SUSTAINING LIVELIHOODS IN POST-MINE CLOSURE CONTEXTS: APHENOMENOLOGICAL STUDY OF FORMER-MINEWORKERS AT TSHIKONDENI MINE IN LIMPOPO PROVINCE, SOUTH AFRICA

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DECLARATION

I Patrick Dzimiri, declare that the thesis **"SUSTAINING LIVELIHOODS IN POST-MINE CLOSURE CONTEXTS: A PHENOMENOLOGICAL STUDY OF FORMER-MINEWORKERS AT TSHIKONDENI MINE IN LIMPOPO PROVINCE, SOUTH AFRICA**" hereby submitted for the **MASTER'S DEGREE QUALIFICATION IN DEVELOPMENT STUDIES**, at the University of the Free State is my independent work, and I have not previously submitted similar work for qualification at another institution of higher education.

I further cede the copyright of this thesis in favour of the University of the Free State.

_____ 22-02-2024

NAME DATE

DEDICATION

I dedicate this piece of work to my son**, Tavonga Patrick Jr and** Daughter**, Christabel Taropafadzwa.** Wisdom is Power**.**

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ABSTRACT

The phenomenon of mine closure is increasingly gaining credence as a research focus due to the economic, social, and environmental challenges communities experience in the post-closure environment. Resource depletion and social and political threats account for the closure of several mines globally. In South Africa, closure is attributed to most mines being too old and no new minerals are being discovered. The Tshikondeni coal mine in Limpopo faced closure due to mineral depletion. A gap that has been observed is that not much has been done regarding the impact of mine closure on the livelihoods of coal miners. This phenomenological study, therefore, examined how the former mineworkers at the Tshikondeni mine sustained their livelihoods after the closure of the mine in 2014. The main problem explored was how the former mineworkers acceded to the mine closure's social and economic realities. A sustainable livelihoods framework was utilised to understand the lived experiences of mineworkers after the mine closure. Data was collected using in-depth interviews, and snowball sampling was adopted to identify the former mineworkers at Tshikondeni who experienced the mine closure. A thematic approach was adopted for data analysis to extrapolate critical themes and meanings from coded data from the recorded interviews with the former mineworkers.

Key Works: Mine Closure, Livelihoods, Socio-Economic Aspects, Tshikondeni, Adaptation, Mine Workers

LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
CSR	Corporate Social Responsibility
WB	World Bank
UNDESA	United Nations Department of Economic and Social Affairs
ICMM	International Council of Mining and Minerals
APEC	Asia-Pacific Economic Cooperation
NEPA	National Environmental Policy Act
IBRAM	Brazilian Mining Association
IFC	International Finance Cooperation
SLA	Sustainable Livelihood Approach
UNSD	United Nations Sustainable Development
ANC	African National Congress
MHSA	Mine Health and Safety Act
NEMA	National Environment Management Act
EMP	Environmental Management Program
DME	Department of Minerals and Energy
BEE	Black Economic Empowerment
NWA	National Water Act
MPRDA	Minerals and Petroleum Resources Development Act
DMRE	Department of Mineral Resources and Energy
CSIR	Centre for Industrial Scientific Research
RMDECs	Regional Mineral Development and Environmental Committees

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CHAPTER ONE

1.1. INTRODUCTION AND CONTEXTUALISATION OF THE STUDY

Globally, there is an acknowledgement that mining sustains national economies by contributing significantly towards the gross domestic product (GDP) through exports (McKenzie, 2020; Ericsson and Lof, 2019; International Finance Corporation, 2014). In South Africa, mining as an industry has existed since the discovery of gold and diamonds in 1860 (Watson and Olalde 2019). The extractive industry has been at the epicentre of economic growth and development in South Africa (Marais, van Rooyen, Nel and Lenka, 2015). The mining industry is revered for its significant contribution to the country in terms of employment creation, infrastructure development, and overall revenue generation (CSIR, 2019; Marais, van Rooyen, Nel and Lenka, 2015; Swart, 2003). In some contexts, through corporate social responsibility (CSR), mining has transformed community livelihood through infrastructure developments like schools, hospitals, shops, and malls (Bainton and Holcombe, 2018; Mancini and Sala, 2018; Rhee et al., 2018; Marais et al., 2015; Laurence, 2006).

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Despite the catalytic role of mining in economic growth and development, the global reality is that minerals are finite and non-renewable resources, and depletion and closure are inevitable (March,2017; World Bank,2002). Europe endured a wave of mine closures between the 1960s and 70s due to a fusion of social, economic, and natural factors (Van Heerden, 20016; Nel and Binns, 2002). Massive closures were attributed to labour disputes, coal depletion, decreased demand for coal due to alternative energy sources, and high labour costs (Van Heerden, 2016). Similarly, South Africa's mining sector is on a declining path since most mines are 50 years old and above, coal and gold mine closures are increasing nationwide, no new minerals have been discovered, and erratic electricity has negatively impacted the mining sector (Mbazima,2020; Watson and Olalde, 2019).

While mining is integral for economic growth and development, the costs associated with closures are adverse. A study by McKenzie (2020) underscores the adverse impact of flawed mine closure planning on the livelihoods of mineworkers and mining communities. Too much focus on environmental and physical aspects of mine closure allegedly overshadowed the social and economic ramifications of mine closures (Mckenzie, 2020; Everingham and

Mckenzie, 2019; Vivoda and Kemp 2019; March 2018). A socio-economic examination of mine closure by Rhee et al. (2018) shows that the dividends that come with mining, such as CSR, usually vanish when the mine closes, especially without a proper closure plan. Studies show that when CSR ceases to exist, it weakens the community's capacity to withstand social and economic pressures (Bainton and Holcombe, 2018; Rhee et al., 2018). Studies further show that ill-planned mine closures usually destabilise several facets of local community well-being, such as access to quality health care, food, shelter, education, and clean water (Bainton and Holcombe, 2018; Mancini and Sala, 2018).

Thus, Owen and Kemp (2018, p.4) bring another angle of mine closure that recommends "risk anticipation, opportunities and treating mine closure as an ongoing process than a once-off event". That means planning for closure should constantly consider human and non-human aspects of the process to mitigate the impact of closed mines and "offset the social, economic and environmental costs " (Cui et al., 2020, p.1022). There is a consensus that mine closures inflict lasting damage on the communities as they struggle with adjusting to the social and economic dislocations (Vivoda and Kemp,2019; March 2018).

Considering the above, the Tshikondeni mine in Limpopo, which closed in October 2014 after operating for 32 years, negatively affected over 1000 mineworkers through job losses (Stacey et al., 2010). The social and economic disruptions caused by the mine closure gave impetus to this study that examines how the former mineworkers have managed and sustained their lives post-mine closure. This study utilised the sustainable livelihoods framework as its building block to understand the impact of mine closure on the welfare of mineworkers. A detailed discussion of the conceptual framework of the study is provided in Chapter 2.

1.2 Problem statement

Studies on mine closures reveal the challenge of being fixated on environmental and physical dimensions without considering the socio-economic aspects of mine closures (Everingham and Mackenzie, 2019; Vivoda, Kemp and Owen, 2019; Bainton and Holcombe, 2018). Extant literature further discusses the negative side of mineral-based development in scenarios where

mineworkers and communities entirely depend on the mine for their livelihoods. Closing mines is usually associated with destabilising livelihoods (Ackermann et al., 2018; Bainton and Holcombe, 2018; Marais et al., 2015; Stacey et al., 2010). In the absence of an alternative source of income, mine closures may inflict lasting damage on the communities as they struggle to adjust to the social and economic dislocations caused by mine closures (Ackermann et al., 2018; Stacey et al., 2010; World Bank 2002). This study investigated how the former mineworkers at the Tshikondeni mine sustained their livelihoods after the mine closure. Considering that when mine closes, employees generally strain, this study further examined how mineworkers have been or not resilient in post-mine closure environment. Thus, the resilience systems and coping mechanisms in place to withstand mine closure's social and economic realities were examined. Focus on resilience emanates from how people or individuals develop and regain a sense of well-being or meaning despite challenges or situations confronting them (Hassani et al., 2017; UNDESA, 2013). That involves the capability of individuals to mitigate vulnerabilities (Clinton, 2008).

In existing work on closure at Tsikondeni, Nephalama and Muzerengi (2016) focuses on environmental hazards like underground water contamination caused by coal mining. Llewellyn (2018) examined environmental and physical dimensions such as noise, air pollution from dust, and house cracking through blasting. Not much has been done to explore the social and economic decisions of mine closure at Tshikondeni mine. This study, therefore, closes the gap by looking at the social and economic aspects of a mine closure based on the lived experiences of former mineworkers.

1.3 Aim of the study

The study investigated how the former mineworkers sustained their livelihoods after the mine closure.

1.4 Study Objectives

The study objectives were:

- To understand the context of mine closure at the Tshikondeni mine.
- To examine the social and economic consequences of losing a job following mine closure.

- To understand how the former mineworkers sustained their livelihoods after losing their jobs.
- To offer policy recommendations for mitigating social and economic costs of mine closure.

1.5 Research methods

This section describes the methods employed in the study. It starts by discussing the research approach and design. It then moves to the data collection method and sampling strategy and ends with data analysis.

1.5.1 Description of the study area

Tshikondeni mine is situated in Thulamela Municipality in the Vhembe District of the Limpopo Province of South Africa. It is located on the Northeastern corner of the Limpopo Province and stretches for some 100km east of Tshipise and 17 KM southeast of Masisi. The Mine is adjacent to the Livuvhu River and the Kruger National Park 140 KM on the east, the Makuya Nature Reserve, and the Greater Limpopo Transfrontier Park. The Exxaro Resource Limited, a coal-producing mining company, owned the Mine. The coal mining operations started in 1984 and closed due to coal depletion in October 2014. The area is strategically positioned for eco-tourism as a significant economic activity (Exxaro Press Release, 2019; miningdataonline.com).

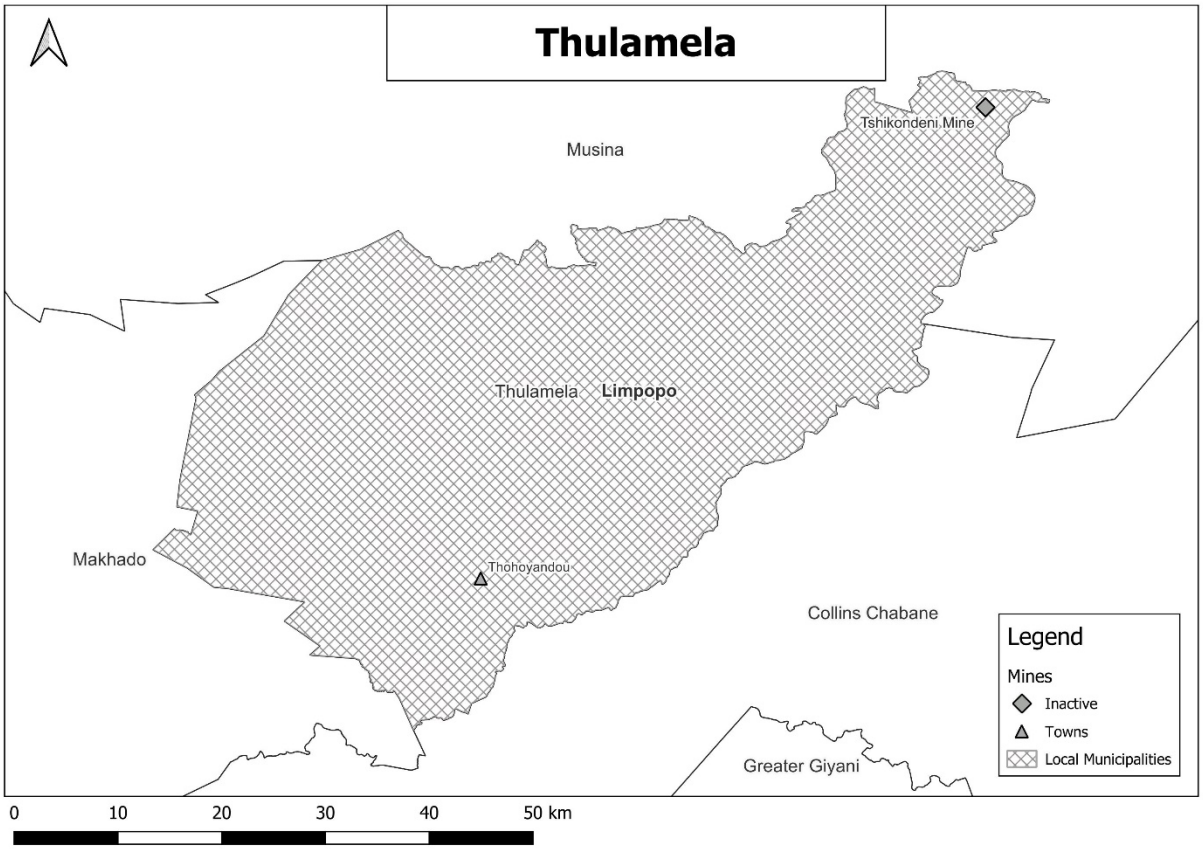

Figure 1.1: The Location of Tshikondeni Mine in Thulamela Municipality in the Limpopo Province of South Africa

1.5.2 Research approach and design

This study utilised a qualitative research approach, fundamentally an interpretive method concerned with interpreting and understanding experiences and finding the meaning of how the social world is produced (Mason, 2017). The approach is vital for unpacking complex issues regarding the mine closure and the lived experiences of former mineworkers at the Tshikondeni mine. Utilising a qualitative approach with a phenomenological design offered insight into understanding the social and economic realities of the former mineworkers in the aftermath of the mine closure. One strength derived from a qualitative approach is that meaning is socially constructed by interacting with social phenomena (Marrian, 2015; Creswell, 2005). The approach aligned with the phenomenological design involved my active interaction with the social phenomena being studied (Marrian, 2015). A qualitative approach resonates with the study's aim and objectives because it is naturalistic and allows for

extrapolating first-hand information through interaction with social phenomena (Mouton, 2015).

The study's explorative nature aimed to understand former mineworkers' social and economic realities of mine closure (Creswel, 2015). Since there was a knowledge gap regarding how the former mineworkers sustained their livelihoods, an explorative study offered an in-depth understanding of their livelihoods. Babbie (2017) opines that a qualitative research approach is essential for exploring a phenomenon from the insider's perspective, who is a participant. Furthermore, qualitative research helps explore and gain an in-depth understanding of people or individuals' understanding of a phenomenon in a natural setting (Marshall and Rossman, 2014; Connelly, 2010; Creswell, 2007). Another strength derived from a qualitative approach is its appreciation that society is not homogeneous. Hence, individuals may have different experiences and interpretations of a phenomenon (Connelly, 201o). An appraisal of qualitative research advanced by Ritchie and Lewis (2003) is that the approach allows for exploring and studying a phenomenon from the participant's perspective, which was the prime focus of this study.

