capital inflows into the economy and strengthening the on-going efforts to develop a more competitive, less concentrated economic and manufacturing structure where new entrants are able to participate

seamlessly across important areas of the economy (Department of Trade and Industry, n.d.). The IPAP is revised every three years with a 10-year outlook annually and has had several iterations since the launch of the NIPF in August 2007.

Figure 2.2 includes the latest transversal focus areas from the 2017/18 - 2019/20 IPAP. These focus areas are divided into 6 categories namely public procurement, industrial financing incentive scheme, innovation and technology, SEZs, developmental trade policy, and African industrial development. The abbreviations used in Figure 2.2 are Original Equipment Manufacturers (OEM), Competitive Supplier Development Programme (CSDP), Research and Development (R&D), Science and Technology Innovation (STI), Foreign Direct Investment (FDI), National Industrial Participation Programme (NIPP) and Special Economic Zones (SEZs).

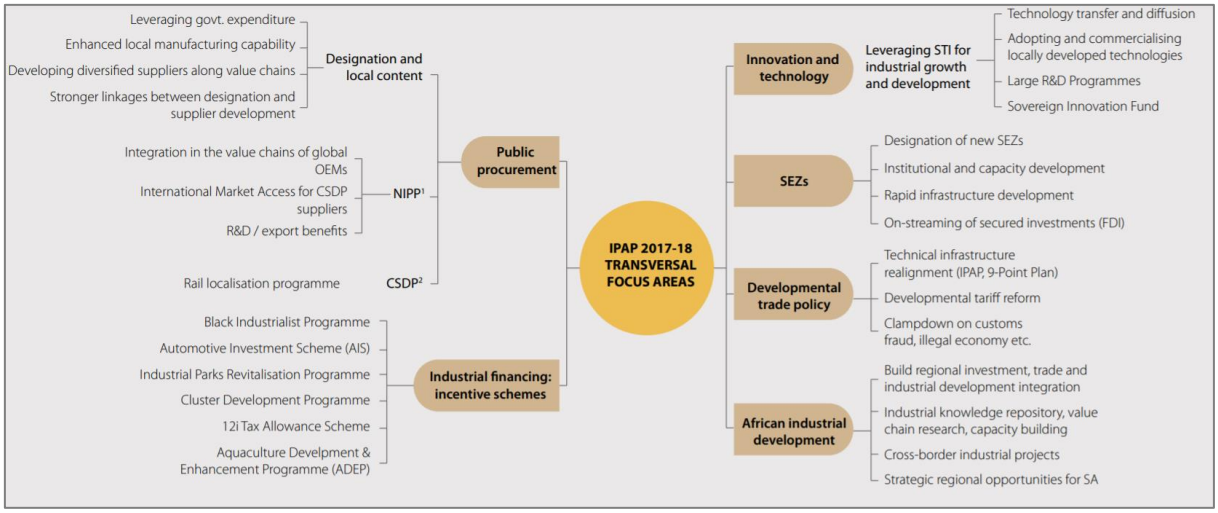


Figure 2.2: Transversal focus areas as per the IPAP 2017/18 - 2019/20 (Department of Trade and Industry, 2017)

Each iteration of the IPAP has identified the infrastructure building programme as an opportunity to grow the manufacturing sectors, the need for financing instruments to address market failures (Zalk, 2014). Zalk (2014) also mentioned that the country's mineral policy has not been implemented in a way that would ensure that South African mineral endowment can promote the growth of downstream manufacturing in the form of value addition and jobs.

2.4.2. South African Beneficiation Strategy

The South African Beneficiation Strategy was launched during the New Growth Path era and its vision is to advance the country's development through facilitation of economic diversification, optimisation of mineral value chain, job creation, and industrialisation. Beneficiation was identified as one of the focus areas that would contribute towards achieving the five million jobs by 2020 as envisioned in the New Growth path on the aforementioned economic policy.

The beneficiation strategy outlines a framework that includes the enabling policies, supporting structures, agreements and strategic interventions required for a successful outcome as shown in Figure 2.3 (Department of Mineral Resources, 2011). The abbreviations in Figure 2.3 are Mineral and Petroleum Resources Development (MPRDA) Act 28 of 2002, Platinum Beneficiation Committee (PBC), India Brazil South Africa (IBSA), Minerals and Mining Development Board (MMDB), Advanced Metals Initiative (AMI), and Research and Development (R&D).

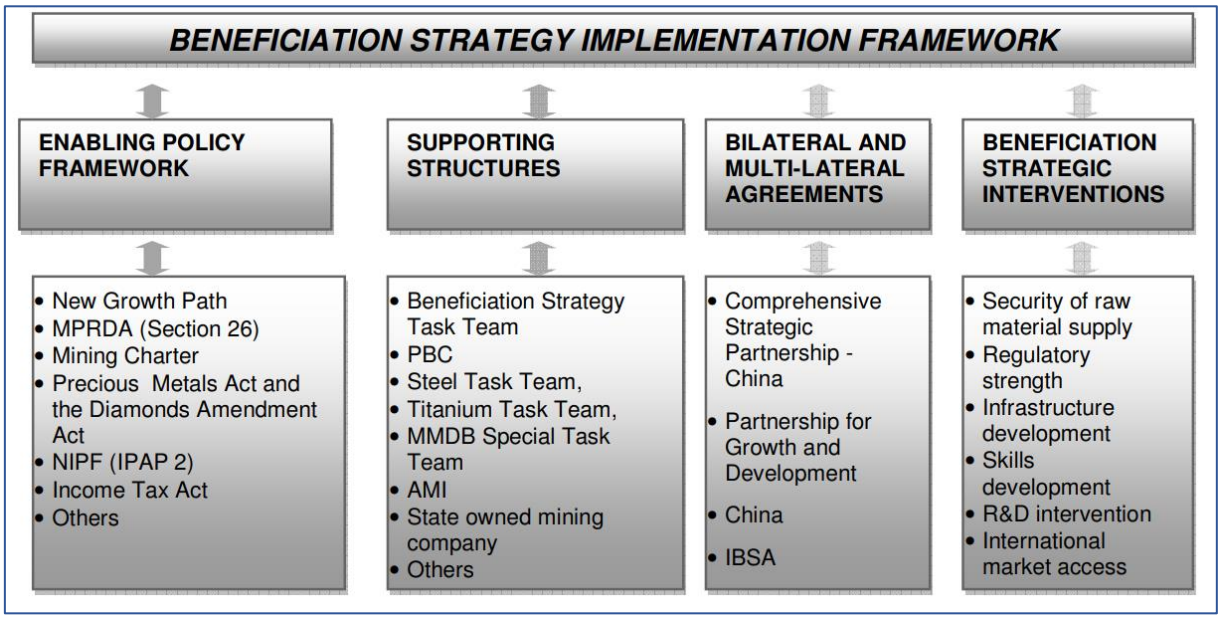


Figure 2.3: Pillars of the South African Beneficiation Strategy (Department of Mineral Resources, 2011)

The strategy details the various mineral value chains for 10 strategic mineral commodities and five value chains as shown in Figure 2.4 that have been identified by the Department of Mineral Resources and Energy (DMRE) to have an inherent value

for South Africa in embracing beneficiation. The strategy also notes that coordination is required across different government departments such as Mineral Resources and Energy, Economic Development, Trade and Industry, Science and Technology, Public Enterprise, as well as the labour and business to enable successful implementation (Department of Mineral Resources, 2011).

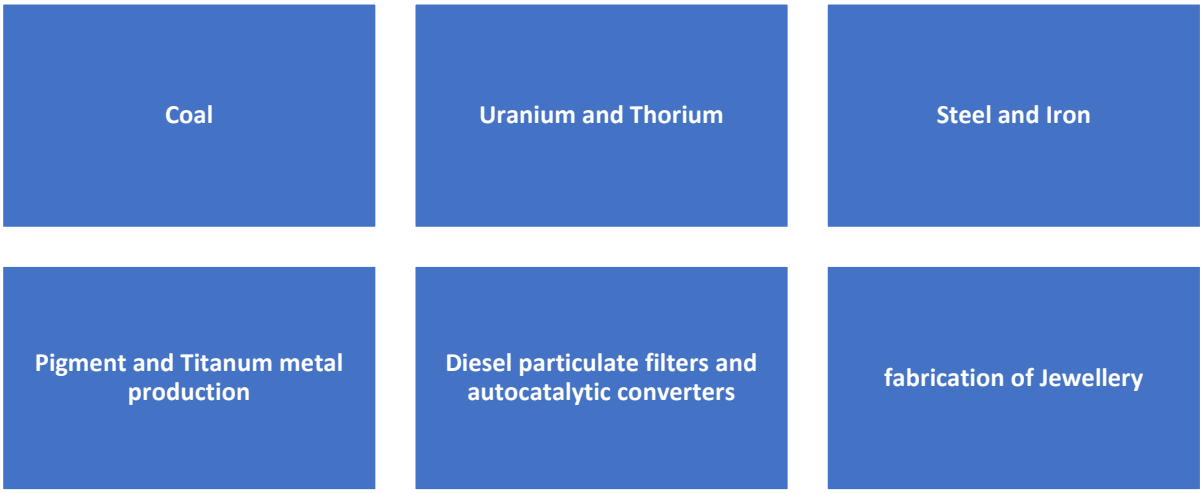


Figure 2.4: Value chains identified in the South African Beneficiation Strategy (Department of mineral resources, 2011)

The DMRE further mentioned that, in spite of South Africa's mineral endowment, the country had not been able to successfully translate its endowment into a fledging beneficiation industry. Factors that have inhibited the development and implementation of beneficiation in South Africa were identified as (Department of Mineral Resources, 2011):

- Restricted access to raw materials for local beneficiation which is due to current export orientated structure of the mining industry and long-term contracts with clients;
- Shortages of infrastructure such as rail, ports, water and electricity which are critical in the beneficiation process and getting products to market;
- Limited research and development as well as programmes geared towards creating innovative products for beneficiation;
- Skills challenge for beneficiation and lack of attention on the skills supply pipelines; and

- Limited access to the export market due to trade barriers.

Muller (2019) further mentioned that beneficiation should be broader and cover all touchpoints within the mining industry including knowledge, side-stream, and upstream linkages, in addition to the downstream linkages detailed in the beneficiation strategy. Some of these beneficiated products could feed into agriculture, manufacturing, power generation and construction in order to achieve economic growth.

2.5. Types Of Economic Zones

This section reviews different SEZ globally, including selected African SEZs. The aim is to reflect on how different countries have implemented SEZs and review the outcomes achieved. The section will also reflect on the common threads amongst the SEZs reviewed.

2.5.1. Special Economic Zones

SEZs are distinct regions of a country that have been demarcated for particular economic activities and are underpinned by special arrangements and structures as opposed to the rest of the country (Department of Trade and Industry, n.d.). Some of these special arrangements include single management/administration structure, special regulatory regimes (liberal laws for labour, land use, etc.), fiscal incentives for investors within the zone, infrastructure (roads, power, water) and separate custom areas (duty free and streamlined procedures) (Zeng, 2010). Capacity building, development and engagement are important elements to the success of any SEZ. Capacity building in this instance refers to the process of obtaining, improving, and retaining skills and knowledge needed to do the work competently.

SEZs are used as instruments to promote foreign direct investment, industrialisation, and sustainable economic growth. The SEZ offers economic benefits to businesses that are located within the economic zone and the host country by offering opportunities for investment which results in the capital formation and production of goods for export as well as the domestic market, including in other cases specialised services. SEZs

cover an extensive range of zones such as industrial parks, free trade zones, high tech zones, export processing zones, free ports, science and technology parks, economic and technology development zones, enterprise zones and others (Facility for Investment Climate Advisory Services, 2008). The concept of SEZ has been implemented globally with notable success in Latin America, Asia, and to some extent in sub-Saharan Africa (Zeng, 2010).

The origins of SEZ are in Gibraltar and Singapore in the 16th and 17th century but the emergence of modern day SEZ was in Latin America and Asia where they assumed a structured form of Export Processing Zones (EPZs) to attract Foreign Direct Investment (FDI) in the manufacturing sectors to stimulate exports. Successful EPZ are found in countries such as Taiwan, China, Vietnam, Republic of Korea, El Salvador, Dominican Republic, Bangladesh, and Mauritius (Farole and Akinci, 2011). These initial EPZ where fenced-in areas with stringent customs control and over 80% of the products were exported.

Zeng (n.d.) mentioned that the presence of EPZs had grown from 176 in 47 countries to over 4300 EPZs in 130 countries between 1980 and 2006. Later in the years EPZs were referred to as Industrial Development Zones (IDZs). Although the IDZs were widely successful, many had limitations because they tended to develop into enclaves without any linkages to the local economy and become excessively reliant on fiscal incentives. Many countries started moving towards SEZs which cover a wider area, have added linkages with the local economy, and are versatile and less depended on government incentives. By 2018, there were approximately 5383 SEZ in over 147 countries according to United Nations Conference on Trade and Development (2019).

Zeng (2010) mentioned that SEZs in China, in the first decade of this millennium, accounted for more than 30 million jobs, contributed 46% of FDI and 60% of exports and accounted for 22% of the national GDP. A SEZ's success is measured against the objectives defined when it was established and also its return on investment. These objectives can be linked to outcomes such as investment, foreign exchange, employment, exports, economic and policy reforms. There are different types of

economic zones and their form is depended on the policy objectives of the host country. These types are:

- Free Trade Port (FTZ): This is a fenced-in duty free area that offer storage, warehousing, and trans-shipment, distribution facilities for trade, and re-export operation. These are normally located around the ports and are the oldest most common SEZ (Facility for Investment Climate Advisory Services, 2008). For example, the Colon Free Zone in Panama was opened in 1948 to capitalise on the canal traffic and trade opportunities (Farole, 2011);

- Traditional Export Processing Zone (EPZ): This is an industrial park larger than FTZ offering facilities and incentives for manufacturing and related activities aimed at export markets (Facility for Investment Climate Advisory Services, 2008). EPZs were started to accelerate industrialisation and international trade in developing nations. The Masan Free Zone in Korea was created in 1970 to draw FDI in the manufacturing and export sectors and to complement the Korean economy;

- Free enterprises: This system is applied to companies that wish to receive FTZ benefits but are discouraged by high relocation fees. Incentives in this case are offered to enterprises regardless of the location, they are sometimes referred to as single factory EPZ (Facility for Investment Climate Advisory Services, 2008). In Africa, the Mauritius Export Processing Zone is one of the most successful free enterprise type of EPZ (Facility for Investment Climate Advisory Services, 2008). Companies are free to locate anywhere on the island because it is only 1800 km^2 and are granted FTZ benefits on an individual status;

- Hybrid Export Processing Zone: This is a subdivided EPZ that comprised of a general zone for all industries and detached EPZ for export-oriented enterprises (Facility for Investment Climate Advisory Services, 2008). These are evolved EPZ open to a broad range of activities;

- Special Economic Zone: This is designed to accommodate different types of activities from manufacturing to retail, to tourism, etc (Facility for Investment

Climate Advisory Services, 2008). The SEZ terminology has been adopted to refer to freeports. The Aqaba SEZ economic zones in Jordan and the Chinese SEZ are all free ports because they include large parts of territory both rural and urban areas and include larger transport facilities and airport (Farole, 2011). Freeport can also include economic regions and population of people that work and live in these regions; and

- Enterprise Zone: This is a specialised zone that focuses on science and technology parks, airport-based zones, logistics parks, and petrochemical zones. Enterprise zones are used to re-energize rural or urban areas through providing financial grants and incentives (Facility for Investment Climate Advisory Services, 2008).

The SEZ foundational proposition is the formation of an environment where it is less challenging and low-cost for the private sector to take part in economic activities. The product being a mixture of factors of production, capital, knowledge, and technology to be of service to their markets. The assumption of SEZ is that the prevailing policy environment is not favourable, quantitatively or qualitatively, for economic activities to take place effortlessly and cost-effectively, because of institutional, regulatory, and spatial-infrastructure limitations (Parliamentary Monitoring Group, 2013).

It should be noted that, firstly, the regulatory regime provides an enabling legal environment where the laws of business would be unlike those outside the zone. The SEZ regulatory regime must guarantee the safety of investment and the business licencing must be approved more speedily. Secondly, the physical infrastructure is also needed but it is not the most crucial elements because a flawed regulatory framework and institutional environment will never attract FDI. Thirdly, institutional capacity is needed to support the regulatory framework and infrastructure; there has to be strong institutions to run these structures to ensure proper enforcement of the regulation to promote the zone, accompanying infrastructure and strong licencing authority (Parliamentary Monitoring Group, 2013).

Different countries adopt particular types of SEZ as per their stage of economic development for example, to kickstart manufacturing, upgrade industrialisation and/or

improve exports. Farole and Akinci (2011) mentioned that the first day modern SEZ was in Shannon Ireland in 1959, its success is attributed to the coordinated and integrated development approach to SEZ which is inclusive of training and skills which are focused on industry needs as well as change management (cultural and social). The Shannon zone was created as an industrial hub that exchanged commodities, capital, and labour flow with the local economy and had several other different attributes that led to it success namely (Farole, 2011):

- A different custom regime;
- Investment incentive program;
- Dedicated administrative support that covers labour and investment;
- Industrial zone with readily build infrastructure; and
- Co-location within a major transport area.

SEZ were also deployed in Malaysia in the 1960s and the 1970s to reform the country's economy from the structuralist internal industrialisation to an open export economy. SEZs were used as a tool to allow Chinese population to freely invest in the export global market economy whilst the government focused its efforts on the Malaysian majority population which were previously excluded from the economy. Malaysian zones grew by 13.3 zones per year and by 1995 it had more than 400 operating firms in the zone. The zones hired nearly a million workers, most of which were in electronic and now Malaysia supplies approximately 10% of the world's semiconductors (Farole, 2011). This initiative targeted different segments of the economy and in the process led to the development of a full open Malaysian economy (Parliamentary Monitoring Group, 2013). Other countries around the world also implemented their own different forms of SEZ, namely (Farole, 2011):

- In 1965, Taiwan-China and India launched their novel EPZs named Kaohsiung and Kandla respectively;
- India opened the Santacruz zone in 1973, this was followed by South Korea in 1971 with its first zone, Masan. Malaysia, Indonesia, the Philippines, Singapore, Sri Lanka, and Thailand all developed zones in the same period.