A descriptive phenomenology design was adopted to explore the mine closure lived experiences of the former Tshikondeni mineworkers. The prime objective of a phenomenology research design is to understand people's experience of a phenomenon (Creswell, 2015; Connelly, 2010). As Giorgi (2008) explains, in a phenomenology research design, the researcher is not concerned about the causes of a phenomenon but people's experiences. A descriptive phenomenology design was desirable because it is reflective and inductive. It allowed for understanding individuals' (in this case, former mineworkers) lived realities of a mine closure (Vagle, 2018; Reiners, 2012; Wojnar and Swanson, 2007). As opined by Vagle (2018), unique to the phenomenology design is bracketing or suspending personal conceptions about the issue being examined. That guards against misrepresenting reality and allows for understanding phenomena from the perspective of the people involved. In the process, the truth can be established as experienced by the participants (former mineworkers). Another strength of descriptive phenomenology presented by Shaw (2001) is that it limits researcher bias since there is no a priori position. Thus, Eatough and Smith (2008) laud phenomenology design for generating first-hand information by interacting with the relevant

participants, in this case, former mineworkers.

1.5.3 Data collection methods

Because the study adopted a phenomenology research design, it was imperative to conduct face-to-face, in-depth interviews with the former mineworkers who had experienced the phenomenon of mine closure. McNamara (1999) describes an in-depth interview as a verbal discussion between the interviewer and the interviewee to collect information relevant to the end goal of a research. Gillham (2008) adds that an interview is a conversation between two individuals in which the interviewer seeks answers to specific questions. In that context, the interviewee is the source of answers to the questions.

In-depth interviews were considered ideal because they allowed for exploring and understanding a social reality from the perspective of those who experienced the situation (Maxwell, 2012; Smith, Flower and Larkin,2009). The former mineworkers were engaged in their natural environments to allow them to provide narratives of their experiences following the closure of the mine. In the context of a phenomenology design, data involves perspectives and descriptions of phenomena by those who have experienced it (Groenewald, 2004). That means all the narratives and conversations collected through in-depth interviews constituted data (Gorgi, 2008). Furthermore, the study's use of face-to-face, open-ended, in-depth interview questions was desirable because of the flexibility and room for further probing. The researcher was able to follow up with clarity-seeking questions and generate information that could not be found using closed-ended questionnaires. Fundamentally, in-depth interviews align with the phenomenology design that strives to understand the issue from the perspective of one immersed in a situation.

An interview guide was crafted to keep the interview focused and for deeper exploration and understanding of the phenomena **(Annexure Three: Interview guide)**. A further strength of utilising in-depth interviews was that questions could be modified to align with the research objectives. Another strength associated with in-depth interviews is the ability to generate rich data, which, in this study, means a deeper exploration of coping and resilience strategies of

former mineworkers (Babbie, 20017; Blanche, et al, 2006). Through open conversations, I could extrapolate meanings and understanding of former mineworkers lived realities of a mine closure.

Considering that the study site, Tshikondeni mine, is rural, where Tshivhenda is the dominant language, in-depth interview questions were translated from English to Tshivhenda to allow the former mineworkers to converse in their mother language. I also took cognisance that some of the ex-mine workers may be unable to converse fluently in English. In-depth interview conversations were recorded to capture the voices of the former mineworkers in their original form and later transcribed. Since I am not fluent in the Tshivenda language, I secured the services of two research assistants who are Venda-speaking to translate the questions into the vernacular and interview non-English speakers in the comfort of their home language. Field notes were taken to complement in-depth interviews as part of data collection. As Palmer et al (2010) advised, field noting involves jotting down the keywords that will help recollect events when doing final reporting.

To avoid researcher bias, I constructed clear and concise in-depth interview questions that were not leading. As Yin (2013) advised, I reflected on my prior knowledge of the explored issue and bracketed all preconceived ideas to ensure data trustworthiness. Maxwell (2012) and Babbie (2017) observe that the researcher's values, theories, or preconceived ideas could distort study findings. Whatever knowledge or insights I had about the closure of the Tshikondeni mine did not impact the interview findings because I entered the social phenomena with the spirit of enquiry and not advocacy. That allowed the data generated to speak for itself (Vagle, 2018). Given the qualitative nature of this study, I relied on the synergy of secondary sources of data such as newspapers, published articles and books, and primary data sources like official reports on the Tshikondeni mine.

1.5.4 Sampling strategy

The study population (former mineworkers) was in villages around Tshikondeni mine- Bende Mutale, Masisi, Mutele A and B. These villages were chosen based on their standing as labour providers. (Table 1 shows the demographics of the study populations) Former mineworkers

were targeted because that aligned with the study's aim of exploring how they sustained their livelihoods in the post-mine closure dispensation. Initially, I targeted fifteen men and women who had worked at the Tshikondeni mine, but I interviewed twelve because of data saturation. Marshall et al. (2013) argue that data collection stops unless new information arises to save time and resources. Of the twelve, four were women. Regarding the selection of the study participants, snowball sampling, a non-probability sampling technique, was utilised. Yin (2013) postulates that a non-probability sampling technique is ideal for focused qualitative studies with a case study design to investigate a real-life phenomenon.

The sampling technique was considered appropriate, considering the challenge of locating mining workers in the identified remote villages around the Tshikondeni mine. Most of these villages were remote and further apart, and the snowballing approach mitigated the challenge. The approach was that I was helped to identify one member of the study population (mineworkers) who assisted me in locating the other former mineworkers (Babbie, 2017; Maree and Pietersen, 2016). In this case, Babbie (2017, p.197) describes the referral process as "chain referral", where each identified participant identified the next.

Twelve or fifteen appear to be a small sample size from a quantitative perspective. However, Sandelowski (1995, p.183) states that small samples provide a “deep, case-oriented analysis” of qualitative data. Morse (2000) supports the idea that there is no need for a large sample size because more usable data is generated from each participant.

Table 1: Demographic composition of the study participants

Participant Number	Village	Gender	Age	Marital status	Occupation at the Mine	Duration of employment
1	Bende Mutale	Male	70	Married	General hand	20
2	Bede Mutale	Female	65	Single	Cook/tea lady	32
3	Bende Mutale	Male	71	Widower	General hand	22
4	Bende Mutale	Male	62	Married	General hand	32
5	Masisi	Male	47	Married	Machine	10

					Operator	
6	Masisi	Male	63	Married	Driver	33
7	Mtele A	Female	50	Single	Cleaner	7
8	Mtele A	male	66	Married	General Hand	21
9	Mtele A	female	60	Single	Chef	22
10	Mtele A	female	64	Widowed	General Hand	21
11	Mtele B	male	55	Married	Boilermaker	10
12	Mtele B	male	60	Married	Welder	18

The interviews were divided into two phases, with phase one focusing on the story of being employed at a mine. That required the former mineworkers to narrate how they initially got a mining job, how long they worked in mining when they lost the mining job and how they lost that job. The second phase of the in-depth interviews focused on life after losing a job. Questions covered in this case pertained to whether people applied for another job, the levels of success in their applications, the consequences for them and their families after losing this mining job, alternative sources of livelihood and how easy or difficult it was to make a living after mining. Participants could express themselves freely since the same questions asked necessitated narration of their experiences and life after a job loss to mine closure.

Most participants were married, while two were widowed, and three were single. Their previous occupation at the mine ranged from skilled to unskilled workers. Many of the participants were unskilled and working as general hand workers. Their jobs ranged from cooking, cleaning, and general work in the mine.

1.5.5 Data analysis

Since the study sought to understand the mineworkers' lived experiences of mine closure, the audio-recorded in-depth interviews were transcribed to "convert spoken word into the written word" (Sutton and Austin, 2015, p.228). The process of verbatim transcription involved translating the recorded in-depth interviews from Tshivhenda to English. Verbatim data was coded by identifying similarities, differences, and topical issues from the captured narratives. An inductive thematic approach to data analysis was utilised, necessitating the derivation of

themes, data patterns, and nuances from the responses. The extrapolated themes were considered relevant to address the research questions and to ensure that study findings are aligned with the research questions. In thematic analysis, the researcher closely examined the collected data to identify common themes such as topics, ideas, and patterns of meaning that continuously emerged, as postulated by Maxwell (2012). Thus, interpretive phenomenology analysis helped to understand the meanings individual participants attached to the phenomenon. Wats and Clifton (2006) hail the approach as it goes beyond descriptive phenomenology, understanding the problem from the participant's perspective.

1.6 Ethical considerations

Like every scientific inquiry, academic research requires one to adhere to sound ethical conduct in research and presenting the findings. Since my study involved human subjects (former Tshikondeni mineworkers) as key informants, adhering to fundamental ethical principles governing research conduct was imperative. To begin with, I secured ethical clearance from the University of the Free State's ethics committee to conduct the study. Since most of the former mineworkers resided in villages under the control of local chiefs, I received approval from the concerned traditional authorities to conduct my research within their jurisdiction. All participants agreed to participate in the study and signed written informed consent forms to show their voluntary participation. (**Annexure Two: Informed consent forms).** Pseudonyms were used to conceal the identity of the study participants. This was for integrity and privacy as they narrated their life stories about working at the Tshikondeni mine.

1.7 Significance of the study

The study aims to contribute to the knowledge of mining decline and sustainable livelihoods in South Africa. By contributing to the knowledge production chain, this study was a broader part of engaged scholarship towards awareness of community-specific interventions in post-mining communities in rural areas. Fundamentally, the study adopted a solution-oriented scholarship to minimise closure and sustainable livelihoods by reflecting on the experiences of the former mineworkers at the Tshikondeni mine. The study further contributed to the body of knowledge on the social and economic aspects of mine closure from the perspective of the afflicted mineworkers.

1.8 Limitations of the study.

Considering the nature of the topic of mine closure, it would be more comprehensive if former mine workers from all nearby communities were also interviewed. Because of time and resource constraints, the study was limited in terms of time and scope. Only four villages were covered, and twelve former mineworkers participated.

CHAPTER TWO

SUSTAINING LIVELIHOODS AFTER MINE CLOSURE: A REVIEW OF THE LITERATURE

2.1 Introduction

The study investigates coping mechanisms and resilience systems to ensure sustainable livelihoods for mineworkers who lose their jobs. Currently, there is no study on livelihood resilience mechanisms focusing on mineworkers who have lost their jobs. This study adopts an exploratory case study to examine the coping strategies and resilient systems in place for the former Tshikondeni mineworkers post-mine closure. The main question pertains to how the former mineworkers have acceded to mine closures' social and economic realities.

This chapter provides a comprehensive review of the literature relevant to the study. The chapter deals with the following relevant themes: conceptualising mining closure, the mining community, the global experiences of mine closure, and the social and economic ramifications of mine closures globally and in South Africa, specifically. To comprehend the impact of mine closure on the lives of mineworkers, the Sustainable livelihoods approach is utilised.

2.2 Understanding mine closure.

A substantial body of literature addresses the subject of mine closure (Marais, 2022; Marais et al., 2021; Vivoda et al., 2019; Bainton and Holcombe; 2018, Botha et al., 2018; Ackerman et. al,2018, Sesele et al., 2021). Mine closure involves several processes, such as the relinquishing of the mining license, social closure, decommissioning, and rehabilitation (Bainton and Holcombe, 2018; Ackerman Van der Waldt and Botha, 2018). For O'Faircheallaigh and Lawrence (2019, p.65), the term mine closure includes the continued effect of mining for decades "after mineral extraction ceases". The International Council of Mining and Minerals (ICMM) envisages a framework that considers the environment and social matters (ICMM, 2019). Bainton and Holcombe (2018, p.3) prefer the notion of "social closure", where the attempt is to deconstruct the conventional dominance of "technical environmental and physical impacts of mine closure". They also consider mine closure from the perspective of transfer of ownership as larger mining companies sell the mine to small and prospective mining companies (Bainton and Holcombe, 2018). In situations of ownership transfer, however, a scenario of “unstructured closure or abandonment of mines” is usually the outcome as the smaller mines face the challenge of financial sustainability (Bainton and Holcombe, 2018, p. 52).

Fourie and Brent (2005) argue for a more people-oriented dimension that considers livelihoods' implications. This broader approach considers the effects of the closure on families, households, communities, and local governments. Long (2004) says mine closure should go beyond regulations and consider that the mine operates in social terrains. For March (2018), mine closure is an inevitable end that envisages operations' termination and translates to job losses for many people. Mine closure usually occurs when there is a depletion of minerals (Lawrence, 2006). But mine closure also results from geological reasons, natural disasters such as landslides, earthquakes, and financial crises (Ackerman et al., 2018). Heikkinen, Noras and Salminen (2008, p. 21) define mine closure as the final stages of mining undertakings when final production and processing have been permanently halted. The process involves the general shutdown of mining activities and the relinquishing of mining rights by the previous owner(s).

2.3 Understanding mining communities.

The definition of what constitutes a community is central to the discussion of mine closure. Chuhan-Pole, Dabalen and Land (2017) say that it is essential to understand how mining operations interact with local communities. In terms of International Law, the rights of indigenous people or communities over mineral resources take precedence (United Nations-General Assembly, Resolution 1803 of 1962). In the absence of scholarly consensus on what constitutes indigenous peoples, sharing cultural identity, and a close affinity with the land that people occupy includes a measure for the indigenous community (United Nations-General Assembly, Resolution 1803, of 1962). Warden-Fernandez (2001) elaborates that indigenous people or communities may concern minority groups whose land occupation pre-dates colonialism. Such people share the same culture, language, and religion. The definition considers the "indigenous households or families with an ancient and cultural attachment" to the land where mining occurs (Dabalen and Land, 2017).

Another conceptualisation of the mining community looks at "occupational communities", implying those groups of people that partially or wholly depend on the mine for their income (Chuhan-Pole, Dabalen and Land, 2017, p. 108). It can also include residential households or families residing within the geographical parameters of the mining area. The classification covers host communities where mining takes place, or within the vicinity, or further away but directly affected by mining operations either socially, economically, or environmentally (Dabalen and Land, 2017; Mining Charter of South Africa, 2010; Molefe et al., 2006; Velga et al., 2001). Host communities may also imply municipalities adjacent to where extraction or mining is happening (Heyns, 2019).

Mining communities include people who settled before the mine and those who settled because of the mining operations. Kemp (2010) argues that a definition should include landowners that do not reside in the mining area, and those linked to the mine along production and supply chains, like communities living downstream of the mining operation. Another perspective by March (2017) sees the community as people, residents, villagers, or townsfolk occupying a mining territory. Ackerman et al. (2018) elaborate on mining communities involving labour-contributing areas adjacent to the mine from the workforce pool.

Appropriate to the definition of a mining community is the notion of sustainable mining communities (Molefe et al., 2006; Velga et al., 2001). As postulated by Molefe et al. (2006), sustainability in the mining community considers the ability to lead normal social and economic activities post-mine closure. Velga et al. (2001) concur that ensuring ecological sustainability, economic viability (alternative means of survival), and social equity are necessary measures of sustainability for post-closure mining communities.

The following section reflects on the global experiences of mine closure and the frameworks governing closure.

2.4 Global experiences of mine closure

In 2002, the World Bank issued a warning about the rapid closure of mines (World Bank,2002). March (2017) notes that minerals are finite, and so, every mine will face closure. Studies, however, show that a wave of mine closures in Europe between the 1960s and 1970s was because of the fusion of social, economic, and natural factors (Van Heerden, 2016; Nel and Binns, 2002). Examples of the affected countries are Ruhr (Germany), Lorraine (France), Liguriain (Italy) and Wallonia (Belgium) (provide source reference). These closures resulted from labour disputes, depletion of coal, decreased demand for coal due to alternative energy sources, and high labour costs (Van Heerden, 2016). Other reasons for closure included volatility of commodity prices, operational costs, geotechnical challenges, a breach in environmental regulations and safety, civil wars, conflicts, tensions with local communities, and labour tensions that may compel mines to close even though minerals are still abundant (March, 2017; Owen and Kemp, 2018). While some closures are attributed to the depletion of minerals, closure often occurs because the cost of production exceeds the selling price (Luarence, 2011; Everingham and Mackenzie, 2019). For example, experiences of mine closure in Australia result from the declining demand for coal and uranium, rather than the depletion of the mineral resources (Laurence, 2011).

Another driver for mine closure identified by Cloete and Marais (2021) pertains to the decline in the demand for coal since the signing of the Paris Agreement in 2015. The global call for a shift from fossil fuel to renewable energy sources means that the world is slowly abandoning coal (Cloete and Marais,2021; van der Watt and Marais, 2019; Burton et al., 2019). Furthermore, global concerns about air pollution, climate change, and reducing greenhouse emissions are the primary reasons for the decline in the demand for coal as countries are opting for alternative clean, smart, and renewable energy sources (Strambo, Aung, and Atteridge, 2019). Related studies on mine closures present the perspective of disaster-induced closures (Asia-Pacific Economic Cooperation-APEC,2018; Parshley and MacCallum,2016, Hockley and Hockley,2015). The 1966 rock dump slide disaster at Aberfan in Wales is cited as a case study.

2.6 The South African mining closure context

Evidence shows that the mining sector contributes significantly to economic growth and development in South Africa. The South African commercial mining industry dates to the 1860s and has been pivotal to the development of Johannesburg (Watson and Olalde 2019, Minerals Council of South Africa 2018, Chamber of Mines of South Africa 2017). The International Finance Corporation (2014) posits that political stability in the post-apartheid dispensation attracted foreign direct investment in mining, leading to further growth. Coal mining also dates to the 1800s when KwaZulu-Natal, the Free State, and Limpopo were the dominant coal-producing provinces (Molefe et al., 2006). According to the Chamber of Mines of South Africa (2017), mining contributes about R312 billion to the country's GDP. In terms of investment, statistics further show that mining contributes 18,2 per cent of private sector fixed investment (Chamber of Mines of South Africa, 2017). Furthermore, the mining industry contributes directly to about 450,000 jobs (Minerals Council of South Africa, 2019). Mining, therefore, has a substantial influence on livelihoods in South Africa. Watson and Olalde (2019) have identified the Northern Cape, Northwest, Limpopo, Mpumalanga, and the Free State as the primary mining provinces in the country.

Despite mining being integral to the economy and development of South Africa, the reality on the ground is that the mining sector is in decline. Watson and Olalde (2019) attribute the development to the observation that most of the mines are 50 years old, while at the same time, coal and gold mine closures are increasing nationwide.

Mathebula (2020) is critical of the mining industry because of its exploitation and impoverishment of the mining communities at closure. It is argued that the extractive industry takes advantage of the state's failure to enforce mining laws and protect the rights of the affected mining communities. Mathebula (2020) says that some mine operations cease without securing closure certificates. Pikirai and Magoma (2021) lament the discovery of coal at the Tshikindeni Exxaro mine for damaging the physical environment and compromising people's livelihoods. There are reports of tampering with sacred places, thereby, undermining the area's cultural values. Molefe et al. (2006, p.40) underscore the importance of "socio-economically sustainable communities post-mine closure". Thus, community livelihoods are at stake since they depend mainly on the mine's survival.

2.7 Socio-economic ramifications of mine closure

There is growth in the body of literature that addresses the social dimensions of mine closure (Marais, 2020; Sesele et al., 2021; Cloete and Marais,2021; Crous et al., 2020; Vivoda et al., 2019; Bainton and Hlcombe, 2018). Studies by Xavier, Viega and van Zyl (2015) attribute the growth in research on social dimensions of mine closure to the need to counter the exclusive focus on environmental concerns. Marais (2022, p.53) notes the existence of buzzwords like “socially responsible mining, a social licence to operate, and corporate social responsibility” which do not reflect on the salient post-mine social, economic, and cultural aspects. Precisely**,** conventional scholarship on mine closure in the national, regional, and international spheres focuses primarily on what Vivoda and Kemp (2019) address as physical aspects of mining (environment and post-closure rehabilitation) while ignoring the complexities in the social and economic spheres. Often, the regulations on mine closure are silent about the social aspects of closure. The gap is attributed to the location of most mines in remote and politically sensitive settings that make the places inaccessible (Vivoda and Kemp, 2019).

Despite the international guidelines that make closure integral to the life cycle (International Council on Mining and Materials, 2019), evidence on the ground shows that this is seldom applied (Grant and Lacy, 2016). Thus, the primary focus on mine closure is on the alterations and distortions on the environment (Mckenzie, 2020; Everingham and Mckenzie, 2019; Chaloping- March 2018; Van Heerden, 2016; Parshley and MacCallum, 2016; Madebwe, 2004). A nuanced contribution by Molefe et al. (2006) is that the post-mine closure debate should focus on the land and environment on which the mine operates. Thus, Bainton and Hlcombe (2018, P. 368) explain the social aspects of mine closure as “socio-economic, political, cultural and institutional impacts” experienced at the end of the mining cycle.

While mining is integral for development, the social and economic costs associated with closures are adverse to local economic development and employment creation (Vivoda and Kemp (2019). A concerning development is that mining towns that experience mine closures experience a decline in employment and public service provision (Everingham and Mackenzie, 2019; Laurence, 2011). For example, the Ranger Uranium mine in Australia started operations in 1982, and the closure plan was only crafted in 2018. Despite employing 1100 people, the closure plan focuses more on environmental issues and is silent about the social and economic ramifications on the livelihoods of the people in Jabiru (Everingham and Mackenzie, 2019). Similarly, a post-mining land-use study in Finland (Kevinen, 2017, p. 2) revealed that most mines were confined to the rural spheres and leave a legacy of land distortion such as "open pits, waste rock dumps and tailings". Rural communities are left with the mammoth task of dealing with degraded landscapes and distorted environments (Kevinen, 2017). Parshley and MacCallum (2016) discuss the bad legacy of mine closure, citing the Berkeley Pit in Montana, the Giant Mine in Canada, and the town of Leadville in Colorado. Parshley and MacCallum (2016) further cite the 1966 Aberfan, Wales waste rock dump that slid into the coal mine village claiming 144 people, as a bad historical legacy of mine closure that created the impetus for mine closure policy.

A study by McKenzie (2020) underscores the adverse impact of flawed mine closure planning on the livelihoods of mining communities. An example has been made of Argentine's 2019 Guide, which allegedly does not guarantee any compensation for closure-associated costs.

Another dimension of mine closure costs reveals the experiences of migrant mineworkers who face severe economic disruptions and struggle to be absorbed into the mainstream labour market (March 2018 and Hollywood, 2002). Based on experiences of mine closure in Zimbabwe, a study by Madebwe (2004) reveals that Zimbabwean nationals received a soft landing and joined other mines after the closure of the Rio Tinto mine in Zimbabwe in 1992. This was not the case with non-nationals who faced the challenge of absorption into the mainstream labour markets (Madebwe, 2004).

There are also reports about crumbling infrastructure, dust generation, water pollution, obstruction of rivers by the quarry, and dumping of sand and scrap metals (Siyongwana and Shabalal, 2019; Parshley and MacCallum,2016). Evidence from the Kabwe mine in Zambia which closed in 1994, shows the social consequences due to extreme soil contamination by lead, mercury, and chromium (Currington, 2017). Reports of brain damage, blindness, and paralysis among children due to water and soil positioning by these minerals are a testimony of how communities bear the consequences of botched mine closures.

Drawing from the experience of mine closure in Emalahleni in the South African context, Cloete and Marais (2021) employ the social disruption theory to illustrate the adverse implications of mine closure on individuals and communities. Fundamentally, they reveal how mine closure disrupts people's attachment to the place where they live. Arguing from the perspective of belonging, Cloete, and Marais, (2021) and Fried (2000) concur that, as people live in a place, they develop shared social identity and cultural values that define them as a community (Cloete and Marais, 2021). The trend, as noted by Cloete and Marais (2021), is quite common among low-income families.

Further studies on the social aspects of mine closure in South Africa bring a gendered dimension to show African women's vulnerability to mine closure (Sesele et al., 2021). They utilised the Free State Goldfields case study to show how mine closure "affects gender relations and gender roles" (Sesele et al., 2021, p.2130). An important revelation pertains to the masculine nature of the mining industry that employs more men than women. As a result, in situations where a mine closes, women are disproportionately affected given their

dependence on men for financial and material support (Sesele et al., 2021). More revealing is that men can scout for job opportunities elsewhere, leaving women stuck in the ghost mining towns. Since mine closure is usually associated with the erosion of mining benefits such as housing allowance and food parcels, women experience mine closure-induced poverty. As noted by Sesele et al. (2021), the result is that women are exposed to risky social behaviours like prostitution and crime, as they strive to fend for their children. Again, as men struggle with job loss pressure, incidents of gender-based violence and marriage breakdown become a norm. Overall, at the household level, the burden of caregiving and fending for the family is easily transferred to poor women (Sesele et al., 2021). The same authors report incidents of robberies, burglaries, and drug abuse by young people.

Scholars, Siyongwana and Shabalala (2019), Ntema et al. (2023), and Rixen and Blangy (2016) discuss post-closure stress that confronts most families and communities that depend on the mine for their livelihoods. Based on closure experiences at the Tulawaka mine in Tanzania, in 2005, Rhee et al., (2018) report mental health problems due to depression and economic stress. Further studies on loss of livelihoods and mine-related unemployment show the challenge of most mines in preparing their employees for post-closure lives (Molefe et al., 2006). Similar experiences were reported at the OK Tedi mine in Papua New Guinea, March (2018). There is consensus that mine closures inflict lasting damage on the communities as they struggle with adjusting to the social and economic dislocations (Vivoda and Kemp, 2019; March 2018; Molefe et al., 2006).

Mancini and Sala (2018) discuss salient aspects of social destabilisation associated with mine closure, citing the incidence of crime and violence. Stressing the same point regarding social ills associated with mine closure, Ntema et al. (2023) and Ennis et al. (2014) note that people resort to illegal ways as they scavenge for survival. Evidence shows that communities in deserted mining towns face social destabilisation leading to violence and crime (Mancini and Sala, 2018). Related repercussions of closure include unemployment and the struggle for survival in deserted mining towns that compromise people's safety (Vivoda and Kemp, 2019). Negative social impacts of mine closure discussed by Vivoda and Kemp (2019) include the alterations in the demographic structures and disruptions of social networks as people migrate

to other places to seek a better living. The challenge of out-migration has been extensively discussed by Strambo et al., 2019; Marais and Cloete, 2015; Walsh, 2012; Haney and Shkratan, 2003; Hollywood, 2002).

Research shows that skilled mine workers usually vacate the mining towns after closure to seek better opportunities, while the less skilled are unlikely to out or migrate (Strambo et al., 2019; Haney and Shkratan, 20003; Hollywood, 2002). Furthering the debate on varying implications of mine closure, Molefe et al. (2006) argue that semi-skilled mine workers are easily absorbed by other mines, compared to the unskilled who essentially join the pool of the unemployed. Marais and Cloete (2015) highlight the dangers of mining towns' mineral-dependent economies, triggering out-migration. They allude that in the absence of alternative economic activities, the inhabitants are compelled to vacate in search of better living. Strambo et al. (2019, p.5) raise another argument about "just transitions" wherein the absence of "alternative economic and social foundations" to sustain livelihoods, coal-dependent communities are impoverished. Similarly, Botha et al. (2014) highlight the challenge of creating ghost towns as people desert the inactive mining towns.

A Southern Africa study by Limpitla and Hoadley (2006, p.3) presents what they regard as the "paradox of poverty in the midst of plenty". It observes the adverse effects of mine closure, such as the impoverished communities' health, and environmental, economic, and other social stress. The deduction by Limpitla and Hoadley (2006) resonates with the resource case theory by Di John (2010, p.1) that mineral and fuel availability in developing countries accounts for their poverty and poor economic outcomes due to high levels of "rent-seeking and corruption". The same view is shared by Meyersfeld (2017, p.35), who argues that there is always an "anomaly of mineral wealth coexisting with social poverty". The submission is that, despite the creation of jobs, the wages earned by mine workers sustain their livelihoods. Meyersfeld (2017, p.3) brings the dimension of "empty promises [and] the myth of mining" to reinforce the point that, after mining, people are left to languish in poverty. The submission is that the extractive industry benefits from "impoverished contexts", which explains the "cycle of poverty" post-mine closure. The 2012 massacre of the Marikana mineworkers at Lonmin Mine in the North-West Province of South Africa offers insight into the reality that the proceeds from mining are not

meant to improve the human conditions of mine workers and the surrounding communities (South Africa Marikana Commission of Inquiry, 2015). Frye (2013) opines that the Lonmin Mine had not utilised the proceeds from mining to benefit the community and mine workers. As Meyersfeld (2017) articulates, mineworkers are paid token wages, which explains why they are always in debt, and escaping poverty becomes a mammoth task.

Limpitlaw and Hoadleyn (2006) exploit the dependence path to explain the plight of communities and mine workers using dependence, arguing that the situation is compounded by some governments assigning social services to mining companies in most remote areas, where mining activities occur. The practice creates dependency, and at closure or collapse, communities are left helpless. Kemp (2010) says that the dividends that are immediately realised when a mine start operating are watered down by poor closure plans, which result in various socio-economic and environmental risks that affect people after the mine closure.

Everingham and McKenzie (2019) reinforce that cross-sector collaborative planning that supports self-sustenance of the community, economic diversity and capacitating communities with resilience are imperative. Owen and Kemp (2018, p.4) bring another angle of mine closure that recommends "risk anticipation, opportunities and treating mine closure as an ongoing process than a once-off event". That means planning for closure should constantly consider qualitative and quantitative aspects of the process to mitigate the impact of closed mines, as well as "off-setting the social, economic and environmental costs (Cui et al., 2020, p.1022).