- In Latin America, Colombia, and the Dominican Republic where early adopters in 1964 and 1965 respectively, followed by Guatemala, El Salvador, and Honduras in the 1970s. Nicaragua also created its own zone in 1976 followed by Jamaica in the 1976 and Costa Rica in 1981; and
- In Africa, SEZ started in the 1990s and 2000s even though variations of the current SEZ existed before in the 1970s in countries like Liberia and Mauritius (Zeng, 2015).
- The Middle East and North Africa developed their first zones between the 1960s and 1970s, notably in Tunisia, Israel, Syria, Egypt, and Jordan (Farole, 2011).

The most successful SEZ globally are those that have been instrumental in supporting industrialisation and have also been able to successfully integrate into global economy through trade flows. This has been achieved by their ability to transform themselves from spatially distinct environment into drivers of economic change in their host countries (Altebeker et al, 2021). Table 2.1 shows different SEZs according to regions and countries, indicating their number per selected country, and general goods produced and services provided.

Table 2.1: International Special Economic Zones

Region	Country	Number	Good and services produced
Developing Asia	China	2543	Apparel, electronics, electrical, food processing, jet engine repair, biotechnology, information technology
	Philippines	528	Manufacturing computer parts, chips, transformers, industrial cables, tourism, semiconductors, automotive parts,
	India	373	Textiles, electronics, jewellery, leather, food processing, software
Latin America and Caribbean	Dominican Republic	73	Apparel, healthcare products, pharmaceuticals, electronics, medical devices, agroindustry, jewellery and tobacco sectors, services (call centres) business processing outsourcing
	Nicaragua	52	Textiles, apparel manufacturing, Agri-industry, Automotive wire harness,
	Costa Rica	49	Semiconductors, electronics, medical supplies, Agri-industry, pharmaceuticals, business processing outsourcing

Region	Country	Number	Good and services produced
Developing Africa	Kenya	61	Textiles, apparel, hospitality, steel and iron, fertiliser, leather processing, agro-processing, motor-vehicle assembly and spare parts, machine tools and machinery, business processing, e-commerce
	Nigeria	38	Wood processing, food processing, apparel, leather production, textiles oil and gas.
	Ethiopia	18	Textile, apparel & footwear, agro- processing, leather
Transitional Economies	Russian Federation	130	Vehicles, machines and components, energy equipment, electronic devices, agricultural and construction equipment, pharmaceuticals, petrochemicals, medical equipment and devices, IT & telecoms, Consumer goods, Precision instruments industry, metal working, tourism, research laboratories, aircraft production service and repair, Nanotechnology, Biotechnology
	North Macedonia	15	Automotive, electronics, plastics
	Serbia	14	Trading, electrical machinery, food processing, electrotechnics, plastics, petroleum, automotive, rubber-pneumatics, metal works
North America	United states	262	Electronics, petroleum, automotive
Eastern Europe	Poland	21	Automobiles parts, furniture, machinery, printing, wood processing, paper rubber, plastic products, research and development services, household equipment, aviation, electrical and optical devices, paper, pottery, metals, electric devices
	Lithuania	16	Electrical, automotive components, food processing

(Sources: FIAS, 2008; World Bank, 2012; Newman and Page, 2017; Association for the Development of Clusters and Technology Parks of Russia, 2020; Organisation for Economic Co-operation and Development, 2017; Tang, 2019; UNCTAD, 2019; Medina, 2020; and Kenya SEZ Authority, n.d.)

The Chinese SEZs have had the biggest impact, nationally and internationally leading to China becoming the world's leading recipient of FDI between 1979 and 1995 and largest exporter of manufactured goods (Farole, 2011). Zeng (2015) further mentions the key lessons that lead to the success of Chinese SEZ which can be applied to different regions:

- Using SEZ to address market failures or binding constraints that cannot be addressed through other options;
- A sound legal, regulatory framework and effective institutions with long term government commitment, SEZ should be part of the national and regional development strategy;
- The programs must be built on local strengths and should depend on the local comparative and competitive advantage;
- Adopting the suitable development models through strategic planning and industrial positioning;
- Creating a better business environment within the zone such as one stop shops for administration and infrastructure;
- A realistic scheme of starting small and implementing workable strategies for one or two zones then ramping up from there;
- Skills training, technology transfer and implementation; and
- Better linkages with the economy through incorporating local supplies into the value chains.

2.5.2. Special Economic Zones Related to Mining

In the mining industry, there has been a few regions that have developed mining business clusters to support the industry. The two notable ones are the Sudbury business cluster in Canada and the Antofagasta Mining Cluster in Chile. Sudbury is home to the mining supply and service cluster situated in and around the town of Sudbury in Canada. Robinson (2006) stated that the Sudbury Cluster developed independently to meet the growing demands from the mining companies in the region. The Sudbury business cluster is composed of (Robinson, 2006):

- 13 mines operated by 3 companies;
- Smelting and refining facilities;
- Mining suppliers and service providers;

- Education and training facilities consisting of 3 postgraduate institutions; and
- Research and development institutions that support the mines, processing facilities and suppliers.

The Canadian mining industry since the 1970s has seen a decline in direct mining employment with the introduction of new technology, but employment has been offset by growth in firms that supply the mining industry (Robinson, 2004). He estimated that the cluster had 6000 people employed between mining and exploration companies and a further 8000 employed by mining suppliers service providers. Robinson (2006) also mentioned that Sudbury could develop and sustain an economic base due to:

- The size and distribution of the orebodies;
- The presence of big mining companies that attracted world class suppliers, specialised skills and knowledge in the area;
- The emerging exploration activities in the town as well as its close ties with Laurentian University; and
- Easy entry to the Western Quebec mining area where supplies could also form linkages with the mines.

The Sudbury Clusters subscribe to the Schimtz and Musyck theory that clusters develop spontaneously due to the integration of market forces at a local level (Schimtz and Musyck, 1994). However, business cluster development can also be done through a deliberate effort to accelerate growth in economies where business clusters have not developed spontaneously. The SEZ initiative can be used as a mechanism to develop those clusters since Special Economic Zones are delineated areas specifically zoned for development. Clusters can be developed within the SEZ hence subscribing to the Cowdling and Sugden second theory that clusters develop because of government policies and interventions.

Another important business cluster worth mentioning is the Antofagasta Mining Cluster in Chile. Mining in Antofagasta started in the 1860s and had been the major contributor

to the GDP of the region ever since (Lagos and Blanco, 2010). Mining clusters in Chile were formed when multinational corporations started operating in the 1970s which relied heavily on outsourcing (Lagos and Blanco, 2010). The mining cluster had the second highest level of direct and indirect employment effect in the region and that small, medium, and micro-sized companies absorbed about 97% of the workforce in Antofagasta (Culverwell, 2000). Small and medium companies have a part to play in deepening the industrial base since they cater for local markets and promote linkages with other sectors thereby dispersing economic development. In addition to creating employment, they make use of the local skills and materials to train the labour force. The Antofagasta Mining Cluster can be divided into two sub-clusters, namely (Culverwell, 2000):

- Large, specialised national and international suppliers that are focused on competitiveness; and
- Small and medium non-specialised suppliers that are focused on regional development.

These two sub-clusters did not work in isolation but shared support institutions, suppliers, and large mining companies (Culverwell, 2000). The focus in the industry then was on mechanisation and automation, with threats of eventually leading to unskilled labour being no longer required. Lagos and Blanco (2010) mentioned that the public policy should have been oriented towards diversifying and transforming the mining cluster to develop other areas of the economy to maintain a sustainable economy even if mining investment decreased in the region. The mining clusters in Antofagasta highlighted the importance of having small and medium size companies because of their ability to absorb unskilled labour.

The Antofagasta Mining Cluster developed spontaneously initially but in order for it to grow, the government policy was used as an enabler since it offered support to the initiatives within the cluster to ensure its success and longevity. This underscored the significance of having the right market and policies in place that are conducive to stimulate growth in the small and medium business sector.

It then be said that in the mining regions that have failed to develop mining clusters spontaneously, it is up to government to come up with initiatives that will offer a conducive environment to encourage entrepreneurship, innovation and ultimately diversification of the economy. SEZs are the ideal vehicle to foster entrepreneurship, innovation, and skills training that will eventually have spill-over effects into the rest of the economy.

2.5.3. Policy Instruments for Establishment of SEZs in South Africa

South Africa has sound development policies in place such as the SEZ Act No. 16 of 2014, IPAP, NIPF and NDP. The SEZ Act No.16 of 2014 Act was promulgated with the aim of promoting, operating, and managing SEZ. The Act states that SEZ are used as economic development tools to advance national economic growth by utilizing support measure to attract domestic and foreign investment as well as technology (Government Gazette, 2014). The Act further mentions that SEZ are established for the purposes of (Government Gazette, 2014):

- Enabling the formation of industrial complexes;
- To put in place infrastructure needed to assist in the development of selected industrial activities;
- Supplying the area for the setting up the earmarked investments;
- Facilitating the beneficiation of mineral resources;
- Promoting integration of local industry and increase in technological capacity to increase value-added production;
- Promote regional development that is aligned with the country's/provincial growth strategies and local economic development;
- Broadening economic participation by assisting small, micro and medium enterprises and cooperatives as well as advocating for skills and technology transfer; and
- Initiation of innovative economic ideas.

The SEZ Act No. 16 was developed to position the industrial parks in line with the goals articulated in the National Development Plan (NDP). The NDP aims to have a society that grows an inclusive economy, builds capability, and enhances the ability of the country to solve economic development challenges (National Planning Commission, 2012.) Several outcomes of the NDP that link to SEZ include:

- Adequate employment by means of inclusive economic growth;
- A capable and skilled labour force to bolster up the inclusive growth path; and
- A systematic, competitive economic infrastructure system.

The SEZ Act also makes provisions for the formation of the SEZ Advisory Board and for the setting up of the SEZ fund. The SEZ Board is composed of 15 people appointed by the Minister of the Department of Trade and Industry (DTI). The Advisory board includes members from the DTI, SARS, Treasury, IDC, Public Enterprises, organised business, civil society, and labour. The functions of the advisory board are (Government Gazette, 2014):

- Advise the Minister of Trade and Industry on the policy and the strategy to develop, promote, operate and manage SEZs;
- Monitor the execution of the SEZ strategy and policy;
- Consider applications for the designation of SEZ or application of operator permit and suggest to the Minister to approve application or grant SEZ licence/operator permit;
- Cooperate with the Special Economic Zone Board and operators on the execution of the SEZ strategic plans; and
- Assess and review the success of a SEZ.

The SEZ fund mentioned in the Act may be established to aid the promotion and development of a SEZ. The money within the fund is appropriated through the DTI if voted upon by the Minister of Finance as well as Parliament. The Public Management

Act is used to administer and manage the SEZ fund (Goverment Gazette, 2016). The money within the funds may be distributed for (Government Gazette, 2016):

- Feasibility studies to aid the establishment, planning and development of a SEZ;
- Start-up costs related to setting up the SEZ including but not limited to accountants, legal fees, registration charges, marketing costs and employee training;
- Site preparation necessary to enable business to locate within the SEZ;
- Infrastructure expansion within the SEZ;
- Business development and performance management such as initiatives to improve supplier and supply chain competitiveness, environmental impact improvement, utility and maintenance costs;
- Skills development programmes and initiatives.
- Initiatives to assist industrialisation and economic growth aligned to the SEZ policy and strategy; and
- Business incubators that deliver services to Small Medium Enterprises (SMEs).

An area may be designated to be a special economic zone if an application is lodged in writing by national government, provincial government, municipality, public entity, public private partnerships to the Minister of the DTIC. The applicant must demonstrate in his/her application that the SEZ will further the national governments industrial objectives (Government Gazette, 2014). The Minister himself/herself may also designate an area to be a Special Economic Zone if he/she sees it as a strategic national interest and may authorise SEZ and publish criteria, guidelines, and conditions for the SEZ which may include (Government Gazette, 2014):

- Free port;
- Sector development zone;
- A free trade zone; and
- Industrial development zone.

The Minister of the Department of Trade and Industry in discussion with the Minister of Finance will determine the kind of businesses and services that may be in the SEZ. Upon establishment, the SEZ must be governed and managed by the Special Economic Zone Board responsible for the day-to-day business affairs in accordance with the Public Finance Management Act, Municipal Systems Act and the Municipal Finance Management Act (Government Gazette, 2014).

The Special Economic Zone Board will also be responsible for developing the strategic plan that complies with the Special Economic Zones strategy set by the Minister in terms of Section 6 of the SEZ Act. An operator may be appointed by the board to develop, operate, and manage the zone on their behalf. Businesses or service operators who want to operate in a SEZ must ensure that the business is in accordance with the list of permissible businesses set by the Minister of the DTI in terms of Section 24(4) of the SEZ Act and has all the required licences, permits and business plan for its operation (Government Gazette, 2014).

2.5.4. Local SEZ Landscape

South Africa had elements of the SEZ existing since the 1980s under the apartheid government. They differ from the classical SEZ model since they were focused on decentralising national industry to prevent influx in the urban areas from the Bantustans as opposed to being export focused (Zbigniew et al., 2013). Some of these policies include (Zbigniew et al., 2013):

- Certain areas were declared free from national laws pertaining to conditions in the workplace;
- Import tariffs were reduced in 1988 for inputs into the clothing, textile, and motor vehicle industries by introduction of liberal laws; and
- Industrial decentralisation which allowed government to grant subsidies and concessions to companies which were willing to invest in Bantustans.

In the post democratic South Africa, the SEZ programme was initially established in the form of the Industrial Development Zone (IDZ) programme in the early 2000s. The IDZ programme was developed with the objective of drawing local and foreign direct investment in specific geographical areas. Originally five IDZs were established in SA namely Coega, East London, Richards Bay, Saldana Bay, and Dube Trade Port. (Department of Trade and Industry, n.d.).

However, due to the limited success of the IDZ, the programme was reviewed to include an expanded SEZ provision that includes the comprehensive policy framework. This culminated into the Special Economic Zone bill which was later promulgated into law as the SEZ Act. The following factors were used to come up with a coherent policy framework for the development, design and operation and management of IDZ namely (Department of Trade and Industry, n.d.):

- Changes in the national economic policies and strategies;
- Growing competition for FDI and a change in global economic power balance from the West to the East and well as the formation of Brazil, Russia, India China and South Arica (BRICS). SEZs are seen as important tools in growing economies within the BRICS nations;
- Coordination across all government departments is important for the successful execution of the SEZ policy; and
- SEZs cannot work in isolation but require a clear strategic industrial strategy as well as investment opportunities.

The original five operational IDZs mentioned above were converted into SEZs in order to provide more structure and governance after the promulgation of the SEZ Act. This legislation enabled the development of different types of SEZ as per the national development priorities and regional development needs (Bernstein, 2012).

To date South Africa has 11 operational SEZs as shown in Table 2.2. The Department of Trade Industry and Competition (2021) reported that Coega SEZ in 2021 accounted for more than half of the investments in SEZ followed by East London Special

Economic Zone (ELSEZ) and Dube Trade Port which accounted for 20% and 10% respectively.

Table 2.2: Operational Special Economic Zones in South Africa

Name	Location (Province)	Designation Date	Good and services	Jobs created	Operational Investment (R Million)	Comments
Coega SEZ	Gqeberha (Eastern Cape)	2001	Automotive, agro-processing, aquaculture, logistics, business process services and energy metals	8113	10 941,00	Largest SEZ in South Africa
East London SEZ (ELSEZ)	East London (Eastern Cape)	2003	Renewable energy, automotive, aquaculture, agro processing manufacturing, ICT, and electronics manufacturing	2075	4 177,00	Home to largest automotive supplier park in SA. It also houses a metal surface treatment facility (aluminium treatment and e-coating)
Richards Bay	Richards bay (KwaZulu Natal)	2002	Metals beneficiation (iron ore, aluminium, and titanium) renewable energy (fuel cell & biomass, solar), port optimisation (oil & gas, ship building & repair), agro-processing and ICT (techno-parks and innovation hub)	96	320,00	None
Saldanha Bay SEZ	Saldanha Bay (Western Cape)	-	Logistics services, gas, oil and marine repair engineering	57	119,50	Vessel servicing and maintenance, marine repair, fabrication and logistics capabilities to service upstream marine oil and gas exploration
Dube Trade Port SEZ	Durban (KwaZulu Natal)	-	Warehousing, manufacturing, assembly of goods, agri-lab and agri-zone	3794	2 078,80	Also hosts an agri-zone which is a high-tech family facility that has the continents largest climate controlled growing area. The agri-lab specialises in tissue culture, flowers and plants, greenhouse
OR Tambo	Johannesburg (Gauteng)	2014	Beneficiation of diamonds, precious, and semi-precious	1200	257,00	Situated near OR Tambo International

Name	Location (Province)	Designation Date	Good and services	Jobs created	Operational Investment (R Million)	Comments
			metals and manufacturing (light high margin)			Airport. Industrial precincts to be developed in the next 10-15 years
Atlantis SEZ	Cape Town (Western Cape)	2011	Green manufacturing hub focusing on renewable energy technologies (solar panels, wind turbines, biofuels), , electric vehicles, materials recycling, green building materials and insulation	332	680,00	SEZ started in Cape Town as per the Renewable Independent Power Producer Programme (REIPP)
Tshwane Automotive SEZ (TASEZ)	Tshwane (Gauteng)	-	Automotive manufacturing, logistic and freight support	1259	4 200,00	First automotive city in Africa.
Maluti-a-Phofung SEZ	Harrismith (Free State)	2017	Light and medium manufacturing, agro-processing, agglomerations, storage and logistics for agricultural products	80	1 025,00	Location at the midpoint of the Johannesburg-Durban logistics route

(Sources: Department of Trade, Industry and Competition, 2020; Department of Trade, Industry and Competition, 2022)

The designated SEZ in Table 2.3 have not yet started construction and the five SEZs that are going through the application process are listed in Table 2.4. This process is coordinated by the provincial development agencies. The two PGM SEZ namely Bojanala and Fetakgomo-Tubatse are classified as proposed SEZs as their application is currently in progress.

Table 2.3: Designated SEZs that are yet to start construction.

Name	Location (Province)	Designation year	Good and services proposed	Total size (ha)	Estimated investment value	Location
Nkomazi	Mbombela (Mpumalanga)	2019	Agro-processing, warehousing, logistics	155	R 1,073 billion	Between Mpumalanga (South Africa), Swaziland and southwestern Mozambique
Musina/ Makahdo	Musina (Limpopo)	2018	Light industrial manufacturing, agro-processing, Metallurgical beneficiation, petrochemicals	7 262	R840 billion	Situated around the N1 North-South route close to the borders of Zimbabwe and South Africa.

(Sources: Department of Trade, Industry and Competition, 2020; and Department of Trade, Industry and Competition, 2021)

Table 2.4: Proposed SEZs in South Africa

Name	Location (Province)	Proposed Services and goods	Status	Next steps
Namakwa SEZ	Aggenys (Northern Cape)	Mineral Processing	• Business case completed • SEZ operator company appointed • Opex funding secured from the province	• EIA finalisation • Investment pipeline consolidation
Wild Coast SEZ	Mthatha (Eastern cape)	Agro-processing and tourism hub	• Feasibility studies completed • Commitment of R116 million from the province • Investment of R1.4 billion signed	• Land preparation • Infrastructure roll-out
Fetakgomo-Tubatse SEZ	Burgersfort (Limpopo)	PGM beneficiation and mining input supplier park, solar energy generation, pharmaceutical plan, food technology centre, warehousing and storage	• Feasibility study completed	
Bojanala SEZ	Rustenburg (Northwest)	PGM beneficiation (catalysts, electrical and electronics, biomedical and pharmaceutical products, high performance alloys, fuel cells and jewellery) and mining input supplier park, renewable energy components and logistics	• Business case completed	• Revision of business case • Cabinet approval pending • Consolidation of investment pipeline • Clarification of roles and responsibilities between national, province and local municipality
Vaal River City	Whole Sedibeng district municipality to be designated as SEZ (Gauteng)	Logistics, Manufacturing	• Planning and design phase	• Setting up of the project management unit (PMU) • Merging of key projects • Generation of business case • Development of SEZ masterplan

(Sources: Department of Trade, Industry and Competition, 2020, and Limpopo Economic Development Agency, 2021)

The Fetakgomo-Tubatse SEZ will be hosted in the Sekhukhune district in the Fetakgomo-Tubatse Local Municipality (FTLM) in the Eastern Limb of the BC. The earmarked land for this SEZ is near the town of Steelport and is 1220 ha in size and shares boundary with the existing Glencore mining input supplier park (Department of Trade, Industry and Competition, 2020, and Limpopo Economic Development Agency, 2021) The area is home to around 40 operating mines, including eight PGMs mines.

The Bojanala SEZ will be hosted in the Bojanala district in the Moses Kotane Local Municipality (MKLM) in the Western Limb of the BC. The earmarked land for this SEZ

is near the town of Mogwase and will be within the 100ha Bodirelo Industrial Park (Development Bank of Southern Africa Limited, 2021).

The DTIC, which is the custodian of the South African Industrial Policy, has conducted a review of the SEZ performance to determine the key success factors in order to improve the performance of future SEZs. The identified key success factors are (Department of Trade, Industry and Competition, 2020):

- Clearly defined value proposition
- Clear long-term plans
- Effectives Stakeholder engagement
- Clear and stable governance systems
- Competent and qualified board appointment for the SEZ

As a response to this performance review, the DTIC has reconfigured the SEZ programme to involve its office in the planning and management of SEZs instead of leaving the responsibility thereof to the provinces (Department of Trade, Industry and Competition, 2021). This will be done in order to address the implementation challenges faced by the provinces and also alleviate the port challenges which currently exist at national level. Some of these port challenges include lack of investment in maintaining and upgrading the port, roads, and rail networks, reliability, and availability of equipment as well as theft and vandalism (Bruyns, 2022; Sihlobo, 2019). It can be envisioned that this provisions will be extended to all SEZ irrespective of their geographic location or product and/or service offering.

The current SEZ framework was implemented in 2020 and will be in place until 2030, with the focus on the following elements (Department of Trade, Industry and Competition, 2021):

- SEZ to be developed and anchored on the district development model, which involves all three spheres of government (national, provincial and district), sector departments and state entities working together to deliver service and

high impact developmental outcomes (Cooperative Governance and Traditional Affairs, 2020a);

- National government to take part in the planning, development and management of zones and establishment of the Project Management Unit (PMU) to provide technical support to SEZ;
- Development of strong investment pipeline prior to designation through the participation of the private sector from SEZ inception and also funding commitment from all government spheres;
- Collaborative planning and development across all three areas of government (national, provincial, and local) to fast-track approval process;
- Clear long-term plans through 30 to 50-year horizon master plans which include education, skills, business incubation; and
- Introduction of a new category, namely District SEZ in terms of section 24 (2) of the SEZ Act to accelerate the establishment and sustainability of industrial hubs.

The DTIC has identified the Bojanala SEZ and Fetakgomo-Tubatse SEZ as the key priorities as from 2021. The two SEZs have been earmarked to receive additional assistance from the DTIC and the SEZ Programme Management Unit. The latter was established within the Investment Development Corporation (IDC) to (Department of Trade Industry and Competition, 2021: p14):

- “Assist the DTIC to perform its role of being an active participant in the planning, development and management of industrial parks and SEZs;
- Support municipalities and provinces by providing advisory services in order to accelerate the planning, design, development and management of industrial parks and SEZs;
- Assist the DTIC to integrate and coordinate insights from the various spheres of government to ensure alignment and synergies; and

- Safeguard the inclusion of social, environment and economic sustainable development impact measures and inclusion and transformation agenda is considered in the implementation industrial parks and SEZs."

2.6. Chapter Summary

The economic development theories mentioned in this chapter demonstrate that there is no universally accepted theory of development, instead there are continually developing strands of thought on how to achieve and sustain economic growth. It is also worth noting that developing countries are vastly different in structure and organisation to developed countries therefore the policy principles and behavioural assumptions of traditional neoclassical theory are often impractical. This is due to the lack of competitive free markets generally in developing countries due to the institutional, cultural, and historical context they find themselves in. This means that development efforts need to be based on the assessment of each individual country's situation and also requires sensible and skilful balancing of market promotion and pricing where markets can operate effectively along with well formulated government policies and interventions to facilitate the development of markets and growth. Some of these policies include industrial policies.

South Africa has had a myriad of development policies since the inception of democracy in 1994, to date the country is using the National Development Plan as its guiding document. The NIPF and its implementation plan (IPAP) are both are aligned to the country social and economic agenda which is highlighted in the National Development Plan 2030 document. Coordination is critical amongst the various government departments such as the Presidency, National Treasury, DTI, the Economic Development Department, Public Enterprises, Department of Science, Technology and Innovation, and the Department of Transport in order to successfully deliver on the transversal focus areas outlined in the IPAP. The country's beneficiation strategy launched during the New Growth Path era is not a broad approach but only focuses on forward linkages of minerals into higher value products. The backward and side stream linkages which are covered in the Mining Charter through procurement,

enterprise development, human resource development (HRD) and research and development.

SEZs are the ideal vehicle to foster entrepreneurship environment, innovation and skills training that will eventually have spill-over effects into the rest of the economy. There are two notable regions that have been able to foster business cluster in mining areas namely Sudbury business cluster in Canada and the Antofagasta Mining Cluster in Chile. The Antofagasta Mining Cluster developed spontaneously initially but for it to grow, government policy was used as an enabler to offer support to the initiatives within the cluster for its success and longevity. In mining regions that have failed to develop mining clusters spontaneously, it is up to their respective governments to come up with initiatives that will offer a conducive environment to encourage entrepreneurship, innovation and ultimately a diversified economy.

SEZs have been in place globally since the 16th and 17th century although the first modern day SEZs started in Asia and Latin America. These modern day SEZs were and are used as instruments to promote foreign direct investment, industrialisation, and sustainable economic growth. These zones come in different forms such as free trade port, export processing zone, free enterprise, special economic zones and hybrid export processing zones. The most successful SEZs are integrate into global economy through trade flow.

In terms of mining there has been a few regions that have developed mining business clusters to support the industry. The two notable ones are the Sudbury business cluster in Canada and the Antofagasta Mining Cluster in Chile. South Africa has implemented the SEZ programme with the hope of realising the vision espoused in its beneficiation strategy, using the SEZ Act No.16 of 2014 Act as a policy instrument. To date South Africa has 11 operational SEZs, two designated but yet to start construction and five still undergoing the application process. The two PGM SEZ, namely Bojanala SEZ and Fetakgomo-Tubatse are part of the five SEZs still undergoing application process.

The Fetakgomo-Tubatse SEZ will be hosted by the Fetakgomo-Tubatse Local Municipality in Sekhukhune Districts in the Eastern Limb of the BC. The Bojanala SEZ will be hosted by the Moses Kotane Local Municipality (MKLM) in the Bojanala District

in the Western Limb of the BC. The DTIC has identified the Bojanala SEZ and Fetakgomo-Tubatse SEZ as the key priorities as from 2021. The two SEZs are the subject of this research and in that respect, Chapter 3 discusses the approach taken in this research.

3. RESEARCH METHODOLOGY

3.1. Introduction

The purpose of this chapter is to describe the research approach, research design, data sources, data analysis and research validation. The data obtained cover economic dynamics of Sekhukhune and Bojanala Districts in the Limpopo and North West Provinces in South Africa to determine if a PGM SEZ can be developed successfully therein and be used as an tool to increase the mining industry's contribution to the South African economic development.

3.2. Research Approach

The research methodology is an important aspect of research, it explains the procedure which the researcher aims to go about doing their work (Chivanga & Monyai, 2021). It makes way for the research methods to be conducted properly. Research method is the specific techniques, tools or procedures applied to achieve a given objective (Wits University, n.d.). In other words, these research methods prescribe the data collection technique and tools to analyse data to get to a conclusion.

The research approach can either be quantitative, qualitative, or mixed method. These three research approaches can be further broken down into multiple research design subgroups as seen in Table 3.1. Qualitative research involves reviewing data collected, emerging procedures and questions. Creswell (2014: p. 22) mentioned that "Quantitative research is a means for testing objective theories by examining the relationship among variables". This is then followed by an inductively data analysis process which identifies the emerging themes and enables the researcher to make interpretations and draw meaningful insights from the data.

A mixed methods research approach is a combination of both quantitative and qualitative research (Creswell, 2014). To determine the appropriate research methodology for this research, aspects listed in Table 3.1 were considered and an explanatory sequential mixed method approach combined with case study was

chosen. The case study approach was used to investigate the meanings, key characteristics, implications, and specific real-life ramifications of the subject.

Table 3.1: Research design subgroups

Quantitative	Qualitative	Mixed method
Non-experimental	Narrative research	Convergent
Experimental	Grounded theory	Explanatory sequential
	Phenomenology	Exploratory sequential
	Case Studies	Transformative, embedded, or multiphase
	Ethnographies	

(Adapted from Creswell, 2014)

3.3. Research Design

Research designs are the strategies of investigation within quantitative, mixed methods, and research approaches that dictate the course of action in a research design (Denzin & Lincoln, 2011). A case study is a useful research design when the investigation wants to gain in-depth, concrete, and contextual knowledge about a particular real-world topic. It allows for the exploration of the meanings, key characteristics, and implications of the case. In this research, the design was such that a case study approach was used and supported by quantitative data with a stern focus on the PGM SEZs in South Africa in particular in the North West and Limpopo Provinces.

3.4. Sources Of Data

The information and data for the study was collected from research papers, books, journal articles, conference papers, documents from government agencies, web sites, annual reports, news articles, web blogs and published statistics from research organisations. The literature survey and other existing data sources have assisted in

positioning the study in the current body of work and to assess trends within the bounds of the research topic. In particular, apart from economic development theories and policy aspects, the literature survey looked firstly, at international SEZs in 15 countries and the different sectors of specialisation. Secondly, South African SEZs where examined looking at location, designation, goods and services, jobs, and investment value. The lessons learnt globally and locally in South Africa were used to assess if either Bojanala or Fetakgomo-Tubatse SEZ in the BC is likely to succeed, taking into account their proximity to manufacturing and mining services hubs in Ekurhuleni and Johannesburg metropolitans.

3.5. Data Analysis

A thematic analysis was undertaken to analyse the data collected in this research. This thematic analysis was done in the form of a viability matrix which would provide a quantitative view of the Bojanala and Fetakgomo-Tubatse SEZs based on multiple themes or considerations such as SEZ value proposition, regional education level, spatial linkages, and local sector analysis. The data obtained was grouped into these themes/considerations and from that a determination was made with respect to which SEZ is most likely to succeed.

3.6. Research Limitation

In terms of the limitations of the study, the latest socio-economic data (e.g., education and population size) could not be sourced. In addition, some data was collected and categorised in the manner that needed re-interpretation and categorisation for the purpose of this research. It was also not possible to deduce which incentives for the SEZ were being offered by the province and municipality since SEZ data is not readily available in South Africa (or published by zone operation). Data on funding and other discretionary incentives at local, provincial government level are also not reported comprehensively. However, this study based on the available data, is still a valuable exercise that can be used and built upon by policy makers, SEZ developers and researchers.

3.7. Research Validation

Triangulation is a research strategy that is often applied in qualitative research to enhance the validity and credibility of the findings (Jick, 1979). It helps to build a more comprehensive perspective to an investigation question. Data triangulation is one of the four main types of triangulations that has been used for this research. In this case multiple data sources such as different time periods, samples, spaces, and places have been used to answer the research questions. This approach increased the validity of the study. This method has its disadvantages such as being time consuming and labour intensive as inconsistencies in the data require time to figure out which data is correct in case of contradictions.

3.8. Chapter Summary

The research methodology covered in this chapter includes the research approach, research design, data sources, data analysis and research validation. An explanatory sequential mixed method approach and case study was chosen as the most appropriate for this research. The focus of the case study was on the Bojanala and Fetakgomo-Tubatse SEZs in South Africa. The sources of data that were looked at include research papers, books, journal articles, conference papers, documents from government agencies, web sites, annual reports, news articles, web blogs and published statistics from research organisations.

In terms of data analysis, a thematic analysis was used to interpret the literature review, case studies, and other secondary data cited in the study. The research focused at value proposition, regional education levels, spatial linkages, and local sector analysis with respect to the Bojanala and Fetakgomo-Tubatse SEZs. Lastly, data triangulation was used to validate the data obtained. The next chapter delves deeper into the Bojanala and Fetakgomo-Tubatse SEZ case studies.

4. BOJANALA PLATINUM AND FETAKGOMO-TUBATSE SEZ CASE STUDIES

4.1. Introduction

This chapter focuses on Bojanala and Fetakgomo-Tubatse SEZs in the North West and Limpopo Provinces respectively. The two SEZs are at the planning phase, have similar focus, are in adjacent provinces, and both neighbours the economically strong Gauteng Province.

4.2. Bojanala SEZ Case Study

This section will provide a regional profile of the Bojanala SEZ. The information will cover a discussion on the socioeconomic profile, sector analysis, and spatial linkages within the district.

4.2.1. Socio-economic Profile

The Province of North West is located in the north-western part of South Africa, and it forms the border between Botswana and South Africa. The province has an estimated land area of 116 180 km^2 and a population size of 4.1 million people. The population size is an important measure since population growth directly or indirectly impacts employment or unemployment rate and economic growth of the region (Rustenburg Local Municipality, 2022).

The North West province has four district municipalities (Bojanala, Dr Ruth Segomotsi Mompati, Ngaka Modiri Molema, and Dr Kenneth Kaunda) and 21 local municipalities, with the Bojanala Platinum District Municipality having the biggest population size of 1.81 million people which represents 44.1% of the sum total of the provincial population (Cooperative Governance and Traditional Affairs, 2020a). The Bojanala District is neighbouring the Gauteng Province on the east, the Limpopo province on the north, as well Ngaka Modiri Molema and as Dr Kenneth Kaunda and these are on the west and south respectively as shown in Figure 4.1.

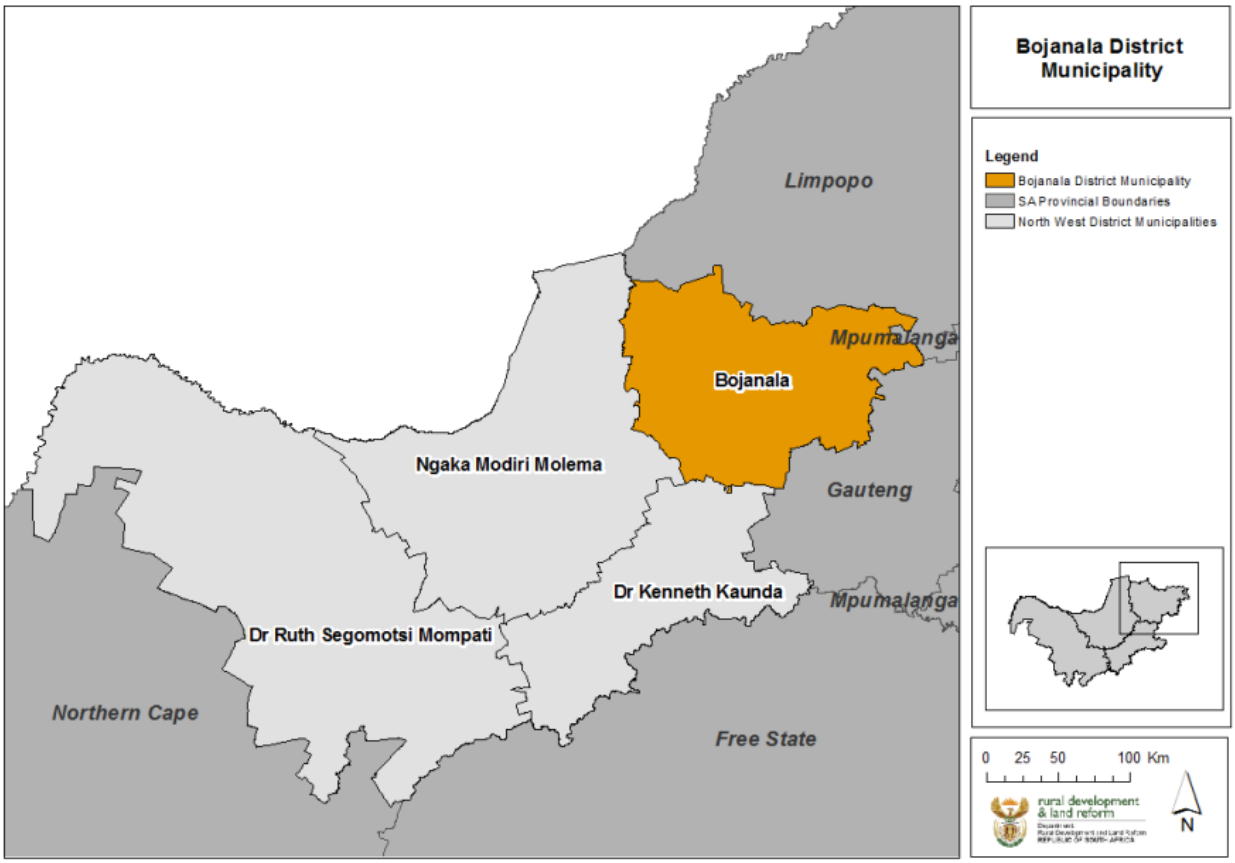


Figure 4.1: Bojanala Platinum District Municipality location (Bojanala, 2022)

The Bojanala District has five local municipalities namely Moses Kotane Local Municipality (MKLM), Kgetleng Rivier Local Municipality (KRLM), Moretele Local Municipality (MLM), Madibeng Local Municipality (MaLM), and Rustenburg Local Municipality (RLM) as shown in Figure 4.2.