Literature focusing on the economic dimensions of mine closure at national levels exposes threats to local economic development, plummeting tax revenue, and the decline of corporate social support to the community (Siyongwana and Shabalal, 2019). As observed by Marais et al. (2021), many secondary cities' economies are mineral driven, and that single economic sector increases the vulnerability of the people after closure. The dividends that come with mining, such as corporate social responsibility (CSR), usually vanish when the mine closes, especially in the absence of a proper closure plan. Studies further show that when CSR ceases to exist, it weakens the community's capacity to stand social and economic pressures (Bainton and Holcombe, 2018; Rhee, et al., 2018). The implication is that several facets of the local

community well-being, such as access to quality health care, food, shelter, education, and clean water, usually gets destabilised by ill-planned mine closures (Bainton and Holcombe 2018; Mancini and Sala, 2018). Crous et al. (2020) stress that the closure of mines implies that mine-based schools may be forced to shut down, and in the process, compromise the quality of education. Similarly, mines provide affordable health care services, and upon closure, community health and well-being are threatened. Complicating the welfare of mine workers, as posited by Lawrence (2006), is that most mines would be under dire financial stress at the time of closure. That explains the diminished focus on the future of their workers. Vivoda et al. (2019, p.422) describe the outcome of a diminished focus on miners as the "front-end approach" during the mining community, and workers enjoy relative happiness yet, by the time of closure, resources will not be available to cater for their welfare.

2.11 Conceptual framework of the study: The sustainable livelihoods approach

To discuss how the former mineworkers sustained their livelihoods post-mine closure, insights are derived from the Sustainable Livelihoods Approach (SLA). There is an acknowledgement that the SLA has dominated the development discourse and that scholars examine the spheres of development through the lenses of SLA (Chambers,1995; Chambers and Conway, 1992). The 1987 Brundtland Report conceptualises sustainable development as the development that meets the current generation's needs without compromising the future generation's ability to meet their own needs (WCED,1987). Building on the outcome of the WCED on sustainable development, the SLA addresses various factors that constrain or enhance livelihood opportunities (Serrat, 2017). Thus, a livelihood is presented as capabilities, assets and activities required to live (Serrat,2017). Similarly, a livelihood is deemed sustainable based on its ability to cope with or recover from various shocks and stress and enhance capabilities both now and in the future (Serrat,2017). Similarly, Segerstedt and Abrahamsson (2019) explain the concept of sustainability as the ability to sustain an undesirable situation.

Chambers and Conway (1992) preferred the definition of livelihoods as having access to means for a living. Another perspective from Scoones (2013, p.172) considers adaptation,

transformation, and coping mechanisms as pathways to sustainable livelihoods. The Sustainable Development Agenda 21 advocates livelihoods as prioritising local people who understand development issues from a local-specific point of view (UNSD, 1992). In the context of the SLA, vulnerabilities are insecurities in the well-being of individuals, households, and communities, considering changes in the external environment (Serrat,2017). In addition, the SLA considers the external and internal shocks caused by a lack of ability and means to cope with these.

The SLA offers insight into understanding the social and economic aspects of mine closure, considering that "mining operations are temporary economic activities extending over a finite period (Goswami, 2014, p.338). Furthermore, poorly concluded, or closed mining activities leave a bad legacy with several sustainability implications. Goswami (2014) further notes that abandoned or botched mine closures result in people's livelihood loss as the economy is shattered. Sustainable mine closure, therefore, should guarantee economic and social sustainability or continuity. To address the social and economic aspects of mine closure, Goswami (2014) advocates a sustainable mine closure plan by setting aside financial resources to cater to affected communities or people, the environment, and ecological concerns. Segerstedt and Abrahamsson (2019) discuss the notion of social sustainability, a positive indicator when a community or group of people meet sustainable ends. In the context of mining, social sustainability considers "the unique circumstances that communities have in common and the necessity to manage dramatic changes associated with the mining boom and bust or recessions" associated with mine closure (Segerstedt and Abrahamsson (2019, p.3)

In this study, utilising SLA as an analytical lens provides a conceptual and contextual platform to analyse social and economic dimensions of mine closure at Tshikondeni Mine.

2.12 Conclusion

Relevant literature has been explored and reviewed to achieve the study aim of establishing how the former mineworkers at the Tshikondenin Coal mine are sustaining their livelihoods in the context of mine closure. The literature review addressed key thematic areas relevant to the study, precisely the global context of mine closure, coal mine closures, the conceptualisation of the mining community, and the South African context of mine closure.

Discussed also were the social, environmental, and economic ramifications of mine closures. The critical outcome of the literature review pertains to how the conventional research on mine closures suffocated research on social and economic dimensions by putting a heightened emphasis on the environment and ecological aspects. Thus, literature unpacked salient aspects of the extraction industry on society, especially out-migration, crime, social stress, impoverishment, and the plight of unskilled labour who find it hard to join other mines.

CHAPTER THREE
MINE CLOSURE POLICY CONTEXT IN SOUTH AFRICA

3.1 Introduction

The previous chapter discussed the global experiences of mine closure. The environmental impact of mine closure overshadows social and economic mine closure-induced challenges. However, social, and economic challenges associated with mine closure affect adjacent communities and workers. The problem is exacerbated by dependence on mining for livelihoods and a lack of alternative sources of income. This chapter examines the mine closure policy and legislation in South Africa. It provides an overview of various legislative frameworks governing the mine closure processes in South Africa. It provides a broad historical overview of the mining policies and highlights the changes, continuities, and trajectories of the mine closure policy in South Africa. Key policies include the 1956 Mine and Works Act, the Atmospheric Pollution Prevention Act of 1965, the 1967 Mine Rights Act, the 1975 Fanie Botha Accord, the Minerals Act of 1991, the Constitution of the Republic of South Arica, the 1998 White Paper, the Mine Health and Safety Act of 1996, the National Environment Management Act of 1998, the National Water Act of 1998, the Nuclear Energy Act of 1999, Minerals and Petroleum Act of 2002. It also investigated the social, economic, and political factors that

shaped the formulation of various mining policies in South Africa. The 2021 Draft National Mine Closure Strategy is presented as the most recent government initiative towards achieving sustainable mine closure by mitigating the negative impact of mining on communities connected to mining undertakings, and the workers affected by mine closure. The chapter concludes by weighing the gaps and strengths in the mine closure policies.

3.2 Historical mine closure legislation

Mining involves the extraction of precious minerals such as gold, diamond, platinum, and uranium from the earth's crust (CSIR, 2019; Gregory, 2021. There are critical value chain processes involved in mining ranging from the "discovery of minerals, mine development, extraction, processing, beneficiation of the mineral commodities, closure and land rehabilitation" (CSIR, 2019, p.7). However, mine closure takes place when confronted with mineral depletion, financial instability, or natural disasters (Bainton and Holcombe, 2018; Ackerman et al., 2018; Swart, 2003). In some instances, when local social and political conditions interfere with mining activities, companies are forced to abandon mining **(**Marais, 2022; Marais et al., 2020; Vivoda et al., 2019; Bainton and Holcombe, 2018; Ackerman et al., 2018).

The extractive industry in South Africa dates to 1852 when the colonial explorers discovered copper at Springbok in the Northern Cape. The mining industry later expanded after discovering gold and diamond as precious stones in the 1860s (Manesis, 2023; CSIR, 2019; Watson and Olalde, 2019; Minerals Council of South Africa, 2018; Chamber of Mines of South Africa, 2017). Subsequently, mineral commodities such as coal, platinum, iron ore, and chrome are explored and continue to be extracted (Minerals Council of South Africa, 2018).

Since that time, mining has flourished and accounts for the development of mining-driven towns in the country (Swart, 2003). The catalytic role of mining in economic growth and development is significant (Marais, 2023; CSIR, 2019; Mineral Council of South Africa, 2018; Gregory, 2021). The mining industry is revered for its significant contribution to the country in terms of employment creation, economic growth, infrastructure development, and overall revenue generation (Minerals Council of South Africa, 2019; Chamber of Mines of South

Africa, 2017; Marais, et al., 2015; Swart, 2003). The 2018 Mineral Council of South Africa reports that mining accounts for about R312 Billion direct contribution to the country's Gross Domestic Product (GDP), which translates to 6.8 per cent of the country's total export earnings generated by mining (Mineral Council of South Africa, 2018). However, many mines have since closed, with some on the verge of closure due to the infinite nature of mineral resources. South Africa has about 6000 abandoned mines. That warrants an introspection into the legal frameworks governing the extracting industry in the past and present. An essential deduction by Cawood and Minnittt (1998) pertains to the formulation of mining policies in line with the economic and political dynamics of the country. For example, the Land Apportionment Act of 1930 advanced a racial policy to give White explorers the exclusive right to extract precious minerals such as gold and diamond (Cawood and Winnett, 1998). The approach guided the conduct of mining by the Dutch since 1852 and the British since 1806. During the Union era in 1910, the state allowed for private ownership of land, and individuals could apply for mining rights on their land, while the state retained exclusive power over minerals (Cawood and Winnett, 1998).

A massive void in mining activities is the absence of a clear policy that addresses the closure process. This is especially problematic to the social and environmental dimensions of mine closure. The first attempt to deal with mine closure came in the 1950s. The 1956 Mine and Works Act (27 of 1956) is one of the earliest initiatives by the government of the time (Khanyile and Marais, 2024) to focus on the welfare of the mine workers. It obligates mine companies or employers to provide workers with housing, healthcare, education, and safety. The Act further obliged mining companies to fence their mines and consider surface rehabilitation. However, a broader closure framework that covers environmental and socio-economic issues was absent. It also prioritised surface rehabilitation without considering below-surface aspects like tunnel stability (Khanyile and Marais, 2024). The 1965 Atmospheric Pollution Prevention Act (Act 45 of 1965) was promulgated to address mining-related air pollution. The Act aimed to prevent and control dust-induced pollution by mining activities (Swart, 2003). Mining companies had to submit a plan for monitoring and preventing atmospheric pollution (Atmospheric Pollution Act, 1965). The Atmospheric Pollution Prevention Act was a precursor to several pieces of legislation formulated to govern mining and mine closure.

The Mining Rights Act (Act 20 of 1967) was a paradigm shift on closure. The Act required mining companies to secure licenses and submit closure and rehabilitation plans. In the absence of a monitoring and implementation framework, the Act was ineffective. However, the 1975 Fanie Botha Accord reinforced the notion of responsible mining. It emphasised the need for closure, land rehabilitation plans, and the overall negative impact of mining on the environment (CSIR, 2019). The state had to assume responsibility for mines that closed before 1956, while companies would take responsibility for the closure thereof. The lack of enforcement and monitoring mechanisms watered down the value of the Accord (Khanyile and Marais, 2024). The following section discusses the major shifts in the mining policy environment in the post-1990 dispensation.

3.3 Mine closure legislation, 1990 - 1999

Conventional mining policies did not consider socio-economic and closure plans. Most mining companies were profit-oriented and ignored the adverse effects of mining on the environment and communities (Bobbins, 2013). Leaving behind rubble dumps and unrehabilitated land was common (Swart, 2003). Many unprofitable mines were abandoned without instituting any formal closure process (Klopper and Wessels, 2017; Mhlongo and Dacosta, 2016). The CSIR (2019) reported that the permissive legal landscape, and the failure to plan and budget by mining companies and the successive governments in South Africa, demands a significant paradigm shift towards mine closure. The 1990s ushered in a new dispensation and a more nuanced approach to the management, ownership, and regulation of managing, owning, and regulating the mining sector. Cawood (2004) notes that the idea was to formulate inclusive mineral policies to address the legacy of social, economic, and political injustice in South Africa.

The first notable post-1990 initiative towards responsible mining was the promulgation of the Minerals Act of 1991 (Act 50 of 1991). The Act aimed to address the environmental and social consequences of mining and “long-term residual effects on the social, health, environment and well-being of the communities in proximity with the mining” undertakings (Swart, 2003, p.489).

The 1991 Mining Act requires mining companies to submit their environmental management program and rehabilitation plan, make financial provisions, and apply for a closure certificate (Minerals Act, 1991). The Mineral Act was the first policy to remind companies of their environmental liabilities (Mhlongo and Dacosta, 2016). Thus, surface rehabilitation before liquidation and closure had to be prioritised to avoid burdening the government with the negative legacy of mining at closure (Cawood, 2004; Swart, 2003).

The 1996 Constitution of the Republic of South Africa (Act 108 of 1996) changed the mining policy landscape in South Africa. The Act introduced sustainability in all mining practices and regulations. The Constitution made it explicit that the government is the sole regulator of the safety and health of the environment, and sustainable development (Constitution of the Republic of South Africa, 1996). The governing party, the African National Congress (ANC), had long noted that mineral resources are a "national asset" that should benefit the entire nation. The 1995 Mineral Policy Steering Committee recommended the state's control of all the mineral resources (Cawood, 2004; Swart, 2003). Premised on socialist economic principles, the ANC called for mining companies to pay rent to the state, which manages the mines on behalf of the citizens (Cawood, 2004). However, the 1996 Constitution of South Africa (Chapter 2) advocates property rights. Fundamentally, property rights guarantee the security of tenure to investors in the mining sector through issuing of a mining license (Cawood, 2004).

Similarly, Section 24 (4) of the Constitution stipulates the rights of citizens and individuals to an environment that is not harmful to their health and well-being. By implication, mining companies are responsible for any harm to individuals caused by irresponsible mining conduct (Watson and Olaide, 2019; Swart, 2003). Regarding the issuance of closure certificates, companies must comply with the stipulations of the Act and other supportive regulations by the government.

The Mine Health and Safety Act (MHSA) of 1996 (Act 29) is another notable legislative framework meant to bolster the Minerals Act 1991. The Act was promulgated against high fatalities in the mining sector. Sections 2 and 5 of the Act align with the mine closure

regulations by obliging mining companies to ensure a safe and healthy environment at the mine during commissioning, operations, decommissioning, and closure (Bobbins, 2013; MHSA, 1996). It emphasises an integrated water management plan for all mines to protect the nation's aquatic life, ecosystem, and biodiversity by preventing pollution or contamination of water bodies (Swart, 2003). Mining companies must comply with the NWA as part of the broader closure policies. A human-oriented dimension of the Act is the talk about the health and safety of the employees and permission for them to abdicate any dangerous working environment (Swart, 2003). The Act regulates water usage and management by advocating pollution prevention, water reuse, reclamation, treatment, and prevention of groundwater contamination due to mining activities (Bobbins, 2013).

The 1998 National Environmental Management Act (NEMA), Act 107 of 1998 provides a framework for preventing and responding to mining-induced environmental challenges**.** NEMA advocates environmental management as integral to sustainable development (Bobbins, 2013). Section 24 and 28 of the Act talk about the duty to care for the environment, and charge rehabilitation charges to mining companies or individuals who inflict damage on the environment (Mpanza, Adam and Moolia, 2021; NEMA, 1998). The NEMA Act requires the mining rights holder to ensure environmental rehabilitation in alignment with the principles of sustainable development (NEMA, 1999). The Environmental Management Programme (EMP) requires an impact assessment before approval of the closure plan. The mining company must notify the Director of Mineral Development in writing at least 14 days before ceasing operations (NEMA, 1998). It is only after compliance that a closure certificate is granted (Watson and Olalde, 2019; Swart, 2003). The principle "polluter pays" is the backbone of NEMA as it pins the remediation of the environment to any company responsible for environmental damage (Bobbins, 2013, p.11). Mining companies must comply with the NWA as part of the broader closure policies. The major shortcoming of the policy is that notice of closure is still linked to environment and nothing on socio-economic sustainability of communities.