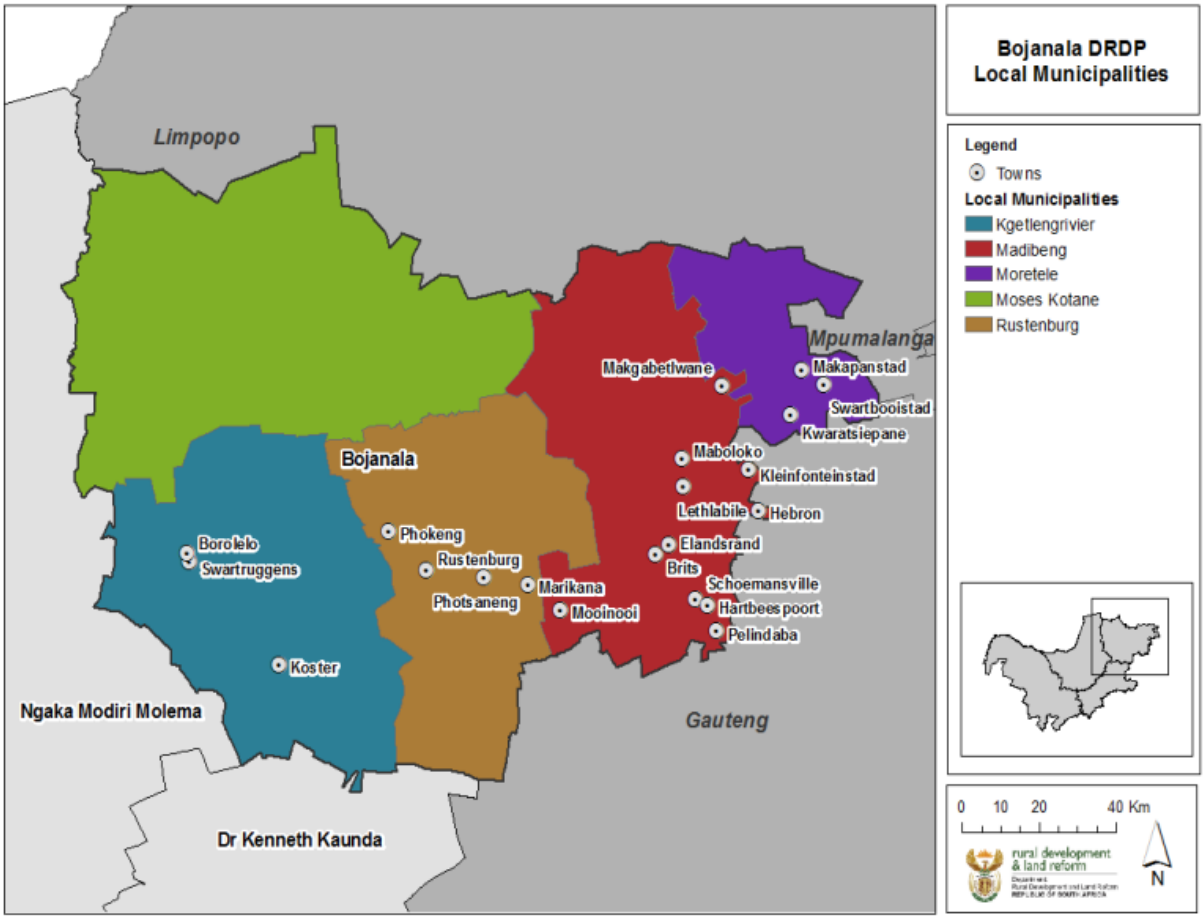


Figure 4.2: Five local municipalities of Bojanala District Municipality (Bojanala,2020)

In 2022, the RLM was noted to be the most populous of the five local municipalities with an estimated population of 719 049 which is 38.2% of the district population, and MKLM in third place with 269 757 (14%) as shown in Figure 4.3 (IHS Markit Regional Explorer version 2112, 2022, cited in Rustenburg Local Municipality, 2022: p. 22). The MKLM is predominantly rural comprising of 64 villages, two main services towns (Ledig and Moruleng), and three small service towns (Mabeskraal, Mogwase ST, and Seshibitswe) (Moses Kotane Municipality, 2022). The MKLM population statistics are relevant for this report because it has been earmarked as the location of the Bojanala SEZ.

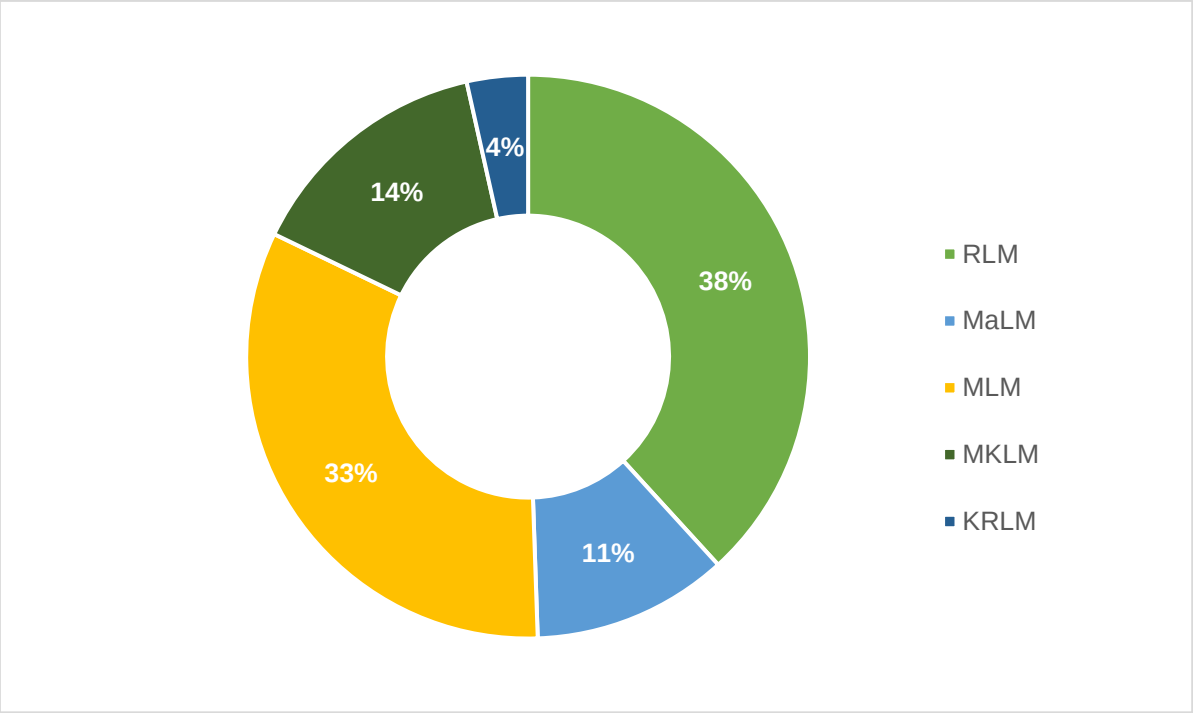


Figure 4.3: Population size for the five local municipalities in the Bojanala District (IHS Markit Regional Explorer version 2112, 2022 in Rustenburg Local Municipality, 2022: p20)

The official unemployment rate of North West Province in 2021 was 35.7 % compared to the country's rate of 34.9% as shown in Figure 4.4. The official unemployment rate takes into consideration the number of active job seekers as a percentage of the labour force, and it is a subset of the expanded unemployment rate. The expanded unemployment rate for the province in 2021 was the third highest in the country at 52.2% after Limpopo and Eastern Cape Provinces (Maluleke, 2021). The expanded unemployment rate includes individual of an economic age (greater than 18 years) that have stopped looking for work.

In 2018, the Bojanala District reported an official unemployment rate of 27.58% (Bojanala, 2022). IHS Markit Regional Explorer (2022), in Rustenburg Local Municipality (2022: p. 58), estimated that official unemployment rate in 2022 could be closer to 35.3%, with the MKLM rate estimated at 42%. The mining industry in the MKLM was the largest employer in 2020 with 22 605 people which represents 38.66% of the total municipal (local) employment (Moses Kotane Local Municipality, 2022).

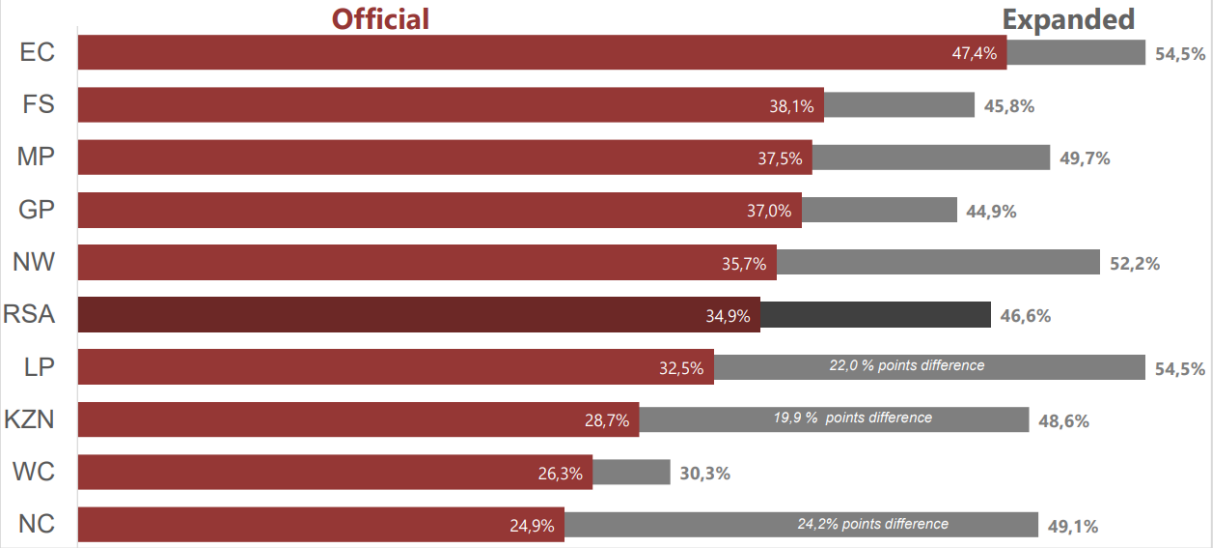


Figure 4.4: Provincial unemployment rate official versus expanded unemployment rate (Statistics South Africa, 2021)

Education is one of many important factors in a country on the path to economic development because it produces skills and human resource for its industries. In 2018, 1.18 million people or 28.7% of the North West Province population aged 20 years and older obtained grade 12 qualification (matric) and 374 700 people or 9.13% had some sort of post school qualification (Selemela, 2020).

In 2016, 108 600 (approximately 6%) of the Bojanala District residents were without any formal education (no schooling), with 700 500 residents (approximately 38.7%) having completed matric (Bojanala Platinum District Municipality, 2021). Moses Kotane Local Municipality (2022), nonetheless, mentioned that 32 100 of the local municipal residents or 11.9% had completed matric in 2022 and only 2427 residents or 0.9% have obtained post school qualifications. In addition, 137 600 residents or 51% were classified as semi-skilled and unskilled in 2022.

4.2.2. Sector Analysis

The major industries in the North West Province are mining, government, trade, and finance and the province contributed 6% to the South African GDP in 2019 (Statistics South Africa, 2019). According to Figure 4.5, the North West Province was the seventh important province in terms of GDP contribution.

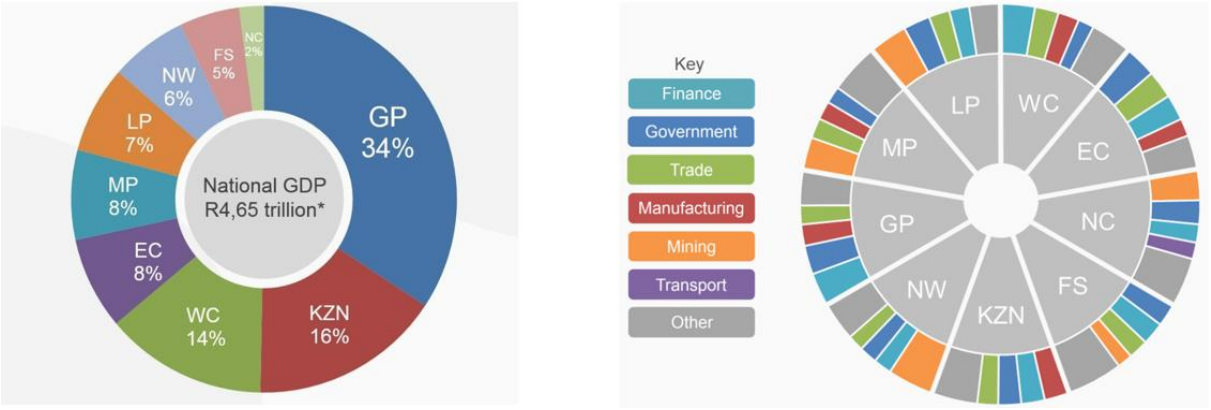


Figure 4.5: GDP contribution and major industries per province (Statistics South Africa, 2019)

The major economic drivers of the Bojanala District are mining, tourism, agriculture, manufacturing, and services industries (Bojanala IDP, 2017). For the five years between 2013 and 2017, Mining contributed 53.7% in 2013, 52.2% in 2014, 50.8% in 2015, 50.33% in 2016 and 50.8% in 2017 to the district GDP (IHS Markit Regional Explorer, 2018, in Bojanala Platinum District Municipality, 2022: p. 33). The GDP contribution of the five local municipalities towards the district's GDP in 2020 is shown in Figure 4.6

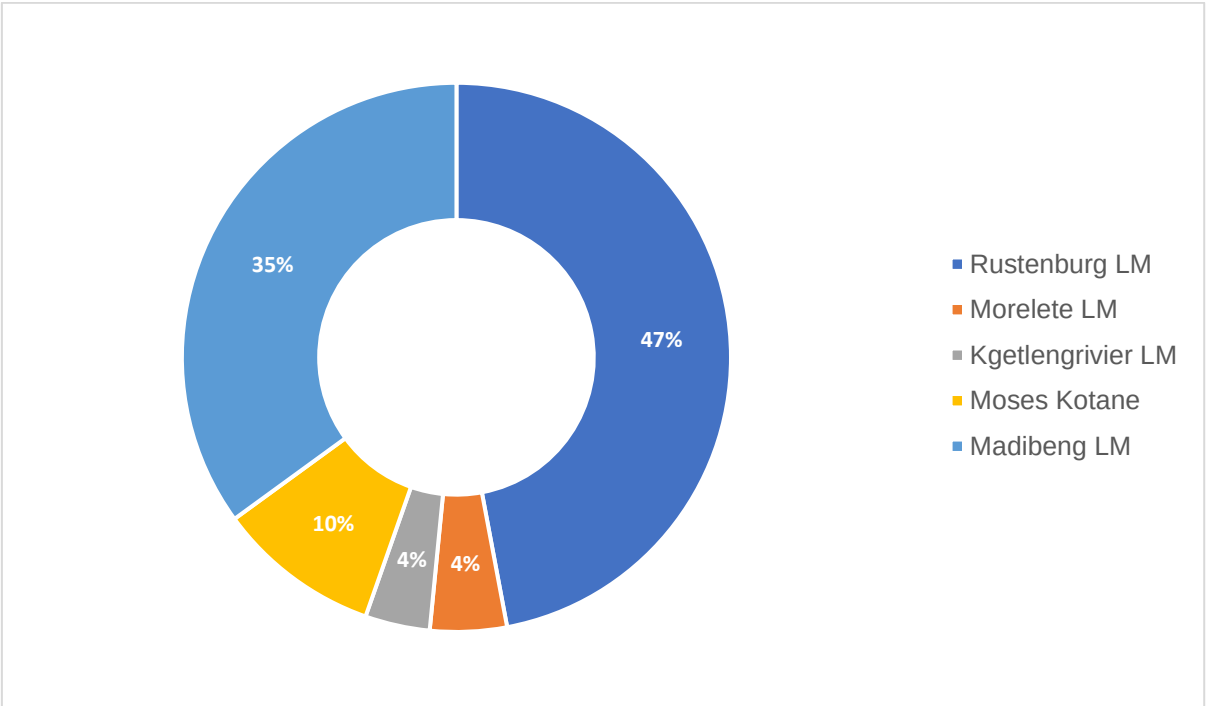


Figure 4.6: Bojanala District Local Municipality GDP contribution in 2020 (Rustenburg Local Municipality, 2022)

The Western Limb of the BC runs through RLM, MKLM, MLM and in 2020 there were 55 mining companies mining a variety of commodities such as slate, diamonds, sand, PGMs, ferrochrome, granite, lime, vanadium, titanium, and iron ore (Cooperative Governance and Traditional Affairs, 2020a). The presence of this large number of mining companies contributes significantly to the employment numbers of the district as shown in Figure 4.7.