Another significant development in the mining policy context is the White Paper on Mineral and Mining Policy for South Africa (1998). The White Paper acknowledged the reality of mine closure due to increased mechanisation (Ntema, et al., 2017). It further discusses the social

and economic disruptions caused by the mine closure. For example, the White Paper required mining companies to create a fund to mitigate the socioeconomic disruptions caused by mine closure (Ntema et al., 2023). Further stipulations are for the government to mitigate the "social consequences of sizeable downscaling and closure" (DME, 1998, p.48). At the local levels, the local government must use their strategic plans and intergovernmental funding to address the shocks caused by mine closure. Furthermore, the White Paper stipulates that mining companies should re-skill mine workers for alternative employment and livelihood opportunities (Ntema et al., 2023). Mining companies must have a social labour plan. It further provides the parameters for the transparent and efficient regulation of mineral resources (White Paper, 1998). Despite emphasising socio-economic impact of mine closure, the White Paper is guilty of allocating most of the responsibility to local governments who have largely been observed to be ineffective in most local government audits.

The Nuclear Energy Act 1999 (Act 46 of 1999) was formulated to manage the impact of radioactive materials from mines. Specifically, focus was on environmental health and the safety of the communities. It recognises the impact of radioactive elements from minerals such as uranium and chemical leaches or the expiation of pyrites associated with gold mining (Bobbins, 2013; Swart, 2003; NWA, 1999). The Act, therefore, charges that if any mining waste contains radioactive elements, mines must take preventive measures before they are issued a closure certificate.

The following section discusses the post-2000 mine closure policies, highlighting their merits and demerits.

3.4 The Mineral and Petroleum Resource Act (MPRDA)

The establishment of the Department of Mineral Resources (DMR), and the enactment of the Mineral and Petroleum Resource Development Act 28 of 2002 (MPRDA), constitutes a 21st Century milestone development in the regulation of mine closures (Watson and Olalde, 2019; Hermanus, et al., 2015; Swart, 2003). The nationalist agenda of the MPRD charges the DMR with managing all extractive industry activities in the country, including issuing mining licenses. The MPRDA, therefore, echoes the aspirations of the 1998 White Paper on Mineral and Mining

Policy by pronouncing the state as the sole custodian of all mineral and petroleum resources (CSIR, 2019; Hermanus et al., 2015). The Act obligates the mining holders and companies to take full responsibility for the mine and ensure sustainable closure until the Minister of mines issues a closure certificate (CSIR, 2019). Empasis is again on the environmental aspects of mining as it talks about mining companies' responsibility for environmental liability, pollution, or related ecological degradation (Mpanza et al., 2021; Alberts et al., 2017; Klopper and Wessels, 2017).

As a confirmation of policy alignment, Section 37 of the MPRDA resonates with Section 2 of the NEMA articulations on sustainable development. The MPRDA, however, broadens the focus by integrating social, economic, and environmental issues in the pre-and post-closure mining operations (CSIR, 2019; Swart, 2003). Another nuanced dimension of the MPRDA is Section 38, which holds companies or directors of closed mining companies liable for any damage, pollution, or environmental degradation detected post-closure (Swart, 2003). Under Sections 40 and 58 of the MPRDA, various government stakeholders, including the 10 Regional Mineral Development and Environmental Committees (RMDECs), and provincial and local government authorities, should be consulted before a closure certificate is granted (MPRDA, 2002). As part of a cooperative governance system, it is vital to ensure mining companies' compliance with various legislative frameworks governing mine closure. Fundamentally, mine closure planning should be an ongoing process that commences in the early phases of the mining operations (Watson and Olalde, 2019; Swart, 2003). Environmental impact assessment, health and safety requirements compliance, and risk report should be presented before closure is approved. That also includes making financial provisions for rehabilitation by the mining companies (Watson and Olalde, 2019). According to the MPRDA (2002) stipulations, a closure certificate is issued by the Chief Inspector of Mines after the Water and Sanitation and Environmental Affairs departments have confirmed in writing that the closure requirements are met. The approach differs from the Minerals Act of 1991, which only focused on environmental concerns. MPRDA advances the notion of perpetual liability that pins responsibility on mining companies regardless of having secured closure certificates (Alberts et al. 2017). Practically, the MPRDA rescues the state from incurring unnecessary costs in the post-mine closure dispensation.

The MPRDA authored a comprehensive approach to mining that considers the social, economic, and environmental costs, described by Swart (2003, p.492) as a “cradle-to-grave approach to prospecting and mining”. Through MPRDA, the government focuses on ecological sustainability, developing mineral and petroleum resources, and bolstering economic and social development (MPRDA, 2002). Unlike the previous legislations, under the MPRDA, the government brings the dimensions of corporate social responsibility, that is, “the role of mining companies in local rural development and the upliftment of community well-being and livelihoods” (Cawood, 2004, p.58). Thus, Mpanza et al. (2021) argue that the promulgation of the MPRDA is meant to ensure that mining companies take responsibility of community growth and development. The policy gap however is that it holds mines responsible for environmental degradation but is silent in case of lack of socio-economic sustainability.

Another policy development pertains to the 2018 Mining Charter, which discusses broad-based economic empowerment. Section 2 of the charter makes the communities an integral part of mining and calls upon mining companies to balance between mining and the community’s socioeconomic development (Department of Mineral Resources, 2018). It calls upon companies to engage positively with the communities for community development and participation, and avoid exploitation (Mpanza et al., 2021).

The following section discusses recent policy developments in the mining regulation landscape of South Africa.

3.5 The Draft National Mine Closure Strategy

The May 2021 Draft National Mine Closure represents the most recent policy development governing mine closure regulation since the promulgation of the MPRDA in 2002. Kanyile and Marais (2024) claim that the culture of noncompliance with the MPRDA closure demands compelled the government to revisit the mine closure policy. Mining companies allegedly followed the strategy of evasion and flight without following stipulated closure regulations (Kanyile and Marais, 2024). In 2021, about 6100 abandoned mines were reported, demonstrating the need for progress in implementing mine closure regulations (Mhlongo,

2023; Almano, 2022; Human Rights Watch,2022). The government, therefore, crafted the Draft National Mine Closure to address the challenges of mine closures. The Draft advances both socio-economic and environmental aspects of mine closure. It articulates sustainable mine closure and mitigating the negative impact of mining on communities connected to mining undertakings (DMRE, 2021; Matikinca, 2021).

The collaborative approach of the draft obligates mining companies and the government to collectively address social and environmental aspects of mine closure for sustainable closure. That involves instituting sound monitoring and evaluation frameworks throughout the life cycle of mining (DMRE, 2021). To mitigate livelihood disruptions after closure, the Draft Mine Closure document proposes developing parallel economies in and around mining cities (Matikinca, 2021). Fundamentally, the government, through the DMRE, spells out an integrated and sustainable closure framework for the post-closure sustainable ecosystem, efficient water management and use, and post-closure water use (DMRE, 2021). An incisive deduction by Kanyile and Marais (2024) is that the Draft National Mine Closure Regulation rationalises environmental management processes, social labour plans, and corporate social responsibility. Ntema et al. (2023) posit that the comprehensive approach of the draft makes environmental rehabilitation and socio-economic aspects of mine closure inseparable. That makes the Draft National Mine Closure a nuanced framework as it endeavours to address the gaps in previous mine closure policies, by balancing between environmental issues and social aspects of mine closure.

3. 6 Criticism of the mine closure regulations

The above-profiled mining policies and regulations show the government's commitment to international best practices regulating mine closures. The aim is to align with sustainable development ends and avoid compromising the ecosystem and community well-being. Despite these sound legal frameworks governing mine closure, achieving sustainable mine closure remains highly elusive. Numerous evidence of abandoned mines and dumps and unscheduled, sudden, and premature mine closures are testament to the challenge of ensuring best practices on mine closure (Matikinca, 2021; Mpanza et al., 2021; Watson and Olalade, 2019). The Mine Alert, cited by Matikinca (2021), reported that almost R30 billion rands was

needed to rehabilitate thousands of abandoned mines nationwide. The cases of Sifiso Yende (14 years old) and Xolani Mtembu (17 years old), who tragically drowned in one of the abandoned mines in Msukaligwa Local Municipality in Mpumalanga, are a testament to poor implementation of closure and rehabilitation policies (Mhlongo, 2023; Almano, 2022; Human Rights Watch,2022). These developments allegedly leave some mining communities with premature mine closure-induced social, economic, and environmental burdens.

While blending social, economic, and environmental aspects of the 2021 Draft National Mine Closure Strategy is commendable, the Draft has several loopholes. There is a general assumption that mining companies can prioritise economic diversification or alternative economies after closure (Ntema et al., 2023). The assumption exposes a shallow comprehension of the social aspects of mine closure. There is also an assumption that all the mining towns can steer economic diversification. Ntema et al. (2023) advise the need to properly comprehend the social and economic space in towns where mining takes place. Thus, insights from the economic geography by Boshma and Frenken (2018), regarding the importance of space and time, should be factored into the matrix of economic diversification. Ntema et al. (2023) further note that economic diversification is more of a process than an event and is not easily accomplished in peripheral mining areas.

The 1998 White Paper on Mineral and Mining Policy is another document marred by gaps. Despite portraying a deeper reference to the social and economic realities of mine closure, it is castigated for being too utopian in orientation and practice (Ntema et al., 2023). It suffers from denialism and fails to acknowledge the poor and weak capacity of local government in South Africa. Therefore, relegating all closure challenges to the local government is quite problematic (Ntema et al., 2023). Again, the assumption that mining companies will create a social fund to mitigate post-closure challenges demonstrates wishful thinking. The policy can be realisable with enforcement mechanisms for compliance (Ntema et al., 2023; Mhlongo, 2023; Almano,2022).

Similarly, the aspirations of the 2018 Mining Charter are neutralised by the 2008 Companies Act, which stipulates that companies can plough back to the community based on their liquidity

status and solvency (Mpanza et al., 2021). As a result, companies may deliberately evade their social responsibilities. The Mining Charter is criticised for needing more clarity and timelines for mining companies to contribute to social development projects. That explains why some companies find it easy to evade their social obligations.

Mpanza et al., (2021) say that botched mine closure cause trauma and frustration among the mining communities due to job losses and disruption of livelihoods. Often, consultations with the communities afflicted by mine closure challenges are said to be premised on a tick-box approach that does not go deep into the impact on their livelihoods (CSIR, 2019). Sudden and premature mine closures give some companies a soft landing as they evade incurring closure costs. The South African government is confronted with the persistent challenge of illegal miners (*Zamazama*s in the local parlance), which exposes some fractures in the mine closure policies and practices.

Alberts et al. (2017) question why so many departments should be involved in the mine closure process. The views are shared by van Druten and Bekker (2017) and the Corruption Watch (2017), who lament the shortage of staff with relevant skills and knowledge and the appointment of unqualified personnel within the regulator board as the cause of mining failures. Similarly, the Corruption Watch (2017) and CSIR (2019) allege that applicants pay bribes to the DMRE officials to secure operation and closure permits. Watson and Olalde (2019) are concerned about deliberate delays and reluctance by the government to issue closure certificates due to fears of inheriting the costs of premature closures.

Policy contradictions and disharmony also complicate successful mine closure. For example, Humby (2015) cites the contradictions between winding up procedures and the rules governing the transfer of mining rights, and the confusion surrounding financial provisions and final closure. These allegedly have a direct bearing on both the communities and environmental rehabilitation. The challenge of corporate distress causing cash flow limitations by several mining companies also compromises the efficient implementation of mine closure (Mpanza et al., 2021). Experiences from gold mining companies such as Pamozi Gold, Lily Mine, and Aurora Mine are test cases of corporate distress. The World Bank (2002) alludes that the fall

of commodity prices and the rise in the cost of production contribute to corporate distress in most extractive companies and may result in premature closures.

Mpanza et al. (2021) further note that some companies that experience a drop in revenue usually choose the liquidation route, resulting in sudden closures. As a result, the strain is transferred to the government, which has to deal with the challenge of abandoned mines. That explains why the government enforces the liquidation of most mining companies that show signs of being insolvent. In most instances, distressed companies are assisted to avoid instant liquidation; hence, the implementation of the winding-up process. The major limitation of the winding-up approach is that companies may evade the closure process and end up closing without a certificate (Mpanza et al., 2021).

Another policy gap that Humby (2015) observed pertains to the absence of an official standard measure for quantifying the social costs of mine closure. Despite a social and labour plan in the MPRDA, the policy provides very little protection to the community and mine workers in situations where the company faces liquidation. Milaras (2015, p. 32) notes that, from a needs analysis perspective, mine owners always want minimal liability. However, the government wants to avoid incurring financial and social costs. As a result, communities afflicted by botched mine closures are on the receiving end as they strive to sustain their livelihoods after mine closure (Siyongwana and Shabalala, 2019).

3. 7 Conclusion

The chapter addressed various policies and regulations governing mining closure in South Africa. A substantial deduction from the chapter pertains to several policies promulgated and implemented since the dawn of democracy in South Africa. The chapter argued that conventional mine closure policies need a more humanistic approach since they primarily focused on environmental issues. The chapter demonstrated that the promulgation of the MPRDA marked a paradigm shift in the discourse and practice of mine closure by aligning socioeconomic and environmental aspects. Successive policies focus on social labour, economic and sustainable post-mine closure communities. Fundamentally, the 2021 Draft National Mine Closure Strategy brings a nuanced dimension of integrated mine closure

strategy that involves post-closure economic diversification, but still seems to be more idealistic than practical. A significant challenge discussed in the chapter pertains to the sustainability and effectiveness of the mine closure policies compounded by the need for more enforcement, ambiguities, and community approaches. While companies are being efficient in doing what businesses do which is making profits, governments and local governments have failed to represent the people in enacting and enforcing the right policies. The overseeing function of the state has failed to hold these businesses accountable hence resulting in compromised livelihoods for communities. An overemphasis on environmental sustainability and less on socio-economic sustainability again illustrates policy failure. There is also a significant amount of gap from policy enactment, implementation, and enforcement. That reveals a fair amount of lack of synergy and consistency in the way policies are enacted.

Despite sound policies, the chapter concludes that companies push for profit maximisation and transfer the burden of closure to the government. Evidence of botched and premature mine closures, abandoned mines, and flourishing illegal mining activities show that the South African government still has a long way to go regarding sustainable mine closure.

CHAPTER FOUR
PRESENTATION AND ANALYSIS OF THE STUDY FINDINGS

4.1 Introduction

Chapter 3 discussed the mine closure policy landscape in South Africa. The evolution and development of mine closure policy was discussed in line with the development of the extractive industry since the colonial period. Mining policy formulation passed through several phases ranging from the colonial, apartheid and post-apartheid political environments that led to more people-focused closure policies. The Draft National Mine Closure Strategy of 2021 is the most recent 21st-century policy development in South Africa, that highlights both social and economic dimensions of mine closure.

This chapter, therefore, presents and analyses the findings from in-depth interviews with the former mineworkers at Tshikondeni mine. As mentioned in Chapter 1, this study examines how the former mineworkers at Tshikondeni in the Limpopo Province managed to sustain their livelihoods after losing their jobs due to mine closure. I documented the narratives of former mineworkers about how they survived after losing their jobs. The study is based on narrative interviews with 12 mineworkers selected through snowball sampling. The phenomenological approach adopted in this study utilised in-depth interviews for data collection and allowed for

close interaction with the participants in their natural settings. The study participants were drawn from local villages around the Tshikondeni mine (see Table 1 showing the demographics of the study participants).

Table 2: Themes and Sub-Themes

RESEARCH QUESTIONS	Main Theme	Sub-Themes
Tell us a story about being employed at a mine.	**Pre-Mine Closure**	• Demographics • Getting a Job at the mine • Occupation at the mine • Duration of employment
Tell us your story about life after losing your job at the mine.	**Post-Mine Closure**	• Preparedness • Life after job loss/Impact of Job Loss • Prospects for New Employment after Job Loss • Alternative Source of Livelihoods

4.2 Theme 1: The story of being employed at the mine.

This section discusses and analyses narratives by the former mineworkers on how they got employed at the Tshikondeni mine. Table 1 shows that the participants' employment ranged from 7 to 32 years. Unskilled workers had more years of service than skilled workers. Furthermore, old respondents were previously employed in unskilled mining areas, while the younger generation had skills and did professional mining work.

Three categories emerged regarding how people were employed at the mine, ranging from the interview process, referral by friends or relatives and paying a bribe to the foreman.

4.2.1 Employment through the interview process

Most unskilled mineworkers said they queued for employment at the company gate early in the morning and were hand-picked. They were then asked to perform a manual test using a pick and shovel to prove their ability to work. These unskilled workers had to show their fitness to perform manual labour. This was captured in the words of respondent 4:

> "*Back then, there were no interviews in 1983, and you would just get employed, then they would give you a pick and shovel. They would tell you where you are digging from and where to end to prove your physical strength".*

The quote confirms the masculine nature of mining work and that it had been a significant requirement for employment. This meant that skill levels of many mineworkers were low and women were denied access. This also had consequences for mine closure – mainly if no new skills were acquired during employment. The lack of new skills makes employment in sectors other than mining very difficult.

The second interview method involved a formal technical interview process for skilled workers. Skilled workers include machine operators, drivers, welders, and boiler makers. The skilled workers were employed through a standard job application process in response to company advertisements. They underwent a face-to-face interview and were taken to the factories or sites of work to prove their skills and knowledge. Drivers had to undergo road testing to demonstrate their ability to work in the transportation sector.

4.2.1 Getting employment through bribery.

A few former mineworkers reported getting employed through bribery. With no internal connections or skills, they were compelled to pay monetary bribes to secure employment in the mine. The bribe was being paid to the foreman recruiting manual workers. Respondent 3 said,

I paid a bribe (Jojo) to get employment at the mine because I had no skills and knew nobody there".

The above quote shows how the employment system at the mine was prone to abuse and how desperation for jobs forced some mineworkers to pay bribes to get employment at the mine.

4.2.3 Getting employment through referrals.

Some former mineworkers benefitted from their connections and relatives already employed at the mine. These informed them about recruitment processes. They found it easy because they did not have to queue at the company gate or pay bribes if they lacked qualifications.

4.3 Theme 2: Life experience after a job loss to mine closure

This section addresses phase 2 of the study objectives regarding life mine closure. Various themes relate to their preparedness for closure and life after closure, the impact of the mine closure on their livelihoods, their experiences of job hunting after closure and their alternative sources of livelihood.

4.3.1 Mineworkers' and preparedness for mine closure

The researcher wanted to understand the mineworkers' preparedness and awareness of mine closure. Findings show that preparedness has two main elements: being notified or informed about the imminent closure and personal readiness for closure. Most study participants confirmed that the mine management informed them beforehand. The depletion of underground coal and the declining demand for coal were cited as the primary reasons. Moreover, four months before the final closure, the mine again informed employees that it was officially ceasing operations. Respondent two said,

"*We were always told that the mine might be closed anytime because coal is getting finished, and other mines are competing with our mine".*

Despite the evidence of being informed about the inevitable mine closure, the findings revealed

that most of the mine workers were not ready to face the reality. The following statement from Respondent 5 provides evidence:

> *"When sometimes things are just spoken, we take them for granted, but after they happen or when the company says, 'tools down,' you can see how serious things are, but when things are still being said, you just think they just do not want to pay their workers."*

Respondent 9 concurs with Respondent 5 on the preparedness problem despite being informed about the mine closure. Respondent 9 said,

> *"You can never prepare for bad things while everything is going well. It is the same as we were being told whether you like it or not, that is how it will be".*

The above evidence shows that mine workers were still in denial and could not take it seriously that the Tshikondeni mine would close. The fact that people were told verbally might have contributed to elements of relaxation and denialism. None of the mineworkers confirmed receiving the notice of mine closure in writing, which might also have contributed to relaxation and denial. That may explain allegations of abrupt mine closure made by Respondent 6:

“I did not know that the mine was closing. It was abrupt, and I was unprepared”.

Another aspect that emerged from the findings regarding preparedness was the issue of income savings. Most of the mineworkers indicated that there was no way they would be ready for the job loss because of their low salaries. Despite not soliciting information about their exact earnings, in terms of the actual amount (because of the confidentiality of salary issues), evidence showed that the low salaries earned by many general workers inhibited them from financially planning for mine closure. For example, Respondent 9 mentioned:

> *"Being a general hand, my salary did not allow me to make any savings, so there was*

no way I would be prepared for job loss even though we were told".

From the above statement, low salary earnings emerged as another factor inhibiting the former mineworkers' preparedness for mine closure. Although the mine closure message might have been communicated, some mineworkers were not ready to face the situation of mine closure because they were financially disadvantaged.

There is also an interesting contradiction between skilled and unskilled mineworkers regarding their preparedness for mine closure. Skilled mineworkers were generally prepared for mine closure. Most skilled mineworkers took the closure message seriously and had several options. One such option was to increase their savings. Respondent 11 said:

"I was generally prepared and had even increased my savings to ensure that I would not struggle after mine closure".

In addition to those with savings, those with higher qualifications and skills often applied for alternative jobs. Respondent 5 said he "*started to apply for other jobs after being notified of the looming mine closure".* Another skilled respondent (Respondent 12) echoed the same sentiments when he said:

"I was prepared. It was more of a blessing in disguise because it allowed me to pursue my dream of having my own business".

Skilled mineworkers were relatively financially stable. They were prepared to face mine closure, and some were quickly absorbed by other mining companies scouting for skilled workers like machine operators, shaft timbermen, boiler makers and engineers.

4.4 Life experiences after mine closure

Understanding the mineworkers' experiences after the closure was core to the study. Mineworkers and their families had varied experiences of mine closure and livelihood disruption. The social impact of mine closure, especially for unskilled workers, ranged from

inadequate pension payout, failure to pay children's school fees and marital and stress-related problems. The skilled workers managed mine closure as they quickly secured new employment.

Findings show that many unskilled mineworkers depended entirely on minework to sustain their livelihoods. The negative impact of mine closure is discussed in detail in the following sections:

4.4.1 Inadequate pension payout

When a mine closes, the general expectation is that pension payouts should enable workers to live decent lives. Most unskilled participants struggled with lifestyle downgrades for themselves and their families. Pension payouts were inadequate to cater to their daily needs. Respondent 2 said,

> "*The consequences are many. You can see that while you are used to that month end you get paid, and at the month end you do not get paid, it becomes a problem because you have to use what the mine gave you; it means life has changed even the way you are used to eating changes. Everything you used to do; you now have to limit them checking your budget because you do not know how your life span will be".*

The above quote reveals some of the salient aspects of the social and economic consequences of mine closure. The erosion of income subjected people to untold suffering and impoverishment. From the quote, the ordeal of job loss compelled most of the mineworkers to accept reality and downgrade their living standards. With no other source of income, people had to adjust and cut their daily spending to align with the available resources. The quote further shows that post-mine closure challenges cannot be understated because families are affected financially and struggle to keep up with their lifestyles. There is also an element of anxiety and living in fear, especially when the reference was the mode of the uncertain future under such constrained budgets. Respondent 7 expressed similar sentiments:

> *"During that period, things were hard because I had no money to buy food; however,*

we could only survive through my mother's grant because she was the one buying my family and me some food and soap."

The late payment of pension money (which only came after eight months and was very little) worsened the situation for her and the children to the extent of being reduced to dependents surviving on her mother's old age social grant. Ideally, the inverse should be the case for her to provide for the mother and the children. Her reflections on the need to buy food and soap reflect two basic needs: the need for food and to be clean.

4.4.2 Marital problems

Most of the interviewed mineworkers explained the drastic change in their lives. One former mineworker reported being dumped by their wife and kids because he was no longer able to provide for the family. Respondent explains:

"Life became tough. The consequences of my no longer working are that I lost my family, and now I am staying alone. "I was the breadwinner; my family struggled after I lost my job with an insignificant pension".

The quote provides evidence of the fracturing of marriages and families due to the inability to execute fatherly duties. Generally, most African societies are patriarchal, and men are expected to provide for the family. Failure to live up to that expectation brings shame and negative labels. From the above quote, therefore, the experience of losing a job is characterised by loneliness, despair, and failure as a man (insignificant person).

4.4.3 Psychological effects of mine closure on mineworkers

The results point to the stress induced by job losses after mine closure. Some of the mine workers related their struggle to come to terms with the reality of being jobless after the closure of the mine. Respondent 7 said,

"After I lost my job, it took me some time to accept that I was no longer working, and by that time, one of my children was in grade 12. During that period, things were hard because I had no money to buy food".

The inability to provide for the family to the extent of failing to pay school fees and putting food on the table led to stressful life experiences following job loss to mine closure. Similarly, the stressful experiences can be discussed considering the marriage breakdown as a result of failure to provide for the family and the inadequacy of pension payout, which led to lifestyle downgrade, as discussed above. Respondent 6 decried:

“The consequences of me no longer working are that I lost my family. My wife left me, and now I’m staying alone”.

4.4.4 Mine closure experiences of the skilled workers

Study findings showed variations between skilled and unskilled workers in exploring the life experience after the mine closure. The preceding section revealed how the general workers struggled because of a lack of skills and the inability to secure other jobs. Regarding those with skills, it emerged that although they experienced some shocks, the impact of mine closure was insignificant. This is attested to by Respondent 12, who was employed as a welder at the mine:

"Yes, I was slightly shaken since there was no monthly income, but I have been able to sustain my family from the welding proceeds".

The respondents above found some soft landing since they use their skills for self-help projects, unlike unskilled workers with no savings and skills.

Findings further show that some skilled workers did not struggle because other mining companies quickly absorbed them, Respondent 11 confirmed:

"I got absorbed by another mine and did not struggle at all."

These dynamics show that mine closure affects mineworkers differently, and examining mine closure's social and economic dimensions should not be generalised.

4.5 Prospects for employability after mine closure

Findings showed that the experience of securing another employment for the study participants depended on skill or qualifications, age and the location of the mine.

4.5.1 The Role of skills and qualifications in securing another job

Evidence from the study findings showed that skill and having qualifications guaranteed securing another employment post-mine closure. Most of the former mineworkers who were unskilled and had no qualifications struggled with securing employment. Evidence shows that a few individuals who secured other jobs had to settle for less, if not downgrading from their previous occupation. One secured employment at a local guest house as a cook, while the other secured a job under the Expanded Public Works Programme (EWP). Respondent 2, who obtained employment at the EWP, said,

> *"Life was difficult, and I was lucky that I got a 2-year contract in road works (fixing roads) with the help of a friend".*

The EWP is a government programme meant to assist the unemployed and poor people in earning a stipend after completing specific tasks like cleaning and roadworks. This was, however, a downgrade from a salaried job since the government only paid a stipend. Further evidence of downgrade was when Respondent 7 was downgraded from being a company cleaner to a household helper, where she earned far less than she used to get. The respondent framed it as follows:

> "*Things were hard because I had no money to buy food and had no significant pension. I had to settle for a new job as a household helper to support my family".*

The above quote reveals the profound social and economic costs of mine closure, especially for people with no skills who struggle to make ends meet. The above quote reveals elements

of desperation when people settle for less because they must feed their families. As mentioned earlier, with no meaningful pension earnings or any other source of income, the imperative to provide for the family pushed people to the extremes of taking whatever job came their way.

On the contrary, people with skills had a different story to recite as they did not struggle much to get new employment. Respondent 5 revealed that:

> *"Yeah, I easily got employed because companies were coming to Exxaro-Tshikondeni, looking for different underground machine operators. I only did a competent test and got hired".*

Similarly, Respondent 11 gave claims of a soft landing after losing his job:

> *"I never stayed at home, got employed easily, and it felt like a transfer".*

From the two quotations, mine closure affected the Tshikondeni mineworkers varyingly. The social and economic aspects of my closure cannot be generalised. People with essential skills had better options at their disposal compared to the less skilled. For skilled workers, there was an element of continuity in their everyday lives. The mine closure did not disrupt their sources of income. The fact that they easily secured other jobs means they overcame the economic and social shocks of closure.

4.5.2 The age factor in securing another job

Age emerged as determining whether one could look for alternative work after closure or just retire at home. Considering that most former mineworkers who were less skilled had no sufficient pension servings, there was an imperative to look for employment to secure income. Contrary to the preceding view, those advanced in age found themselves on the margins of employment. The following quotes reflect this situation:

> *"My job was driving the bus for mine workers. I was 58 years old then, and no company was willing to hire me because I was old"* (Respondent 6).

"After losing my job, I did not apply for another job because it would not be easy to find another job as I was old" (Respondent 1).

In like manner, Respondent 10 decried the age factor:

"With only one year left to retirement, who would hire an old woman, worse still, with no skills?".

Findings show that the older one gets, the less likely one is to secure another employment in the context of mine closure. As revealed by Respondent 6, despite having driving experience, at 58 years of age, the chances of getting hired were very slim. Similarly, Respondent 1 above revealed how old age worked against finding another job. The respondent felt defeated for not bothering to look for another job. In all these cases, there is an element of hopelessness since people felt defeated to look for another job because of the age limitations.

The findings show that the closure of the Tshikondeni mine rendered the less skilled people and the old age vulnerable to mine closure-induced socioeconomic challenges. These two categories of mineworkers suffered a dual blow of being unable to because one is too old or lacks skills.

4.5.3 The location of Tshikondeni mine

The place or location of the mine in the remote and peripheral areas of the Limpopo province emerged as a significant barrier to securing further employment. Despite the willingness and capacity to do low-skilled work, few jobs were available in the rural areas. Respondent 9 said she had to settle for a domestic worker job because of a lack of opportunities for unskilled people. She specifically said,

"It was not easy because I live in a rural area; there are no malls around where you can say I want to find something in the meantime".

From the above, rurality as a contributing factor to the plight of mineworkers emerged. Coupled with less infrastructure development, it implies that job opportunities are scarce.