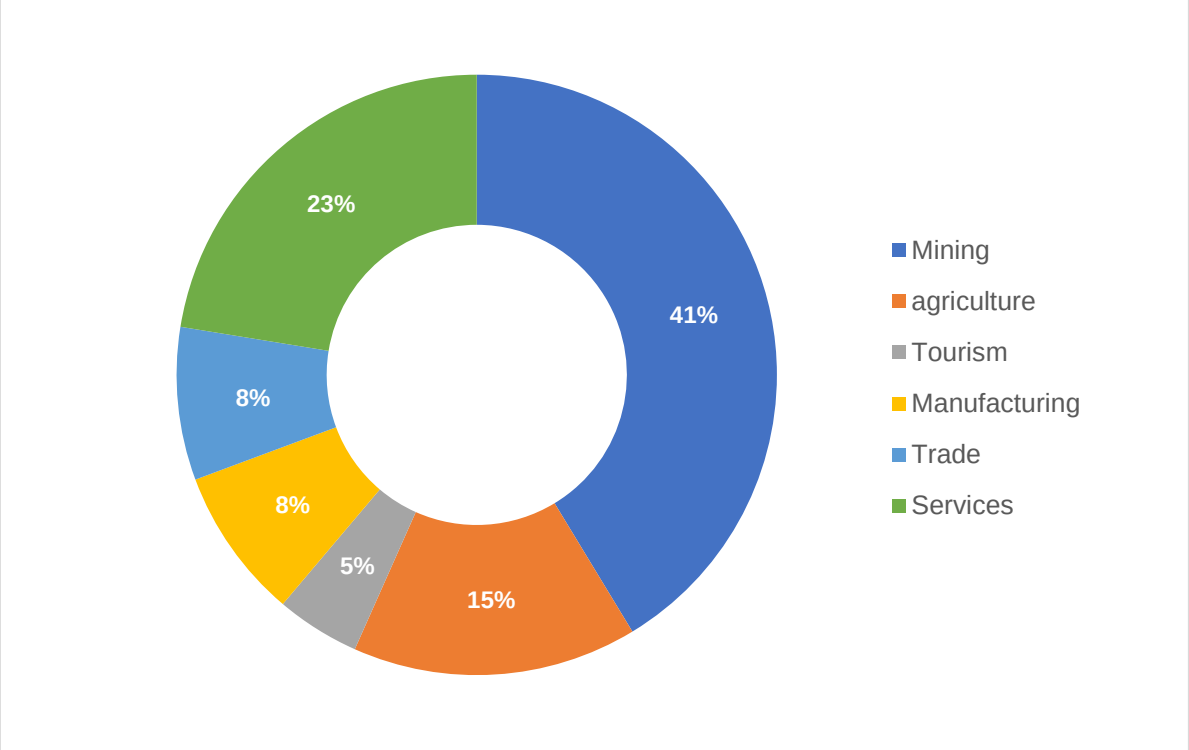


Figure 4.7: Main employment sectors in the Bojanala District in 2020 (Bojanala, 2022)

In the Western Limb of the BC there are currently 11 PGM Mining companies as shown in Figure 4.8. The companies are namely Anglo Platinum, Northam Platinum, Impala, Sibanye Stillwater, Eastern Platinum, Royal Bafokeng Platinum (RB Plats), Wesizwe Platinum, Sedibelo Platinum, Sable Platinum, and Siyanda Bakgatla Platinum. The Bojanala SEZ will be situated near the town of Mogwase.

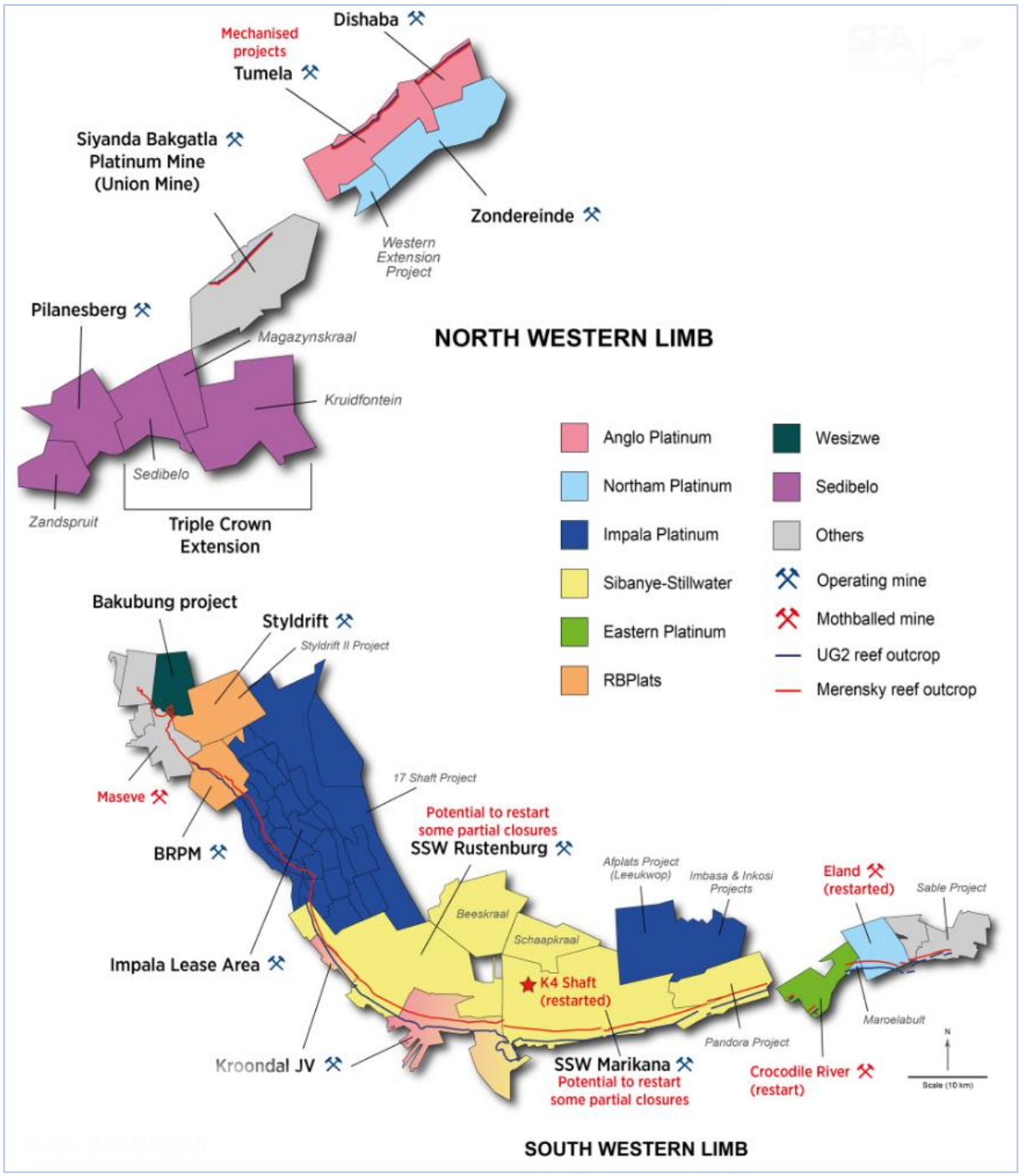


Figure 4.8: PGM mines in the Western Limb of the BC (SFA Oxford, n.d.a)

Furthermore, there are currently nine smelters and refineries in the Western Limb which are owned by several different companies as shown in Figure 4.9., of which, five are smelting operations, three are base metal refineries, and one is a precious metals

refinery. In Figure 4.9 there are various arrows showing the products pathway from the mines to the corresponding smelter or refinery.

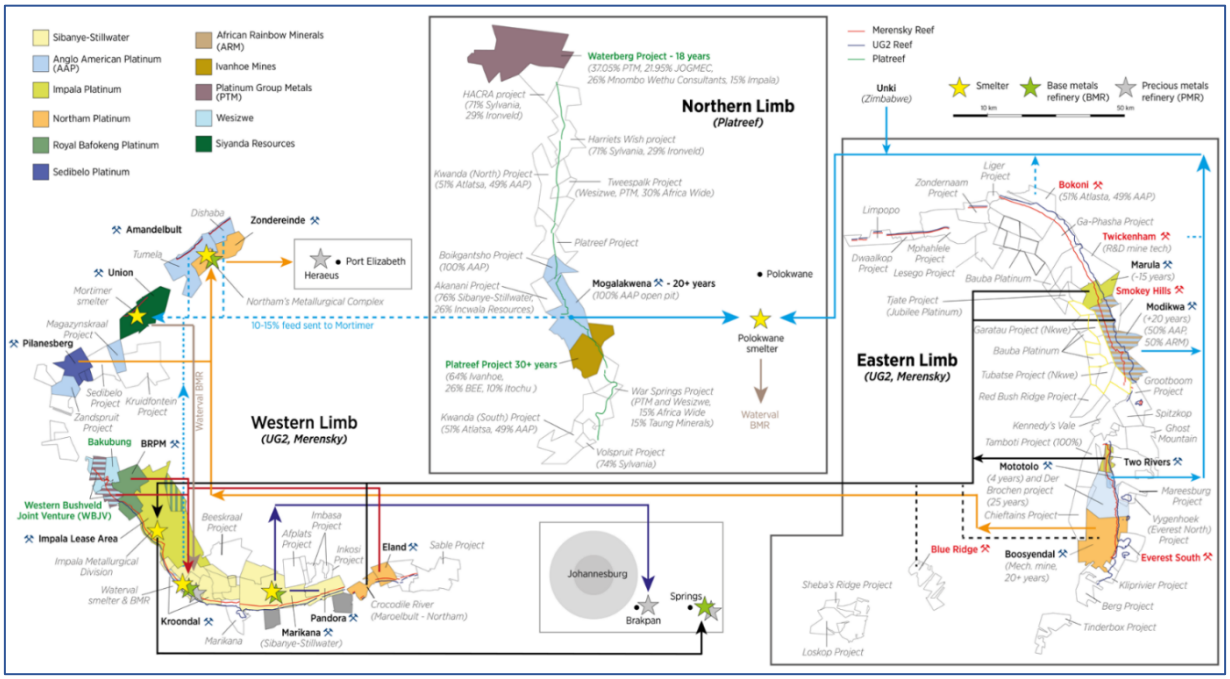


Figure 4.9: PGM processing facilities within the BC (Smelters and Refineries) (Oxford SFA, n.d.b)

The sectors that have been identified for the SEZ in the region include PGM beneficiation (catalysts, electrical and electronics, biomedical and pharmaceutical products, high performance alloys, fuel cells, and jewellery), mining input suppliers, renewable energy components, and logistics. To date the following opportunities and source of funding have been explored as shown in Table 4.1.

Table 4.1: Opportunities identified for the Bojanala SEZ (Bojanala, 2022)

Sector	Description	Projected no. of jobs	Investment value (R)
Renewable Energy	Electricity production from waste products	450	3.9 billion
Capital Equipment	Metal fabrication	176	35 million
	Computer assembly	200	60 million
Mineral Beneficiation	Chromium smelting	150	25 million
	Manufacturing of nitrite fertiliser by using coal to produce urea	To be confirmed	13.8 billion
Mineral Beneficiation/Renewable Energy	Production of Silicon from processing silica to produce solar panels	To be confirmed	2.4 billion
Agro-processing	Drying of Vegetables and Fruits	50	27 million

4.2.3. Spatial Linkages

The roads and various transportation systems in the North West Province are linked to various transportation corridors. The transportation systems (airports, main roads, railway) provides access and mobility which is important for the regional economic development. The N4 highway is the main economic connections between the Gauteng and the North West Provinces in an east-west direction all the way to the Botswana border. The towns of Brits in MLM, Rustenburg in RLM, Swartruggerns in KRLM, and Groot Marico and Zeerust in Ramotshere Moiloa Local Municipality in the Ngaka Modiri Molema District Municipality are found along the N4 route (Bojanala, 2020). The provincial roads that links the Bojanala SEZ to the OR Tambo International and industrial hubs in Ekurhuleni are R556, R510, R104 through the Pretoria Central, and R24 from Pretoria to Ekurhuleni (see Figure 4.10).

In terms of public transport, the Bojanala District has 401 buses operating on its network, 15 bus terminal, 22 holding areas and estimated 556 bus stops (Cooperative Governance and Traditional Affairs, 2020a). There is a railway link between Tshwane-Brits-Rustenburg-Lephalale and also between Johannesburg-Koster-Zeerust–Mahikeng-Setlagole-Vryburg-Taung-Kimberley (Bojanala, 2020). There is also a small airfield in Rustenburg and an airport in the Pilanesberg park which is mainly used for

tourism. The OR Tambo International Airport is roughly 204 km from the earmarked SEZ location.

In the MKLM, the main mode of transport is by foot (68.3%), 12.3% of the residents use minibus taxis and 11.6% use bus services (Moses Kotane Local Municipality, 2022). The R510 and R556 (see Figure 4.11) are the main road linkages to the rest of the district and also to the manufacturing hubs in Ekurhuleni, roughly 240 km away by road.

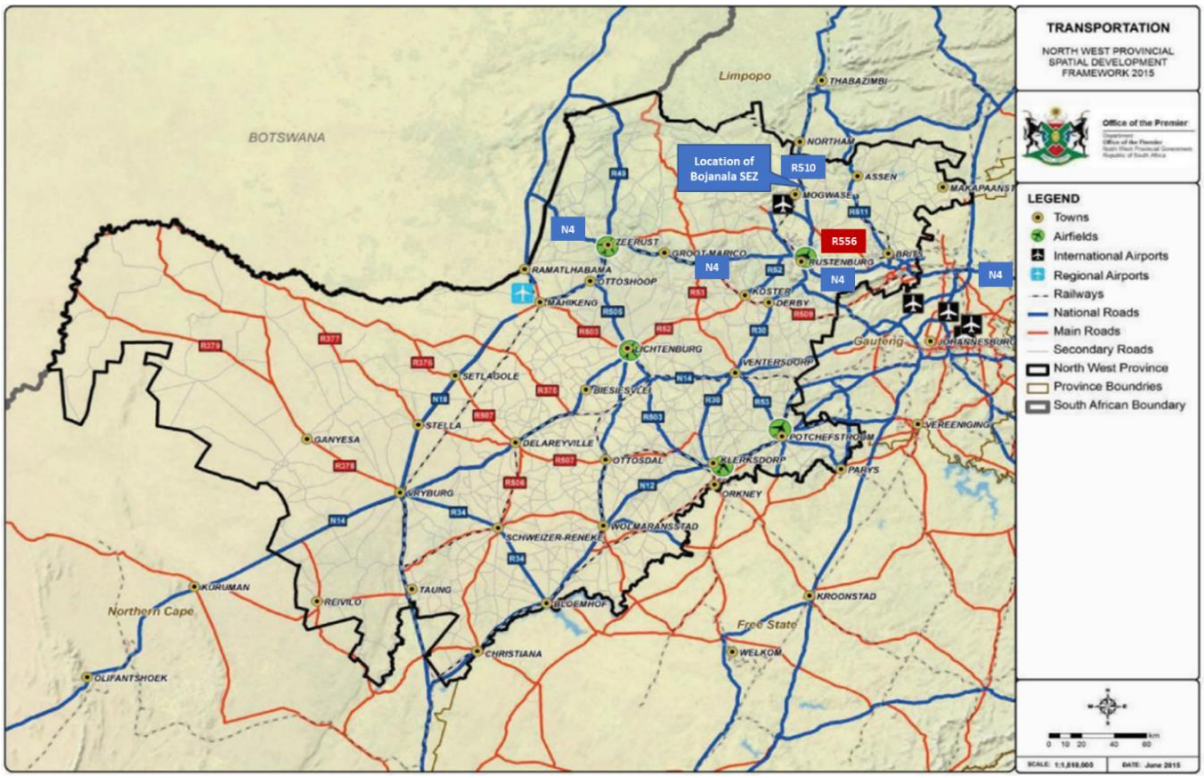


Figure 4.10: Transportation links within the Northwest Province (Bojanala, 2021)

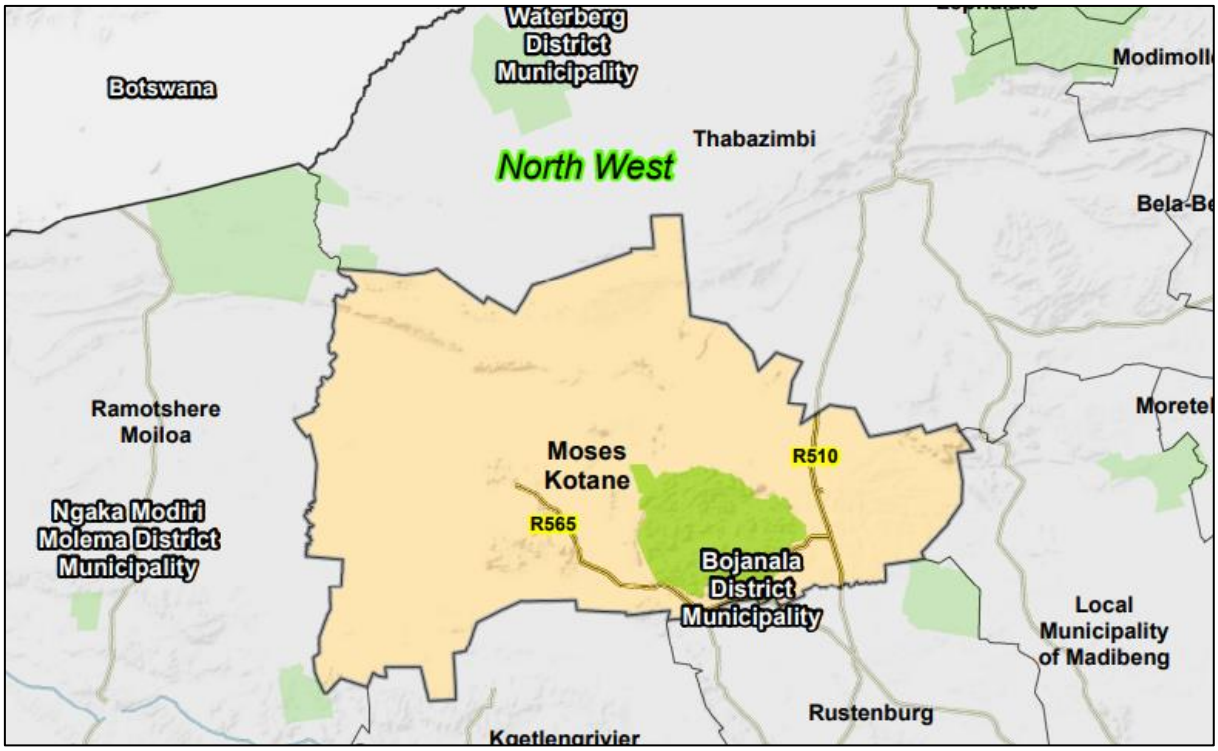


Figure 4.11: Moses Kotane Municipality Road link (Housing Development Agency, 2008)

4.3. Fetakgomo-Tubatse SEZ Case Study

This section provides a regional profile of the Fetakgomo-Tubatse SEZ. The information includes socioeconomic profile, sector analysis and spatial links within the district.