4.6 Alternative sources of livelihoods

Another crucial aspect of the Tshikondeni workers' mining closure experiences was that they established alternative sources of livelihood. Considering that most of the mineworkers depended on mining income, one would wonder how they coped with life without a salary. The evidence thus far showed variations in life after mine closure between the skilled and less skilled workers. Findings further show that most mine workers were compelled to explore alternative livelihoods. Farming, pension payout, government grants and entrepreneurship or self-employment emerged as the primary alternative sources.

4.6.1 Farming as an alternative source of livelihood

Farming emerged as the main alternative livelihood source most unskilled and old-age mine workers adopted. Being in rural areas where land is available, most respondents reported resorting to subsistence farming. Respondents 2 and 4 revealed how they managed to generate income by selling farming produce:

> "Despite *receiving the monthly social grants, I do a bit of farming cultivating peri, okra and vegetables. Some days you get R2000 and some R5000 depending on your sales".*

> "*I love farming and planting tomatoes, vegetables, green beans and sweet potatoes. This helps with food for the family since I sell these to markets at Thohoyandou and other villages".*

However, former mineworkers who wanted to farm had limited resource constraints. Respondent 3 narrated that;

> *"I do have land to farm on, but if I had an engine, I would farm and take my produce to the shops like others. However, Exxaro promised us a dam for agricultural purposes after the mine closed, but nothing happened."*

From the above quotation, if farming was to be supported through infrastructure and implements, it had the potential to sustain lives. Considering the availability of land, the Exxaro company that owned the Tshikondeni Mine missed the opportunity to transform the lives of the mineworkers through agriculture as an alternative source of livelihood. Farming had the potential to supplement pension earnings through selling fresh produce.

4. 6.2 The government's grants as an alternative source of income.

The sound social security system of old-age grants emerged as another source of income for those advanced in age who could not join the formal employment sector. Coupled with pension payouts, most of the old age alluded grants as their primary source of income. Often, respondents said, "*"I live on little pension payout and a government grant for old age"* (Respondent 4), and that it "is better than nothing (Respondent 2).

The above quotes reveal that since older people can no longer work, the old age grants provide a safety net. In the absence of income, the above quotes show deep dependence on social grants as an alternative source of income by most of the former mineworkers. The deduction from the social grant dimension is that it is a social security measure that sustains lives, especially in contexts of mine closure. Although not equivalent to a salary, at least people have a social safety net.

4.6.3 Self-employment as an alternative source of livelihood

Findings further show how people responded to job loss by venturing into self-employment or entrepreneurship to sustain their lives. Considering the lack of alternative sources of employment in the villages around the Tshikondeni mine, some of the mineworkers used their various skills as alternative measures to provide for their families. Respondent 12 revealed using his welding skills to venture into entrepreneurship.

> *"I am now self-employed because I opened my welding shop. What I get is better for supporting my family".*

Despite being an isolated example, the experience of Respondent 12 conveys the importance of entrepreneurship as an alternative pathway to sustaining livelihoods in situations of mine closure.

Findings further show that self-employment transcends gender boundaries since female participants started baking cakes, scones and fat cakes and selling them to school learners as another alternative source of income. Respondent 9 said:

> *"To survive with my family, I started baking scones, which I sell to the learners at the school gate".*

Similarly, Respondent 1 narrated:

> *"I used to bake scones and make hot dogs for the underground workers at the mine. Now I do the same, baking scones, pizza, and fat cakes, which I sell to school learners".*

Despite lacking professional skills, these female participants proved to be capable of sustaining their lives by using their baking skills. These activities have fewer environmental repercussions than cutting trees and selling them as firewood.

Findings further show that some mineworkers complement the government grant and their insignificant pensions with subsistence undertakings like selling firewood and doing piece jobs. Respondent 6 said that:

> "*To be honest with you, right now, I survive cutting wood from the forest if a customer comes. I also do fence installation to earn some income for a living".*

The above quote shows desperate survival measures when people lose their jobs as they resort to cutting and selling firewood. That has severe environmental repercussions, especially the depletion of vegetation, which leads to soil erosion, desertification, and loss of habitat for

wild animals.

4.7 CONCLUSION

As demonstrated in Chapter 2, the fact that minerals are finite and, at one point, mines will close, is a reality, and the Tshikondeni mine was no exception. All the study participants reported that the mine was forced to close because it had reached its life cycle as coal was depleted. A critical finding of the study is that unregulated mine closures are also a common phenomenon, accounting for several social and economic ramifications of mine closures. Despite the evidence that mineworkers were verbally informed of the looming mine closure, the failure to involve the mine workers in the closure planning, renders Tshikondeni a typical case of botched and unregulated mine closure. A sustainable mine closure could have considered social and economic aspects, especially the well-being of the mine workers after closure. Again, as demonstrated in Chapter 3, the negative social and economic consequences of mine closure are due to the government's poor enforcement of mine closure policies and the non-adherence to mine closure policies by most mining companies. The same can be said of the adverse effects of mine closure on the unskilled mineworkers presented in this chapter. Based on the personal narratives of the 12 participants from the four villages around Tshikondeni, the unskilled mineworkers' livelihoods were severely disrupted compared to a few who had skills and were quickly absorbed by other mining companies. The severe suffering of the unskilled mineworkers post-closure illustrates that the Ministry of Mines and Energy and the local government authority partially monitored the closure process. An integrated mine closure framework failed to balance environmental requirements and socio-economic aspects in issuing the closure certificate. From the findings, it emerged that people who needed more skills were unprepared for the mine closure and struggled to find alternative jobs to sustain their livelihoods. Government grants and subsistence farming emerged as the primary source of livelihood, while the skilled had an option of changing jobs or venturing into entrepreneurship.

The next chapter provides a summative evaluation of the study, conclusion, and recommendations for further research.

CHAPTER FIVE
CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The previous chapter presented key findings on the mine closure experiences of the mineworkers at the Tshikondeni mine. This chapter summarises the key findings of the study on how the former mine workers sustained their livelihoods following the closure of the mine. The study sought narratives on the lived realities of former mineworkers about how they managed to survive after losing their jobs. Fundamentally, the study questioned how the former mineworkers managed their social and economic realities occasioned by the mine closure.

5.2 An overview of the study chapters

Chapter 1 detailed the study aim and problem to be examined. Critical study objectives and research questions were provided. Chapter 2 provided a literature overview. Key thematic areas of focus were the conceptualisation of mine closure, global experiences of mine closures, analysis of the mining community concept, the mine closure context in South Africa, and economic costs of mine closure. The literature acknowledged the catalytic role of mining in economic growth and development (Minerals Council of South Africa, 2019; Velgar, 2019;

Bainton and Holkombe, 2018; World Bank, 2002). Mine closure is a global phenomenon caused by the finite nature of minerals and by several factors like natural disasters, social and economic challenges, and the demand for smart energy solutions (Cloete and Marais, 2021; Strambo et al., 2019; Owen and Kemp, 2018; Van Heerden, 2016). Another salient aspect of mine closure revealed by literature was the conventional exclusive focus on the physical aspects of the environment when the mine closed, and how that eclipsed the social and economic ramifications of mining closure on mineworkers and their communities (Cloete and Marais, 2021; Marais, 2020; by Vivoda, Kemp & Owen, 2019).

Chapter 3 investigated the mine-closure legislative context in South Africa. A broad historical analysis described the changes, continuities, and trajectories of the country's mine closure policy landscape. Most policies pre-1990 were fixated on the environmental aspects of mining. Conventional mining practices and policies were profit-oriented and did not consider socio-economic and closure plans (CSIR, 2019; Klopper and Wessels, 2017; Bobbins, 2013; Swart, 2003; Cawood and MinnItt, 1998). It highlighted mine closure policy gaps leading to irresponsible mining closures. The chapter highlighted significant policy shifts in the post-1990s, galvanised by the Minerals Act of 1991 and the promulgation of South Africa's 1996 constitution. Section 24 (4) places the responsibility for any harm to individuals caused by irresponsible mining conduct on mining companies. It advocates sustainable mining practices that balance the environmental aspects of mining and the well-being of communities and workers.

Some significant mine closure policy developments included obligating mining companies to care for, and rehabilitate the environment. Issuing a mine closure certificate was another significant policy development meant to curb unregulated mine closures (Cawood, 2004). Despite these sound policy developments, the chapter highlighted the need for people-oriented mine closure policies, overemphasis on the environment, and non-compliance and perpetuation of botched mine closures, evidenced by numerous abandoned mines nationwide. The 2021 Draft Mine Closure Policy, however, emerged as the most recent policy initiative that integrates the social, economic, and environmental impact of mining (DMRE, 2021). Another

deduction is that, by the year 2023, there is only a draft policy from 2021. This could suggest lack of an efficient policy environment itself.

Chapter 4 of this study adopted a thematic approach to the presentation and analysis of significant findings from the in-depth interviews with the 12 former mine workers at Tshikondeni mine. As mentioned earlier, the study allowed the mineworkers to narrate their lived experiences of mine closure and how they managed to sustain their livelihoods after mine closure.

Below is a thematic discussion of the study's significant findings. Five major themes that emerged from the findings are: the story of being employed at Tshikondeni mine, preparedness for mine closure, life after mine closure, prospects for employability after the mine closure, and alternative sources of livelihood after losing a job to mine closure.

5.3 Main findings

5.3.1 Lack of compliance and enforcement of mine closure legislation for sustainable mine closure practices

The main finding of the study was that the social and economic plight of the former mineworkers at Tshikondeni was caused by the lack of appropriate legislation that prioritised social and economic aspects of mine closure. At the time of the mine closure at Tshikondeni, policies focused on the environment and the physical aspects of mining. Such policies include the 1998 White Paper, the Mine Health and Safety Act of 1996, the National Environment Management Act of 1998, the National Water Act of 1998, the Nuclear Energy Act of 1999, and the Minerals and Petroleum Act of 2002. Despite referring to some social and economic aspects of mine closure, there was no such enforcement. The experience of social and economic challenges and reports of downgrading the standards of living by most unskilled mineworkers indicate closure failure by the Tshikondeni mine. The mineworkers struggled to withstand the economic shocks emanating from the closure because the closure framework lacked a human-centred approach. The finding about the lack of adherence to, and enforcement of, mine closure legislation resonates with the literature**.** Scholars castigate the 1998 White Paper on Mineral and Mining Policy and the MPRDA, for example, for lacking depth on the social and economic realities of mine closures (Ntema et al., 2023; Almon, 2022).

Existing mine closure legislations are lamented for their shallow comprehension of the social aspects of mine closure. Humby (2015) questions the lack of an official standard measure for quantifying the social costs of mine closure. As a result, there is no meaningful protection for mineworkers in the mine closure contexts.

5.3.2 Failure to cope with social and economic realities of mine closure

The study investigated the consequences of mine closure on individual mineworkers and their families. The focus was on understanding the social and economic aspects of mine closure. Overall, unskilled mineworkers' experiences of the mine closure revealed a lack of preparedness for social and economic shocks of mine closure**.** The fact that mineworkers had entirely depended on mining jobs for their living meant that losing their jobs disrupted their livelihoods. Despite receiving several verbal notices about the looming mine closure, most unskilled mineworkers confirmed their unpreparedness for the reality of mine closure. Findings showed that low salaries inhibited them from financially planning and preparing for life after closure. The disjuncture between being informed or aware of the closure and being prepared for the outcome of the closure was manifest. The narratives of mineworkers revealed an element of hopelessness and lack of choice. Essentially, it was a situation of taking it or leaving it.

Findings showed that the pension payout for all unskilled workers needed to be improved for them to maintain their usual lifestyles. Most were compelled to downgrade their living standards to suit their available resources. These findings concur with Vivoda, et al., (2019), who argue that mine closure has social and economic ramifications since people's lives are directly affected. Furthermore, the experience of financial struggle after mine closure supports postulations by Everingham and Mackenzie (2019) that diminished household income negatively affects living standards at the household level.

Some mineworkers' inability to provide for their families after losing their jobs caused fragmentation of relations as they experienced rejection by wives and children. Sesele et al. (2021) concur that, as men fail to provide for their families in post-mine closure life experiences, some women end up deserting them. Study findings further revealed the

increased stress experienced because of the mine closure. As breadwinners, failure to provide for the family, like the inability to pay school fees for the children, exacerbates stress. Some mineworkers struggled to accept the reality of job loss, leading to job loss pressure. These findings align with Rixen and Blangy (2016) and Ntema et al. (2023), who opine that mineworkers face post-closure stress when destabilising their livelihoods. A study by Rhee et al., (2018) also reported the mental health challenges due to depression caused by economic stress after the closure of the Tulawaka mine in Tanzania in 2005.

Similarly, March (2018) revealed how economic vulnerability following mine closure led to stressful lives in Papua New Guinea. It can be argued that the experiences of Tanzania and Papua New Guinea testify to the social and economic struggles mineworkers face following closure. McKenzie (2020) asserts that less skilled mineworkers cannot stand the shocks caused by mine closure. The consensus, therefore, is that mine closures inflict lasting damage on the communities as they struggle with adjusting to the social and economic dislocations (Vivoda et al., 2019; March, 2017). The finding on poverty induced by mine closure resonates with scholars who refer to the bad legacy of mine closures (Cloete and Marais, 2021; Vivoda et al., 2019). Instead of narrating positive memories about Tshikondeni, unskilled mineworkers had sad stories to tell. Marais et al. (2021) warns against depending on a single mining economy, which exposes mineworkers and communities to economic vulnerabilities after closure.

Skilled mineworkers were slightly shaken by mine closure. Some had good salaries that allowed them to make savings upon being informed about the imminent mine closure. One mineworker took the opportunity to start his own business using the savings and the pension payout. Some mining companies quickly absorbed the retrenched mineworkers who had skills and qualifications. These variations in social and economic experiences of mine closure between skilled and unskilled mineworkers show the dynamics of mine closure, and the need to avoid a blanket approach when analysing the impact. Mine closure policy planning, therefore, ought to be customised to the plight of the unskilled and less-paid mineworkers to mitigate the negative socio-economic ramifications of mine closure. These could include social

effects: strained relationships, psychological stress, economic stress, and the overall loss of jobs. More important, loss of capacity to find employment in other non-mining sectors.

5.3.3 Lack of skills to be absorbed in other employment sectors.

The study investigated the prospects of getting another employment after the mine closure. Findings showed that skills and qualifications were the primary determining factors for the employability of those former mineworkers who were still willing to continue working. Unskilled workers struggled with securing employment, and the few who managed to get employment had to downgrade to housemaid and EPW. As a result, unskilled mineworkers were exposed to post-mine closure, and social and economic vulnerabilities as they could not secure gainful employment. A good example is those who secured the EPW jobs that paid far less than they used to earn. Those with skills managed to secure employment with little difficulty as their skills were sought after by other mines. These findings concur with earlier studies by Molefe et al. (2006), that mines readily absorb skilled and semi-skilled workers compared to the unskilled, who essentially join the pool of the unemployed.