4.3.1. Socio-economic Profile

The Limpopo Province is located on the northern most part of South Africa, and it forms the border between South Africa, Zimbabwe, Botswana, and Mozambique. The Limpopo Province has an estimated land area of 125 806 km^2 and a population size of 5.8 million people (Wazimap, 2016)

There are five district municipalities (Waterberg, Capricorn, Vhembe, Sekhukhune, and Mopani) and 22 local municipalities which form part of the province. The Sekhukhune District with a land area of 13 528 km^2 is the smallest district in the province in terms of the landmass. It has a population size of 1.19 million people which represents 20% of the provincial population (Cooperative Governance and Traditional Affairs, 2020a).

The Sekhukhune district is surrounded by the Gauteng Province on the south in addition to the Waterberg, the Mpumalanga Province on the east, the Capricorn and Mopani Districts of the North West Province on the north west side (see Figure 5.12).



Figure 4.12: The location of Sekhukhune District Municipality (Cooperative Governance and Traditional Affairs, 2020b)

The Sekhukhune District is mainly rural and has a total of 764 villages shared amongst 117 wards (Cooperative Governance and Traditional Affairs, 2020b). The largest share of the population in the district are infants and children below 14 years amount to 408 000 people (34.3% of the district population). The second highest group is people between the age of 25 years and 44 years accounting for 29.3% of the district population (Cooperative Governance and Traditional Affairs, 2020b). The average age of the people in the district is 22 years and females makes up 53% of the provincial population (Sekhukhune District Municipality, 2022).

The Sekhukhune district has four local municipalities, namely Fetakgomo-Tubatse Local Municipality (FTLM), Makhuduthamaga Local Municipality (MtLM), Elias Motsoaledi Local Municipality (EMLM), Ephraim Mogale Local Municipality (EMLM2) and shown in Figure 4.13. The FTLM is the largest local municipality in the district and it accounts for 43% of the land area (Cooperative governance and traditional affairs, 2022). It is situated east of N1 highway to Polokwane and north of the N4 highway to Mbombela and (Sekhukhune District Municipality, 2022). The FTLM is the most populous of local municipalities with a population of 498 000 which is 41.9% of the district population (Community Survey, 2016, in Sekhukhune District Municipality, 2022: p. 53).

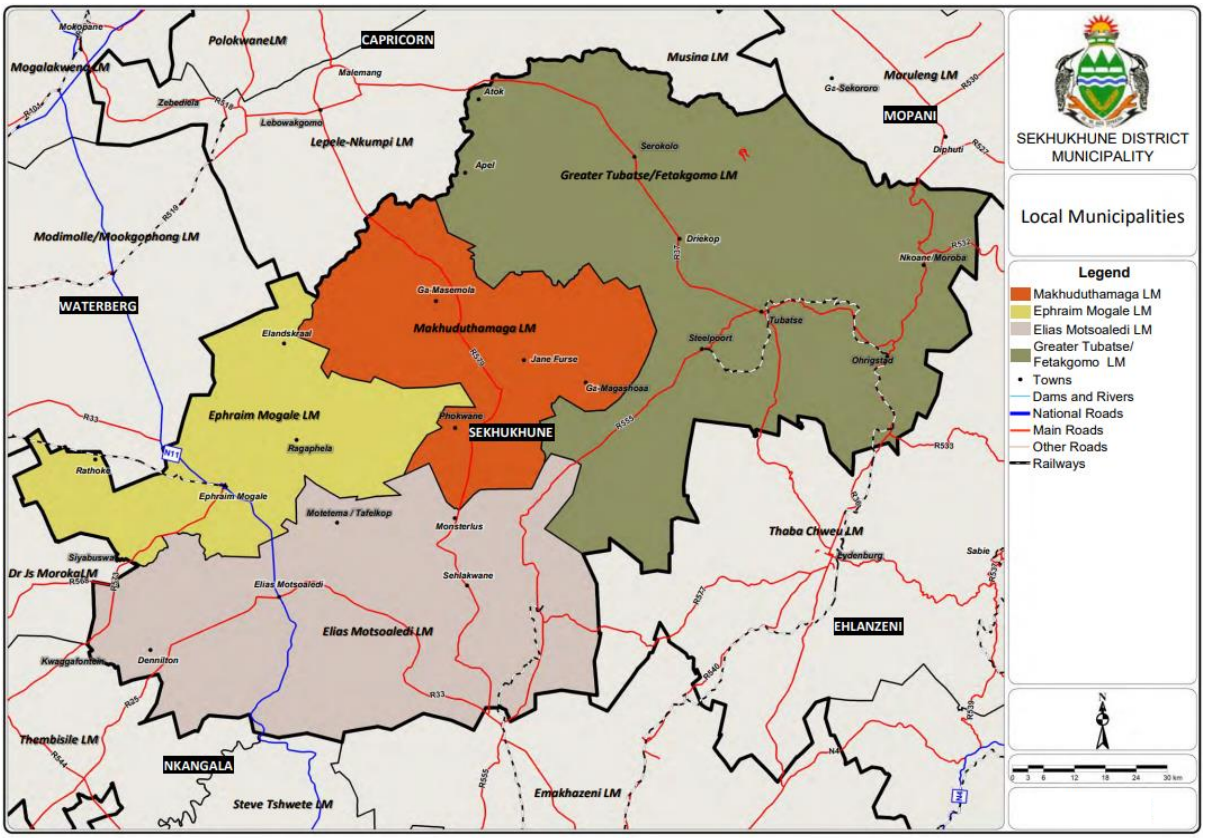


Figure 4.13: Five local municipalities of Sekhukhune District Municipality (Sekhukhune District, 2018)

The main towns in the FTLM include Burgersfort, Steelpoort, Ohrigstad and prominent settlements are Atok and Apel (Sekhukhune District Municipality, 2022). The municipality is a hive of mining activities mostly located along the Dilokong corridor (along the R37 and R55 provincial roads). The type of minerals found in the area

include chrome, platinum, magnetite, andalusite, vanadium and silica. The FTLM profile is relevant for this report because it has been earmarked as the location of the Fetakgomo-Tubatse SEZ.

The Limpopo Province had a 32.5% unemployment rate compared to the national rate of 34.9% in 2021 as shown in Figure 4.4 and the expanded unemployment was one of the highest in the country at 54.5% compared to the country's average expanded rate of 46.6% (Statistics South Africa, 2021).

In 2019, only 147 666 people or 12.4% of the Sekhukhune District residents had matric qualification and 3856 people or 0.32% had post matric qualification (certificate/diploma/bachelor's degree) (Sekhukhune District Municipality, 2022). In 2016, out of the 489 902 FTLM population, only 30% or 146 971 individuals were noted to have completed matric or matric equivalent and 4% or 19 596 was noted to have post matric (Wazimap, 2016).

4.3.2. Sector Analysis

The major industries in the Limpopo Province are mining, government, trade, and finance. Figure 5.5 shows that the Limpopo Province contributed 7% towards the South African GDP in 2019 and it was the sixth important province in that regard.

The main economic sectors in FTLM are mining and quarrying, agriculture, tourism, trade, general government, manufacturing, community, catering and accommodation and social and personal services (Statistics South Africa, 2019). The mining and agricultural sectors were the biggest employers in the FTLM in 2018 and the municipality was the biggest contributor to the provincial GDP with 49% contribution (see Figure 4.14). The mining sectors share of the GDP contribution was 48.58%.

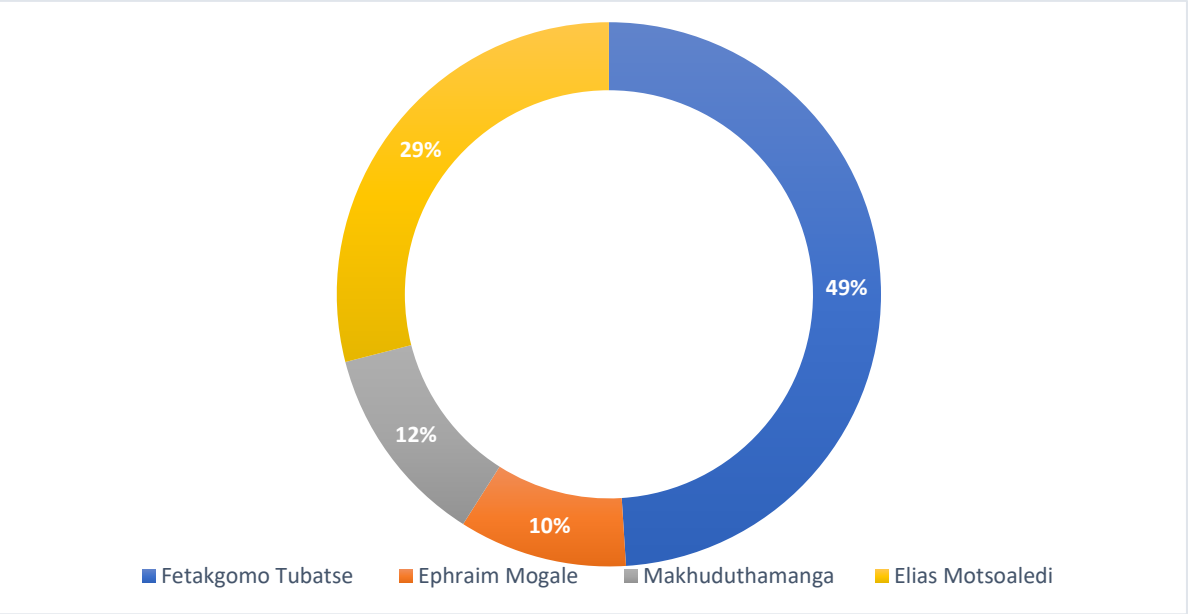


Figure 4.14: The GDP contribution of municipalities in the Sekhukhune District in 2018 (IHS Markit Regional Explorer, 2018, in Sekhukhune District, 2022)

The Sekhukhune District has a wide array of minerals that are currently being mine as shown in Figure 4.15. Municipalities with the highest mining output in the Sekhukhune district are FTLM with PGMs and chrome and EMLM with limestone and dolomite. To date the district has 27 operational mines, 7 pending mining licence applications (two each for chrome and PGMs and one each for dimensions stones, aggregate, and calcite and dolomite limestone) and 18 non-operational mines (due to water unavailability, offtake agreements and commodity demand issues) (Sekhukhune District Municipality, 2022).

Several different kinds of minerals are mined in the district including chrome, PGMs, dolomite, vanadium, andalusite, dimension stone, aggregate stone, slate, cobalt, sand, nickel, clay, copper, molybdenum, titanium, magnesite, and magnetite. The highest concentration of mining activities is in the FTLM (DMR, 2019 cited in Sekhukhune District Municipality, 2022).

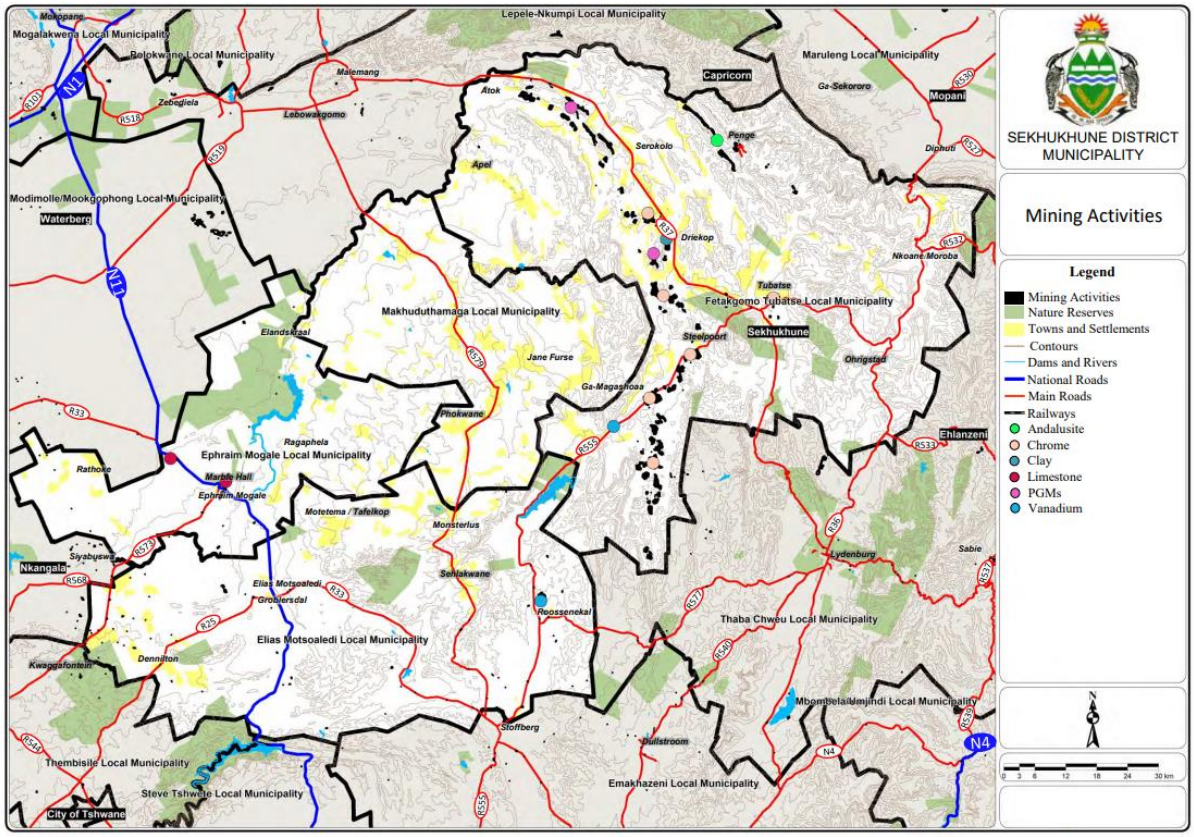


Figure 4.15: Distribution of mining activities in the Sekhukhune District (Sekhukhune District, 2022)

The SEZ is situated within the south side of the Eastern Limb of the BC in the vicinity of Steelport. In terms of PGM smelting refinery facilities, the Eastern Limb does not have its own standalone facility, it uses the facilities in the Northern Limb (Capricorn District) and Western Limb (Bojanala District) of the BC as shown in the pathway arrows in Figure 4.9.

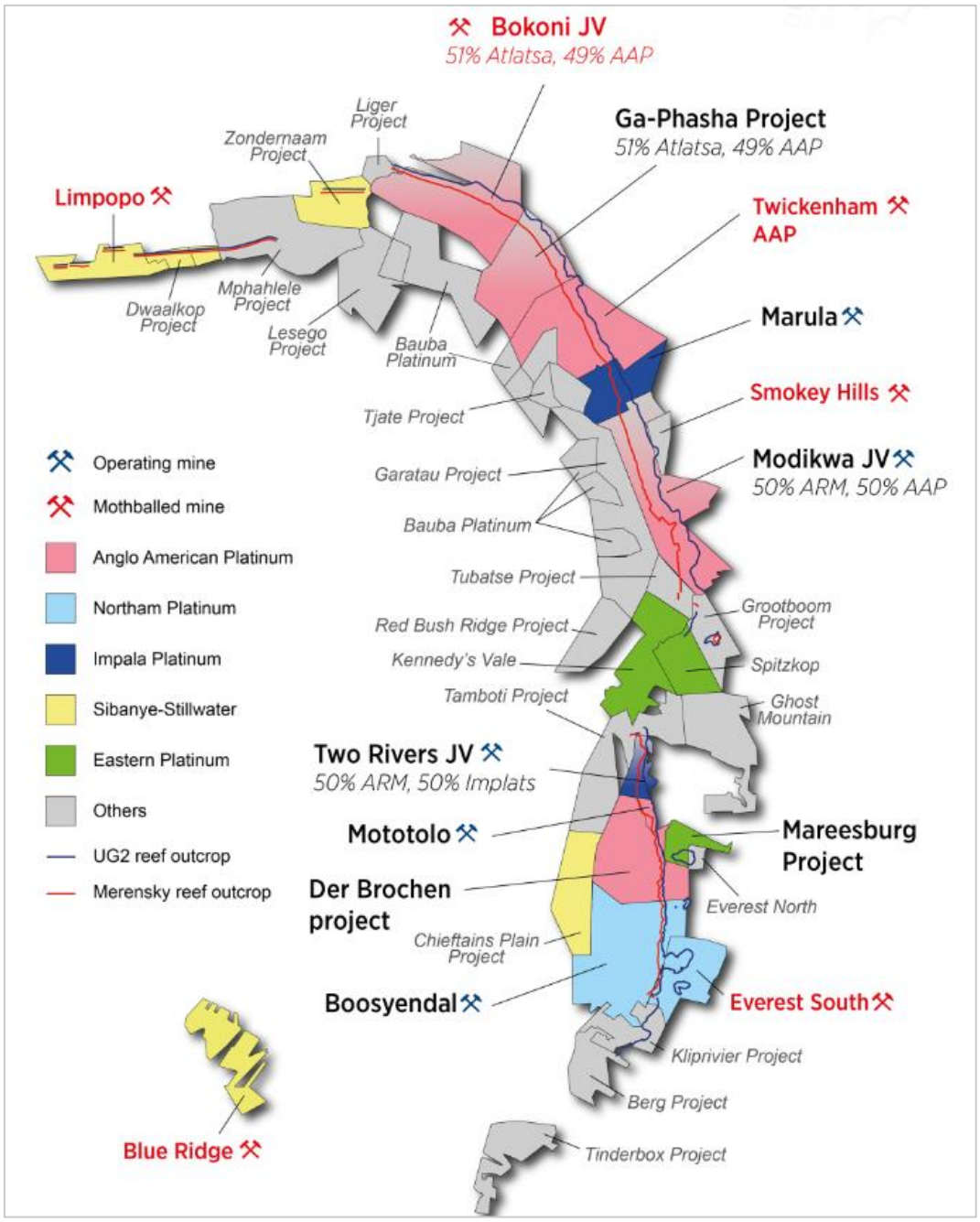


Figure 4.16: PGM mining companies located in the Eastern Limb of the BC (Oxford SFA, n.d.a)

The sectors that have been identified for the SEZ in the region include PGM beneficiation (catalysts, electrical and electronics, biomedical and pharmaceutical products, high performance alloys, fuel cells and jewellery), mining input suppliers, renewable energy components, and logistics. To date the following opportunities and source of funding have been explored as shown in Table 4.2.

Table 4.2: Opportunities identified for the Fetakgomo-Tubatse SEZ

Sector	Company	Description	Projected no of jobs	Investment value (R)
Manufacturing	NB Investments	PV modules, Manufacturing Plan	To be confirmed	R100 million
	MGB Technologies	Roof bolts	800	R80 million
	Afrique Rubber Inc.	Off-road tyres	To be confirmed	R8 million
	Linkages	Pipes	100	R121 million
	Mohlalefi Eng	Road safety systems	200	R100 million
	Compac Technologies	Fertiliser	800	R8 billion
	Barui Investment Petrochemical	Manufacturing of petroleum products	3000	R380 million
Assembly	BE-Lite Technologies	Hydrogen fuel cell dozer	200	R200 million
Green Energy	Desco Green Energy	Green energy, torrefaction, & timber processing	300	R300 million
Energy and Manufacturing	Limoflow Energy	Solar panels/energy	300	R2.2 billion
Chemicals	E 85 Solutions Pty ltd	Ethanol and sugar	1094	R955 million
	GB GEM	Lubricants and oil blending	64	R66 million
Agro-processing	AfricCapacity Group	Aquaponic	250	R200 million

(Source: DTI, 2018, in Cooperative Governance and Traditional Affairs 2020: p. 39)

4.3.3. Spatial Linkages

Access to the Sekhukhune District is mainly through three roads running through the district in the north-south (N1 and R579), south-eastern (R555) and north-western (R37) directions. These routes are the main logistics and freight corridors in the district connecting to other economic regions such as Polokwane, Mokopane, Mokgopong in the Limpopo Province and, Middleburg and Lydenburg in the Mpumalanga Province. The Dilokong Corridor (R37-R555) houses the largest number of operational mines in the district; a total of 17 operational mines are located in this corridor (see Figures 4.15 and 4.17).

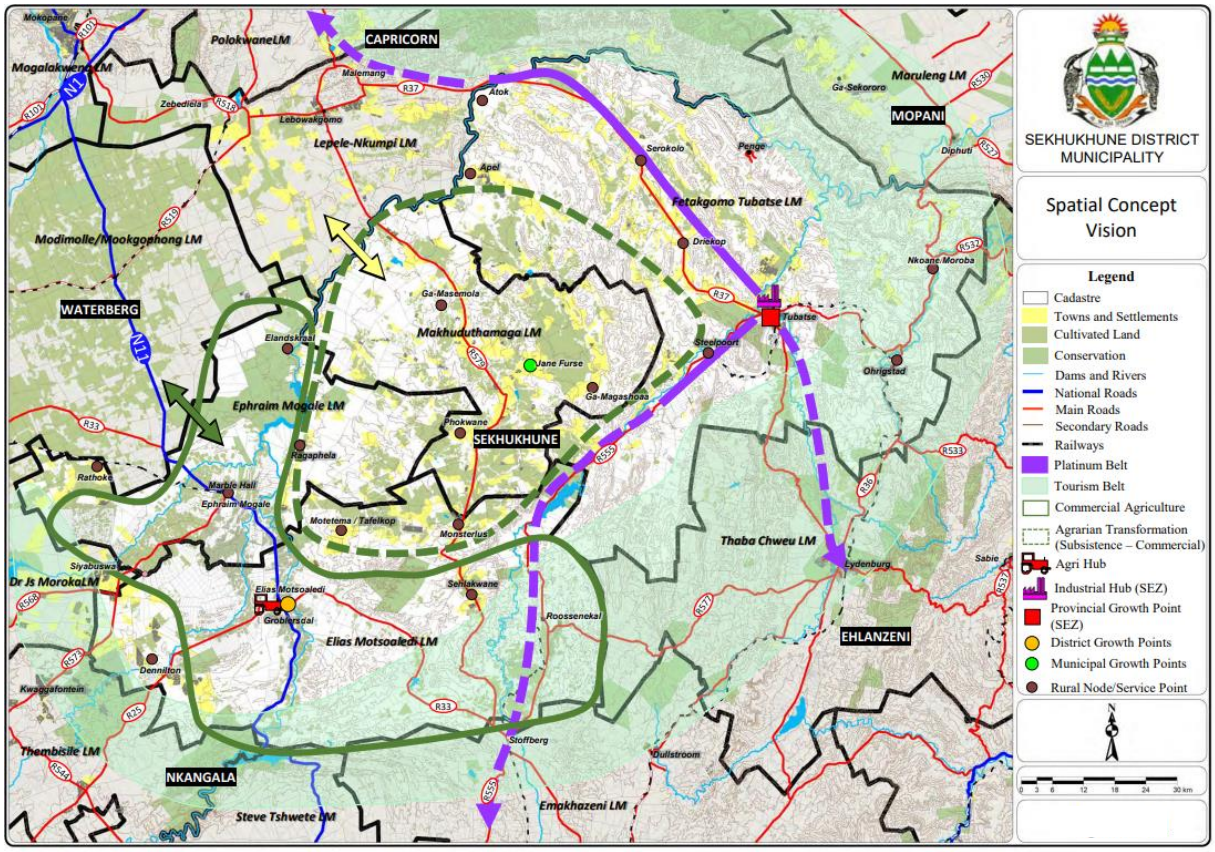


Figure 4.17: Spatial framework for the Sekhukhune District showing major routes and economic nodes (Sekhukhune District, 2018)

There are two main railways lines in the district, namely the Ohrigstad-Burgesfort-Steelport line which enters the district from the east and the Marble Hall-Nutfield line running from east to west. Commuter railway line is being considered between the south west parts of the Sekhukhune District along the Moloto Road and Pretoria (Sekhukhune District, 2018). Bus networks in the district link the towns of Jane Furse, Dennilton, Groblersdal, Siyabuswa, Phokwane, Moletema, Monsterlus, Tafelkop, and Marble Hall.

The nearest airport from the proposed SEZ location is the Polokwane International Airport located170 km away and the Mbombela International Airport (Kruger Mpumalanga International Airport) 180 km away by road travel. The Mbobela International Airport is mostly used for tourism and the Polokwane International Airport has daily travel to major routes in and outside South Africa. The proposed Fetakgomo-Tubatse SEZ is approximately 301 km from the OR Tambo International Airport and

240 km from the main manufacturing hubs of Ekurhuleni Metropolitan in the Gauteng Province.

Taxis are also used in the district by commuters to connect to the Stoffberg-Burgersfort (R555), the Burgersfort-Lydenburg (R37), and the Belfast-Lydenburg-Ohrigstad (R36-N4) main corridors. In the FTLM, the main taxi routes are:

- R25 between Groblersdal and Dennilton;
- R579 towards Jane Furse in the central parts of Makhuduthamaga;
- R579 from Jane Furse to Stoffberg;
- N11 between Groblersdal and Middelburg;
- R573 past Siyabuswa (Moloto Road);

4.4. Chapter Summary

The Bojanala SEZ, located in the MKLM, and Fetakgomo-Tubatse SEZ, located in the FTLM, have been identified as key priorities by the DTIC from 2021 and will be receiving additional assistance from the DTIC and the SEZ Programme Management Unit. The MKLM is predominantly rural comprising of several villages and two main services towns being Ledig and Moruleng and three other small service towns. The FTLM is rural in nature with the villages scattered throughout the local municipality and with only five main towns to service them. The MKLM's population with matric exit qualification stands at 11.9% of the population and only 0.9% of the residents have obtained post school qualifications. In 2016, only 4% of the population has been noted to have post matric qualification in FTLM.

The main economic sectors in FTLM and MLKM are mining and agriculture. The sectors that have been identified for the Bojanala SEZ include PGM beneficiation (catalysts, electrical and electronics, biomedical and pharmaceutical products, high performance alloys, fuel cells, and jewellery manufacturing), mining input supplier park, renewable energy components manufacturing, and logistics. The renewable energy, capital equipment manufacturing, beneficiation of other minerals, and agro-processing opportunities have been explored (including funding requirements thereof).

The sectors that have been identified for the Fetakgomo-Tubatse SEZ include PGM beneficiation (catalysts, electrical and electronics, biomedical and pharmaceutical products, high performance alloys, and fuel cells and jewellery manufacturing), mining input supplier park, renewable energy components manufacturing, and logistics. The opportunities for green energy generation, timber processing manufacturing, assembling, agro-processing, chemicals manufacturing, and beneficiation of other minerals have been explored as well, including the required funding.

Access to the MKLM is through two main roads that are linked to three main routes that runs through the Bojanala District. In terms of air travel, the district has a small airfield in Rustenburg and an airport in the Pilanesberg park which is mainly used for tourism. The main mode of transport in the MKLM is by foot and followed by taxis/buses. A railway line exists that connects to other towns in the district. Access to the FTLM is mainly through three main roads running through the Sekhukhune District, two main railway lines and taxis. There are two small international commercial airports within 200 km from the earmarked SEZ location. The analysis of the viability of Bojanala and Fetakgomo-Tubatse SEZs is discussed in the next chapter.

5. DATA ANALYSIS AND DISCUSSION

5.1. Introduction

The purpose of this research was to explore if a PGM SEZ can be developed successfully in the BC in order to be used as an instrument to increase the mining industry's contribution to the South African economic development. This study sought to explore the questions of whether the current SEZ model is adequate to enable its success in the BC and whether the current regional socio-economic profile, education level, spatial linkages, and sector analysis are sufficient to enable the success of the PGM SEZ in the BC. To this effect, a viability matrix was developed.

5.2. Proposed Viability Matrix

It is presumed that the current South African SEZ model is adequate given the corrective actions that the DTIC has put in place for the SEZs that will be developed between 2020 and 2030. In terms of the literature there is a sound legal, regulatory framework aligned to long-term government strategy. The four criteria for the viability matrix were chosen because they are the key success factors after regulatory framework and legal compliance, and ahead of financial valuation. These criteria will include several descriptors that will be used to assess both Bojanala and Fetakgomo-Tubatse SEZs. These are:

- *Spatial linkages*: This pertains to the ease of access in and out of the SEZ through rail, road, and air transportation. This factor is aligned to the literature in terms of SEZ being more successful if they are co-location in major transport area.
- *Sector Analysis*: South Africa has a comparative advantage in terms of PGMs and the majority of PGM operations are located in the Eastern Limb And Western Limb of the BC. This is aligned with the literature that that SEZs programs must be built on local strengths and should depend on the local comparative and competitive advantage;

- *Education level*: This criterion looks at the proportion of the locals with matric or matric equivalent and post matric qualifications. This factor is aligned with the literature in terms of SEZ being more successful if there is available skills, access to training, technology transfer and implementation (the implication being firms within the SEZ can only be successful if they have access to skilled and knowledgeable employees); and
- *Value proposition*: This criterion looks at what is being proposed to be offered within the SEZ. This is aligned with literature in that SEZs can succeed if they incorporate local supplies into their value chains.

A viability matrix in Table 5.1 has been developed to determine the viability of the Bojanala and Fetakgomo-Tubatse SEZs. The proposed viability matrix provides a quantitative view of the two SEZs based on multiple considerations articulated in Chapter 4. The viability matrix ranking methodology is based on:

- Four criteria with 12 descriptors;
- Score indicator per descriptor; and
- The weight factor (percentage total for all criteria), which based on the relative importance of the descriptor.

Table 5.1: The proposed viability matrix for SEZ

Criteria	Descriptor	Score Indicator	Weight Factor (%)
Value proposition	Complementarity of offerings within the SEZ	1: Bad 2: Poor 3: Acceptable 4: Good 5: Excellent	15
	Niche market focus based on services and products	1: Not defined 2: Poorly defined 3: Defined	5
	SEZ tailored for domestic market	0: No 5: Yes	5
	SEZ tailored for export market	0: No 5: Yes	5
Education Level	Percentage of local municipality population with grade 12 or equivalent qualifications	1: 0 to 5% 2: > 5% to 10% 3: >10% to 15%	17.5

Criteria	Descriptor	Score Indicator	Weight Factor (%)
		4: > 15% to 20% 5: > 20%	
	Percentage of local municipality with post grade 12 or equivalent qualifications	1: 0 to 2.5% 2: > 2.5% to 5% 3: >5% to 7.5% 4: > 7.5% to 10% 5: > 10%	17.5
Spatial Linkages	Distance to train station (ease of access to SEZ)	3: 0 to 50 km 2: > 50 to 100 km 1: > 100 km	5
	Distance to port (SEZ to Durban port)	3: 0 to 400 km 2: > 400 to 800 km 1: > 800 km	5
	Distance to cargo airport (SEZ to ORT)	3: 0 to 200 km 2: > 200 to 500 km 1: > 500 km	5
Sector Analysis	Number of PGM mines in that part of the district	0: 0 mines 1: 1 - 2 mines 2: 3 - 4 mines 3: 5 - 6 mines 4: 7 - 8 mines 5: = or > 9 mines	10
	Number of mines (including PGM mines) in the district	0: 0 mines 1: 1 - 5 mines 2: 5 - 10 mines 3: 11 - 15 mines 4: 16 - 20 mines 5: = or > 21 mines	5
	Number of PGM smelters and refineries in the district	0: 0 facilities 1: 1 - 2 facilities 2: 3 - 4 facilities 3: 5 - 6 facilities 4: 7 - 8 facilities 5: = or > 9 facilities	5

According to the proposed viability matrix in Table 5.1, a rating greater than 4.41 would indicate a very high viable potential of a SEZ succeeding while a rating less than 1.36 would indicate a very low viable potential of a SEZ succeeding. Table 5.2 shows a rating range of the viable matrix.

Table 5.2: The proposed viability matrix range for SEZ

Rate	< or = 4.14	4.13 – 3.22	3.21 – 2.29	2.28 - 1.37	1.36 = or >
Description	Very High Viable Potential	High Viable Potential	Medium Viable Potential	Low Viable Potential	Very Low Viable Potential

5.3. Bojanala Platinum SEZ Analysis

The viability of the Bojanala SEZ was assessed against the four proposed viability matrix criteria, namely, value proposition, education level, sector analysis, and spatial linkages. Table 5.3 show the results of the viability matrix with respect to Bojanala SEZ.

Table 5.3: The viability matrix results for Bojanala SEZ

Criteria	Descriptor	Score	Weight Factor	Weighted Score
Value proposition	Complementarity of offerings within the SEZ	5	0.15	0.6
	Niche market focus based on products and services	2	0.05	0.1
	SEZ tailored for domestic market	5	0.05	0.25
	SEZ tailored for export market	5	0.05	0.25
Education Level	Percentage of local municipality population with grade 12 or equivalent qualifications	3	0.175	0.525
	Percentage of local municipality with post grade 12 or equivalent qualifications	1	0.175	0.175
Spatial Linkages	Distance to train station (ease of access to SEZ)	2	0.05	0.1
	Distance to port (SEZ to Durban port)	2	0.05	0.1
	Distance to cargo airport (SEZ to ORT)	2	0.05	0.1
Sector Analysis	Number of PGM mines in that part of the district	5	0.1	0.5
	Number of mines (including PGM mines) in the district	5	0.05	0.25
	Number of PGM smelters and refineries in the district	5	0.05	0.15
Total		**42**		**3.2**

5.3.1. Bojanala SEZ Value Proposition Assessment

The sectors that have been identified for the SEZ include PGM beneficiation (catalysts, electrical and electronics, biomedical and pharmaceutical products, high performance alloys, fuel cells, and jewellery), mining input suppliers, renewable energy components, and logistics. The sectors identified will produce several products that feed into each other and also drive demand for the individual products specifically in the PGM beneficiation which can be used as input into mining suppliers and renewable energy components. The logistic industry will assist in storing and transporting goods produced in the SEZ. Based on this information the offerings in the SEZ were seen to be good and a score of 5 was given.

PGM beneficiation, mining input suppliers, renewable energy components, and logistics are not unique sectors to Bojanala district or even in South Africa. Several other countries are engaged in similar activities. However, given the comparative advantage of the PGM mineral endowment, the Bojanala SEZ could carve a niche by focusing on PGM beneficiation since the mines, concentrators, smelters are all uniquely situated in the area. Given this information, the Bojanala SEZ still has to spend some time deciding on what is its niche offering and what will be its cost advantage over already existing competitors in this sector. Since niche markets, and products and services focus still have to be adequately defined, a score of 2 was given.

Notwithstanding what has been said about niche markets and products and services focus, there is a fair indication from the South African SEZ model and Table 5.1 that the Bojanala SEZ is geared for both domestic and export markets. It is nonetheless noted from the literature that SEZs in the world are tailored mostly for the export market. In the case of the Bojanala SEZ, scores of 5 for both domestic market and export markets was given. Overall, the value proposition assessment for Bojanala has a total score of 16 out of 18 with a weighted score of 1.2.

5.3.2. Bojanala SEZ Education Level Assessment

The Moses Kotane Local Municipality is the host of the SEZ and in 2016 only 11.9% of the population was noted to have completed matric or had matric equivalent. In

terms of the proposed viability matrix, this would give a score of 3 (> 10% to 15%) for the percentage of local municipality with matric. In terms of post matric qualifications or equivalent only 0.9% of the population have obtained post school qualification. In terms of the proposed viability matrix the percentage of district municipality with post grade 12 or equivalent qualifications would have a score of 1 (0 to 2.5%). Overall, the SEZ education level assessment for Bojanala gives a score of 4 out of 10 and a weighted score of 0.7.

5.3.3. Bojanala SEZ Spatial Linkages Assessment

The SEZ spatial links assessment looks at the ease of access in and out of the SEZ through rail, road, and air transportation. The nearest railway close to the SEZ is a train station 50.4 km away in Rustenburg. In terms of proposed viability matrix this would attain a score of 2. The distance from Bojanala to OR Tambo airport is 204 km, a score of 2 (> 200 to 500 km) was given, whereas the distance from SEZ to Durban port is 736 km and a score of 2 (> 400 to 800 km) was given. The overall the SEZ spatial linkages assessment has a score of 6 out of 9 and a weighted score of 0.3.

5.3.4. Bojanala SEZ Sector Analysis Assessment

The SEZ sector analysis assessment looks at the presence of a thriving primary mining and processing sector in the area. Bojanala SEZ which is in the Western Limb of the BC with 55 mining companies of which 11 of them are engaged in PGM production. Furthermore, there are nine smelters and refineries in the Bojanala district which are owned by several different companies. That is, five facilities are smelting operations, three are base metal refineries, one is a precious metals refinery. In this regard, a score of 5 (= or > 9 mines) for PGM mines was given, a score of 5 (= or > 21 mines) for mines in general was given, and a score 5 was given for smelting and refinery facilities (= or > 9 facilities). Overall, the SEZ sector analysis assessment was given a score of 15 out of 15 and a weighted score of 1.

5.4. Fetakgomo-Tubatse SEZ Analysis

The viability of the Fetakgomo-Tubatse SEZ was assessed against the four viability matrix criteria, namely, value proposition, education level, spatial linkages, and sector analysis. Table 6.4 show the viability matrix results with respect to Fetakgomo-Tubatse SEZ.

Table 5.4: Viability Matrix for Fetakgomo-Tubatse SEZ

Criteria	Descriptor	Score	Weight Factor	Weighted Score
Value proposition	Complementarity of offerings within the SEZ	5	0.15	0.6
	Niche market focus based on products and services	2	0.05	0.1
	SEZ tailored for domestic market	5	0.05	0.25
	SEZ tailored for export market	5	0.05	0.25
Education Level	Percentage of local municipality population with grade 12 and equivalent qualifications	5	0.175	0.875
	Percentage of local municipality with post grade 12 and equivalent qualifications	2	0.175	0.35
Spatial Linkages	Distance to train station (ease of access to SEZ)	3	0.05	0.15
	Distance to port (SEZ to Durban port)	2	0.05	0.1
	Distance to cargo airport (SEZ to ORT)	2	0.05	0.1
Sector Analysis	Number of PGM mines in that part of the district	5	0.1	0.5
	Number of mines (including PGM mines) in the district	5	0.05	0.25
	Number of PGM smelters and refineries in the district	0	0.05	0.0
Total		**41**		**3.53**

5.4.1. Fetakgomo-Tubatse SEZ Value Proposition Assessment

The sectors that have been identified for the SEZ includes PGM beneficiation (catalysts, electrical and electronics, biomedical and pharmaceutical products, high performance alloys, fuel cells, and jewellery), mining input suppliers, renewable energy components, and logistics. The sectors identified will produce several products that feed into each other and also drive demand for the individual products specifically in the PGM beneficiation which can be used as input into mining suppliers and renewable energy components. The logistic industry will assist in storing and transporting goods

produced in the SEZ. Based on the information of the offerings in the SEZ, a score of 5 was given.

PGM beneficiation, mining input suppliers, renewable energy components, and logistics are not unique sectors to the Sekhukhune District or even South Africa. Several countries in western Europe, USA and Scandinavia are engaged in similar activities (Lydall, 2009). However, given the comparative advantage of the PGMs mineral endowment, the SEZ could carve a niche by focusing on PGM beneficiation since there are mines in the area. Given this information the Fetakgomo-Tubatse SEZ still has to spend some time deciding on what is its niche offering and what will be it cost advantage over already existing competitors in this sector. Since the niche market focus for products and services still has to be adequately defined, a score of 2 was given.

Similar to the Bojanala SEZ, and notwithstanding what has been said above about niche markets and products and services focus, there is a fair indication from the South African SEZ model and Table 5.2 that the Fetakgomo-Tubatse SEZ is geared for both export and domestic markets particularly in SADC countries like Zimbabwe, Zambia, Mozambique, and Swaziland. In the case of the Fetakgomo-Tubatse SEZ, scores of 5 for both domestic market and export markets was given. Overall, the level of the value proposition for Fetakgomo-Tubatse has a score of 16 out of 18 and a weighted score of 1.2.

5.4.2. Fetakgomo-Tubatse SEZ Education Level Assessment

The Fetakgomo-Tubatse local municipality is the host of the SEZ and in 2016, 30% of the population was noted to have completed matric or had matric equivalent qualifications and because of this, a score of 5 (> 20% of local municipality population with matric). In terms of the post matric qualifications or equivalent only 4% of the population have obtained post school qualification and in this case a score of 2 was given (> 2.5% to 5%). Overall, the level of education assessment for the Fetakgomo-Tubatse SEZ had a weighted score of 1.225 and a score of 7 out of 10.

5.4.3. Fetakgomo-Tubatse SEZ Spatial Linkages Assessment

The spatial links assessment looks at the ease of access in and out of the SEZ through rail, road, and air transportation. The nearest railway line to the planned Fetakgomo-Tubatse SEZ location is near the town of Steelpoort, where the SEZ will be located. In this case, a score of 3 was given. The distance from Steelport (Fetakgomo-Tubatse) to OR Tambo airport is approximately 295 km, resulting in a score of 2 (> 200 to 500 km). The distance from Steelport to the Durban port is 745 km, resulting in a score of 2 (> 400 km to 800 km). The overall spatial linkages assessment is 7 out of 9 and a weighted score of 0.35.

5.4.4. Fetakgomo-Tubatse SEZ Sector Analysis Assessment

The sector analysis assessment looks at the presence of a thriving primary mining and processing sector in the area. The Sekhukhune district where Fetakgomo-Tubatse SEZ is located has 27 operational mines and 18 non-operational mines. Furthermore 8 out of the 27 operational mines are engaged in PGM production. The district does not have standalone PGM smelters and refineries, concentrate from the mines is sent to the facilities in the Northern Limb and Western Limb of the BC as shown in the pathway arrows in Figure 4.9. Given this information, a score of 5 (= or > 9 mines) was given for the number of PGM mines the district and a score of a score of 5 (= or > 21 mines) for number of mines in the district. Given that there are no PGM smelting and refinery facilities in the district a score of 0 (0 facilities) was given for the number of PGM Smelting and Refinery facilities in the district. Overall, the SEZ sector analysis assessment has a score of 10 out of 15 and a weighted score of 0.75.

5.5. Discussion

The results of the proposed viability matrix in Table 6.2 indicate that the value proposition for both SEZs is equally matched. In terms of education level assessment, Fetakgomo-Tubatse SEZ has better matric and post matrix qualification levels with an overall weighted score of 1.225 against 0.7 for Bojanala SEZ. This is an important factor because it means that the SEZ in Fetakgomo-Tubatse has bigger pool of

educated and skilled people for its industries. However, this is probably still not adequate if the complexity of the complementarity and the required competitive levels are considered. For example, the mining equipment, technology, and services (METS) sector in Australia, which employed over 90 000 people in 2009, is largely successful and globally competitive because in 2009 approximately 83% of employees had post-grade 12 or equivalent qualifications, and 17% did not have formal qualification (Leeuw, 2021).

Based on these statistics, there were approximately 74 700 people with post-grade 12 or equivalent qualifications back in 2009 working in the Australian METS sector, whereas there were only 2427 people in 2022 in the MKLM and 19 920 people in 2016 in FTLM with post-grade 12 and equivalent qualifications. This Australian accumulated knowledge, among others, is the one that the Bojanala and Fetakgomo-Tubatse SEZs must compete with.

In terms of the spatial linkages, the data suggests that Fetakgomo-Tubatse has a better rail transport because it has a railway line that runs directly through the town of Steelport which is the location of the SEZ as opposed to the Bojanala SEZ in Mogwase which is located 50 km away from the nearest railway line in Rustenburg. In terms of road links to key ports, the data indicates that Bojanala SEZ is better positioned because it is closer to the OR Tambo International Airport, whereas both SEZs are relatively the same distance from the Durban Port. Furthermore, based on the road and rail density, the Bojanala SEZ is likely to have better access to markets (inputs and outputs) than Fetakgomo-Tubatse SEZ.

Lastly in terms of the sector analysis, there are more PGM mines and other mines in general, and facilities such as smelters and refineries in the Bojanala District compared to the Sekhukhune District. The Bojanala SEZ also scored better in terms of the smelters and refinery facilities since it has nine beneficiation facilities within Bojanala District whilst Sekhukhune District, where Fetakgomo-Tubatse is located, does not have its own standalone PGM beneficiation facilities (smelters or refineries) rather it uses facilities in the Northern Limb (Capricorn District) and Western Limb (Bojanala District) of the BC.

In terms of the overall scoring on the viability matrix looking at all four criteria, the Fetakgomo-Tubatse SEZ has an overall total score of 3.53 while the Bojanala SEZ has an overall total score of 3.2. From this, based on Table 5.2, it can be concluded that the Fetakgomo-Tubatse SEZ has a high viable potential to succeed while the Bojanala SEZ has a medium viable potential to succeed.

5.6. Chapter Summary

A thematic analysis was undertaken to analyse the data collected in this research. This thematic analysis was done in the form of a viability matrix which would provide a quantitative view of the two SEZs based on multiple themes or criteria such as SEZ value proposition, education level, spatial linkages, and sector analysis. The data collected was grouped into these themes and from that a determination could be made of which SEZ performs better in that respect.

The value proposition assessment looked at the complementary of offerings within the SEZ, niche market focus of the products and services, SEZ tailored for domestic market and SEZ tailored for the export market. The education level assessment looked at the percentage of local municipality population with grade 12 and equivalent qualifications and percentage of local municipality population with post grade 12 or equivalent qualifications. The spatial linkages assessment looked at the distance to rail station (ease of access to SEZ), the distance to port (SEZ to Durban port) and the distance to cargo airport (SEZ to ORT). Lastly the sector analysis looked at the number of PGM mining companies in that part of the BC (Western Limb or Eastern Limb), the number of mining companies in the district and the number of PGM smelters and refineries in the BC (Western Limb or Eastern Limb).

In terms of scoring, the value proposition for both SEZs are equally matched. For the education level assessment, Fetakgomo-Tubatse SEZ scored higher. Bojanala SEZ scored higher on the spatial linkages and has a higher score in terms of the sector analysis. While there is likelihood that both SEZs could succeed, the Fetakgomo-Tubatse SEZ is a marginally better choice than the Bojanala SEZ.

6. Conclusion and Recommendations

6.1. Conclusion

South Africa is richly endowered with over 80% of the known global PGM deposits in the BC and there is an opportunity to turn this endowment into a competitive advantage. An opportunity exists to establish several secondary and tertiary economic activities involving PGM in the form of business clusters in the Eastern Limb and Western Limb of the BC. This would be leveraging on the existing PGM mines, concentrators, smelters, and refineries belonging to the four major global PGM producers that all uniquely situated in the BC.

This study was aimed to explore if a PGM SEZ can be developed successfully in the BC and be used as an instrument to increase the mining industry's contribution to the South African economic development. As part of the study, a detailed overview of the South African SEZ landscape, including Bojanala and Fetakgomo-Tubatse SEZs was conducted as well as development of a proposed viability matrix to assess which SEZ in the BC is likely to succeed based on the regional socio-economic profile, education level, spatial linkages, and sector analysis.

A detailed literature review was conducted which looked into economic development theories and South African development policies. The economic development theories mentioned in this report demonstrate that there is no universally accepted theory of development, instead there are continually developing strands of thought on how to achieve and sustain economic growth. This means that development efforts need to be based on the assessment of each individual country's situation and also requires sensible and skilful equalisation of market promotion and pricing in order to allow markets to operate efficiently along with well thought-out government policies. Some of these polices include industrial policies.

South Africa has had a myriad of development policies since the inception of democracy in 1994, to date the country is using the National Development Plan as its guiding document. The NIPF and its implementation plan (IPAP) are both aligned to the country social agenda highlighted in the National Development Plan 2030

document. The country's beneficiation strategy which was launched during the New Growth Path era is not a broad approach but only focuses on forward linkages of minerals into higher value products. The backward and side-stream linkages are covered in the Mining Charter through focus areas such as procurement, enterprise development, HRD and research and development. SEZs have been noted as the ideal vehicle to foster entrepreneurship environment, innovation and skills training that will eventually have spill-over effects into the rest of the economy.

An overview of SEZs globally and in South Africa was covered in Chapter 2 which noted that SEZs have been used globally since the 16th and 17th century although the first modern day SEZs started in Asia and Latin America. These modern day SEZs were and are used as instruments to promote foreign direct investments, industrialisation, and sustainable economic growth. These zones come in different forms such as hybrid export processing zones, free trade ports, export processing zones, special economic zones, and free enterprise zones. In terms of mining, there has been a few regions that have developed mining business clusters to support the industry. The two notable ones are the Sudbury Business Cluster in Canada and the Antofagasta Mining Cluster in Chile.

South Africa has implemented the SEZ programme with the hope of realising the vision espoused in its beneficiation strategy by implementing the SEZ Act No.16 of 2014 Act. To date South Africa has 11 operational SEZs, two designated but yet to start construction and 5 still undergoing the application process. The two PGM SEZs namely Bojanala SEZ and Fetakgomo-Tubatse SEZ are included in the SEZs still undergoing this progress.

The research methodology used in this research includes the research approach, research design, data sources, data analysis and research validation. The research approach for the study is an exploratory sequential mixed methodology consisting of a case study to test the relationship between variables that were determined to be important for the success of an SEZ. The case study explored the regional socio-economic profiles, education level, spatial linkages, and sector analyses of where the two PGM SEZs will be. The sources of data were research papers and reports, books, journal articles, conference papers, documents from government agencies, websites,

annual reports, news articles, web blogs and published statistics from research organisations.

The Fetakgomo-Tubatse SEZ will be hosted by the Fetakgomo-Tubatse Local Municipality (FTLM) in Sekhukhune District in the Eastern Limb of the BC. The Bojanala SEZ will be hosted by the Moses Kotane Local Municipality (MKLM) in the Bojanala District in the Western Limb of the BC. The MKLM is predominantly rural comprising of several villages and two main services towns being Ledig and Moruleng and three other small service towns. The FTLM is rural in nature with the villages scattered throughout the local municipality and with only five main towns to service them. In 2022, the MKLM's population with matric exit qualifications was 11.9% and only 0.9% have obtained post school qualifications. In 2016, only 30% of the population in the FTLM had matric exit qualifications and 4% of the population had post matric qualifications.

The main economic sectors in FTLM and MLKM are mining and agriculture. The sectors that have been identified for the Bojanala SEZ include PGM beneficiation (catalysts, electrical and electronics, biomedical and pharmaceutical products, high performance alloys, fuel cells, and jewellery manufacturing), mining input supplier park, renewable energy components manufacturing, and logistics. The renewable energy, capital equipment manufacturing, beneficiation of other minerals, and agro-processing opportunities have been explored (including funding requirements thereof).

The sectors that have been identified for the Fetakgomo-Tubatse SEZ include PGM beneficiation (catalysts, electrical and electronics, biomedical and pharmaceutical products, high performance alloys, and fuel cells and jewellery manufacturing), mining input supplier park, renewable energy components manufacturing, and logistics. The opportunities for green energy generation, timber processing manufacturing, assembling, agro-processing, chemicals manufacturing, and beneficiation of other minerals have been explored as well, including the required funding.

Access to the MKLM is through two main roads that are linked to three main routes that runs through the Bojanala District. In terms of air travel, the district has a small airfield in Rustenburg and an airport in the Pilanesberg park which is mainly used for

tourism. The main mode of transport in the MKLM is by foot and followed by taxis/buses. A railway line exists that connects to other towns in the district. Access to the FTLM is mainly through three main roads running through the Sekhukhune District, two main railway lines and taxis. There are two small international commercial airports within 200 km from the earmarked SEZ location.

The analysis in Chapter 5 articulated the proposed viability matrix that was developed to assess the two SEZ based on the themes which emerged from the case study information. Proposed viability matrix provides a quantitative view of the two SEZs based on multiple considerations articulated in Chapter 5. The ranking methodology of the viability matrix is based on 4 criteria with 12 descriptors. A score per criteria was allocated per SEZ based on the viability matrix guidelines and this was also given a weighting based on its qualitative importance. The proposed viability matrix indicates that Bojanala SEZ has a medium viable potential to succeed based on the overall total viability matrix weighted score of 3.2 whilst on the other hand Fetakgomo-Tubatse SEZ has an overall total weighted of 3.53 which means it has a high viable potential to succeed.

The research questions that were explored looked at whether the current South African SEZ model is adequate to enable the success of a SEZ in the BC and also if the current socio-economic profile, education level, spatial linkages, and sectorial dynamics are sufficient to enable the success of a PGM SEZ. The first question was looked into in Chapter 2 where policy instrument for the establishment of SEZ and the local SEZ landscape in South Africa was analysed and it was generally accepted that the current South African SEZ model is adequate to enable the success of a SEZ in the BC.

In regard to the second research question, Chapter 4 analysed the Bojanala and Fetakgomo-Tubatse SEZs in a case study format and use the proposed viability matrix to assess their viability. The results indicated that Fetakgomo-Tubatse SEZ is better positioned to be likely more successful as an SEZ because it scored higher overall in viability matrix even though it scored lower on the spatial linkages and sector analysis. This was mainly driven by the value proposition and education level assessment due to the Fetakgomo-Tubatse Local Municipality having a larger population size with

school leaving qualification or equivalent (30% of population) and post matric qualification (4% of population) which can provide the requisite labour pool for the SEZ.

The study sought to explore if a PGM SEZ can be developed successfully in the BC in the manner that they can be used as an instrument to increase the mining industry's contribution to South African economic development. The case studies indicate that both SEZ have been successful in acquiring funding from companies that want to locate in the zone and to supply domestic and foreign markets with products. This, can be argued, potentially indicates that both SEZs will be in a position to promote business clustering in their respective municipal areas with the right support from local, provincial and national spheres of the government, including access to the developed countries' markets.

The significance of the research findings is that the PGM SEZs are potentially viable economic model to invigorate economic growth subject to long-term planning and support, enabling national and regional policy regime and associated policy instruments, adequate regional education levels and spatial linkages, and niche market offering. Furthermore, a qualitative and quantitative matrix such as the proposed viability matrix in this research can be used to assess the viability of a SEZ. The implication of the viability assessment would be to lower the risk of the potential failure of a SEZ and harmonise it with its immediate environment.

6.2. Recommendations

The robustness of this study could be improved by conducting interviews with SEZ operators in South Africa, DTIC SEZ Lead, North West Development Corporation (NWDC) and Limpopo Economic Development Agency (LEDA) which are the development agencies tasked with development of the Bojalana and Fetakgomo-Tubatse SEZs. The study could also focus on group discussions and interviews with community leaders, business forums and traditional leaders in affected locations.

There could also be an opportunity to investigate potential synergy between the two SEZs discussed in this study and the proposed Hydrogen Valley Corridor that will run

from Polokwane/Mokopane to Johannesburg and Durban, which as the starting point would be located in the Northern Limb of the BC.

Lastly for these SEZs to be successful the level of education and skills in particular in the fields of science, technology, engineering and mathematics (STEM) should be increased.

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