Strambo et al. (2019) and Hollywood (2002) claim that in situations of mine closure, skilled mine workers usually vacate or out-migrate to other mining towns to seek better opportunities, while the less skilled are unlikely to out-migrate. The finding aligns with March's (2017) observation that unskilled workers struggle to be absorbed by the mainstream labour market. Hence, they experienced severe economic disruptions after the mine closure and struggled to bounce back. Based on the above finding, the experience of securing another job after the mine closure is not homogenous between the skilled and non-skilled. To prevent outmigration and livelihood disruptions for unskilled mine workers, mine closure policymakers ought to align closure policy with mitigation measures. Fundamentally, mine closure legislative frameworks should always make provision for social and economic aspects targeting the less skilled personnel. Consideration should be given to reskilling and capacity development to make mine workers in the working category relevant to the job market and alternative career paths.

5.3.4 Lack of economic diversification for alternative sources of livelihood in rural areas.

The peripheral and remote location of the Tshikondeni mine negatively affected economic diversification to promote alternative sources of livelihood. Most former mineworkers depended entirely on the mine for employment and livelihood. The problem was compounded by the reality that the area was semi-arid and remote, with no significant economic activities (Cornish, 2012; Stacey et al., 2010). The rurality and lack of infrastructure development like shops, malls and industries implied that there was nowhere else the former unskilled mineworkers could go for jobs. The finding on rurality supports earlier postulation by Vivoda, et al., (2019), that most mines are in remote and rural areas, increasing communities' vulnerability to post-mine closure's social and economic challenges. Kevinen (2017) notes that rural communities are left with the mammoth task of dealing with degraded landscapes and distorted environments. This shows the multifaceted nature of post-mine closure challenges associated with the location of mines in rural areas.

Without alternative employment sources, most unskilled workers resorted to farming as an alternative source of livelihood, to get food and generate some income from the sale of fresh produce. Some female mineworkers used their baking skills to make fat cakes, scones, and pizza to sell to learners at the nearby schools. The alternative source of livelihood confirms the recommendation by Everingham and McKenzie (2019) that economic diversification in post-mine closure environments allows former mineworkers to be sustainable and resilient to economic shocks associated with mine closure. Another finding was that some males resorted to the environment, cutting firewood for sale, and fence installation. Despite their knowledge of the environmental repercussions of cutting down trees, selling firewood showed desperate measures to sustain a living. Lack of financial support inhibited unskilled mineworkers from exploring small business ventures. One mine worker who used his welding skills to start a small business at his homestead is a good example of how entrepreneurship carries weight as an alternative source of livelihood if there is capital injection.

The storyline is different for skilled people who manage to secure alternative sources of employment. As alluded to before, skilled workers get absorbed by other mines while the less

skilled join the pool of unemployed (Molefe et al., 2006; Strambo et al., 2019; Hollywood, 2002). Skilled mineworkers got a soft landing and did not have to explore alternative ways to sustain their livelihoods.

5.4 Recommendations Summary

Based on the study findings, this section presents recommendations for mitigating the social and economic costs of mine closure.

Table 3: Presentation of main findings and recommendations

Main Findings	Implications for Further Research
▪ Lack of mine closure policy compliance and enforcement for sustainable mine closure practices	▪ Bolstering mine closure policies to increase sustainable closures and cater for the social and economic needs of the unskilled who constitute the bulk of the workforce.
▪ **Failure to cope with social and economic realities of mine closure**	▪ Capacitating unskilled mineworkers to withstand mine closure's social and economic shocks.
▪ Lack of skills for most general mineworkers.	▪ To initiate reskilling /skills development programmes to mitigate social and economic vulnerabilities after mine closure.
▪ Lack of economic diversification for alternative livelihoods in rural areas.	▪ To strengthen CSR's role in rural development to promote economic diversification and reduce over-dependence on the mine for livelihoods.

5.4.1 Bolstering mine closure policies to increase sustainable closures.

The mine closure legislation in South Africa lacks an integration of social and economic aspects of mine closure. The experiences of the former unskilled mineworkers at the Tshikondeni mine point to closure policy flaws that expose mineworkers to severe social and economic problems. The lack of policy monitoring regarding sustainable closures is central to the problem. Despite mentioning social and economic aspects of mine closure in the existing policies at closure, there was no adherence to these issues. Furthermore, there was a lack of enforcement mechanisms by the Department of Mineral Resources and Energy and the local government authorities in charge of the sector in the Limpopo province. For sustainable closures and mitigating the social and economic costs of mine closure, the study recommends bolstering monitoring and evaluation of the mine closure process. Compliance with the social and economic aspects of mine closure should be a prerequisite and integral to issuing a closure licence. There is need to move away from policy polemics to action to ensure that unskilled mineworkers do not bear the socio-economic burdens of mine closures.

5.4.2 Strengthening unskilled mineworkers to withstand social and economic costs of mine closure.

Despite receiving information about the imminent closure of the mine, findings show that unskilled and low-salaried mineworkers battled with the socio-economic realities of mine closure. Reports of downscaling living standards, breaking down families and marriages, and mine closure-induced stress, among other challenges, revealed gaps in the Tshikondeni mine closure planning. The deduction is that the mine authorities failed to prepare the unskilled mineworkers for closure, and to stand any shocks inflicted on their lives by job loss. Involving the mineworkers in the closure planning process is one way to strengthen their physical and mental health. Instead of adopting a top-bottom dimension to mine closure, mining companies should ensure effective risk communication with those facing job losses, to prepare them for the worst outcomes. That also involves providing psycho-social support and walking with them as they transition to joblessness. To mitigate social and economic shocks caused by mine closure, a multisectoral intervention by the government, through the Ministry of Minerals and Resources and Energy, the concerned mining company, and the donor community, should create a fund to raise capital to assist unskilled mineworkers. Through capital injection,

unskilled mineworkers can start self-help projects such as poultry production, cooperatives, bricklaying, or fish farming. Tshikondeni area has rich clay soils that support the green economy, and with financial assistance, people can venture into full-scale agriculture. Capital injection for self-help projects has the potential to promote resilience and self-sustaining livelihoods beyond mine closure.

5.4.3 Reskilling / skills development programmes for unskilled mine workers.

The findings thus far show that unskilled workers bear the social and economic burdens of mine closure because they lack the required skills. Most unskilled mineworkers reached a dead end after the mine closure and struggled to be absorbed by some other mines or to explore alternative employment opportunities. The mere fact that they lacked the necessary skills means that they add to the statistics and pool of unemployed citizens. In line with the SLF postulations regarding capacity building, this study, therefore, recommends reskilling or capacity development for unskilled mineworkers to mitigate social and economic vulnerabilities after mine closure. Through the Ministry of Minerals and Resources and Energy, the government should develop a policy that obligates mining companies to train and equip mineworkers with skills to increase their employment options or venture into self-employment after mine closure. Skills such as welding, plumping, motor mechanic, or agriculture are vital because they open new avenues for self-sustaining projects. To the list can be added entrepreneurial, finance and business management skills. Through skills development, there is potential for building resilience and self-sustaining livelihoods. Reskilling capacitates mineworkers to bounce back and live decent lives.

5.4.4 Promoting economic diversification for alternative livelihoods in rural areas

The location of the Tshikondeni mine in the rural area of Limpopo province of South Africa disadvantaged unskilled mineworkers concerning alternative sources of livelihood after the mine closed. Mineworkers struggled to find alternative opportunities to substitute their dependence on mining. Economic diversification is, therefore, recommended to reduce total dependence on the mine for income and livelihoods. To mitigate the challenge associated with rurality and remoteness, developing the rural economy is imperative. As part of the CSR, mining companies should lead the local and economic development agenda, especially

infrastructure development, to attract diverse investment. That also helps to reduce outward migration by skilled people who are integral to the growth of the local economy. To diversify the economy and increase opportunities in rural areas—it is imperative to promote local industries such as agro-processing, dam construction for farming irrigation projects, and tourism. That also mitigates the challenge of boom and bust, where people enjoy the mine when it functions and only face abject poverty when it closes.

5.7.5 Implications for further research

The experience of mine closure at Tshikondeni Mine revealed that when mine closure happens, unskilled and low-salaried mineworkers bear social and economic burdens. They struggle with life pressures and find it difficult to bounce back. Further research is, therefore, needed to develop sustainable livelihood systems, strengthening the framework for post-mine closure contexts. That also involves developing a compensation and a sustainable wage framework for all unskilled mineworkers. The framework should involve critical stakeholders: the Ministry of Employment and Labour, Minerals and Resources and Energy, extractive companies, and mineworkers' unions. Research should explore how the proposed framework can be integrated and operationalised in mine closure plans, to reduce unskilled workers' social and economic vulnerabilities in the post-mine closure contexts.

Bibliography

Ackerman, M., Van der Waldt, G. and Botha, D., 2018. Mitigating the socio-economic consequences of mine closure. *Journal of the Southern African Institute of Mining and Metallurgy*, *118*(4), pp.439-447.

Adler, R.A., Claassen, M., Godfrey, L. and Turton, A.R., 2007. Water, mining, and waste: an historical and economic perspective on conflict management in South Africa. *The Economics of Peace and Pecurity Journal*, *2*(2).

Alberts, R., Wessels, J.A., Morrison-Saunders, A., McHenry, M.P., Sequeira, A.R., Mtegha, H. and Doepel, D., 2017. Complexities with extractive industries regulation on the African continent: What has 'best practice 'legislation delivered in South Africa?. *The Extractive Industries and Society*, *4*(2), pp.267-277.

Aléx, L., 2010. Resilience among very old men and women. *Journal of Research in Nursing*, *15*(5), pp.419-431.

Almano, Z., 2022. The Rehabilitation and closure of mines: A failure in the protection of human rights. University of Cape Town, Mineral Energy Law. [Online] Available at https://law.uct.ac.za/mineral-law/articles/2022-11-10-rehabilitation-and-closure-mines-failure-protect -minesmines (Accessed, 12 June 2022).

American Psychological Association (APA)., 2014. The road to resilience. Washington, DC: American Psychological Association.[Online] Available at: https://uncw. edu/ studentaffairs/ committees /pdc/documents/the%20road%20to%20resilience.pdf (Accessed, 18 November 2022).

Asia-Pacific Economic Cooperation (APEC)., 2019. Mine closure checklist for governments. [Online] Available at: https://www.apec.org/Publications/2018/03/Mine-Closure---Checklist-for-Governments (Accessed, 23 March 2021).

Asia-Pacific Economic Cooperation (APEC)., 2018. Mine closure checklist for governments. APEC Mining Task Force. [Online] Available at: http//:www.apec.org (Accessed, 23 March 2021).

Auty, R., 2002. *Sustaining development in mineral economies: the resource curse thesis*. London: Routledge.

Babbie, E.R., 2020. *The Basics of social research*. Boston: Cengage Learning.

Ragin, C.C. and Becker, H.S. (eds)., 1992. *What is a case?: exploring the foundations of social inquiry*. Cambridge: Cambridge university press.

Bainton, N. and Holcombe, S., 2018. A critical review of the social aspects of mine closure. *Resources Policy*, *59*, pp.468-478.

Basedau, M. and Lacher, W., 2006. *A paradox of plenty? Rent distribution and political stability in oil states.* German Institute of Global and Area Studies: Working Papers, 21/2006.

Bebbington, A. and Humphreys Bebbington, D., 2011. An Andean avatar: Post-neoliberal and neoliberal strategies for securing the unobtainable. *New Political Economy*, *16*(1), pp.131-145.

Blanche, M.T., Blanche, M.J.T., Durrheim, K. and Painter, D. (eds)., 2006. *Research in practice: Applied methods for the social sciences*. Juta and Company Ltd.

Bobbins, K.L., 2013. The legacy and prospects of the Gauteng City-Region's mining landscapes. *WIT Transactions on Ecology and the Environment*, *179*, pp.1363-1374.

Bonanno, G.A., 2008. Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events?. *American Psychologist,* 1, pp.101-113.

Boschma, R. and Frenken, K., 2018. Evolutionary economic geography, in G Clarke, M Fieldman and S Wojcik (eds),*The new Oxford handbook of economic geography*, pp.213-229.Oxford:Oxford University Press.

Botha, D., Van der Waldt, G. and Ackermann, M., 2018. Potential socio-economic consequences of mine closure. *TD: The Journal for Transdisciplinary Research in Southern Africa*, *14*(1), pp.1-11.

Burton, J., Marquard, A. and McCall, B., 2019. *Socio-economic considerations for a Paris Agreement-compatible coal transition in South Africa*. University of Cape Town: Energy Research Centre.

Carrington, D., 2017. The world's most toxic town: the terrible legacy of Zambia's lead mines. *The Guardian*, *28*. [Online] Available at: https://www. theguardian.com/ environment/2017/may/28/the-worlds-most-toxic-town-the-terrible-legacy-of-zambias-lead-mines (Accessed, 28 June 2021).

Cawood, FT and Minnitt, R., 1998. A historical perspective on the economics of the ownership of mineral rights ownership. *Journal of the Southern African Institute of Mining and Metallurgy*, *98*(7), pp.369-376.

Cawood, F.T., 2004. The Mineral and Petroleum Resources Development Act of 2002: A paradigm shift in mineral policy in South Africa. *Journal of the Southern African Institute of Mining and Metallurgy*, *104*(1), pp.53-64.

Chamber of Mines of South Africa., 2017. Integrated mining review: Making mining matter. [Online] Available at: https://www. mineralscouncil.org.za/reports/2017/#home (Accessed, 18 November 2022).

Chambers, R., 1995. Poverty and livelihoods: whose reality counts? *Environment and urbanization*, *7*(1), pp.173-204.

Chambers, R. and Conway, G., 1992. *Sustainable rural livelihoods: practical concepts for the 21st century*. Institute of Development Studies: United Kingdom.

Chuhan-Pole, P., Dabalen, A.L. and Land, B.C., 2017. *Mining in Africa: are local communities better off?* World Bank Publications.

Clinton, J., 2008. Resilience and recovery. *International Journal of Children's Spirituality*, *13*(3), pp.213-222.

Cloete, J. and Marais, L., 2021. Mine housing in the South African coalfields: The unforeseen consequences of post-apartheid policy. *Housing Studies*, *36*(9), pp.1388-1406.

Connelly, L.M., 2010. What is phenomenology? *Medical-Surgical Nursing,* 19(2), pp. 96-100.

Cornish, L., 2012. Tshikondeni-almost time to say goodbye: hot seat. *Inside Mining*, *5*(8), pp.12-13.

Corruption Watch., 2017. Mining for sustainable development research programme. *Johannesburg, South Africa*.[Online] Available at: https://www.corruptionwatch.org.za/wp-content/uploads/2017/10/Mining-for-Sustainable-Development-report-South-Africa-2017.pdf (Accessed, 12 May 2023)

Creswell, J. W., 2007. *Qualitative inquiry and research design: choosing among five approaches.* Thousand Oaks: Sage Publications.

Creswell, J.W., 2005. *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River: Pearson Education.

Crous, C., Owen, J.R., Marais, L., Khanyile, S. and Kemp, D., 2021. Public disclosure of mine closures by listed South African mining companies. *Corporate Social Responsibility and Environmental Management*, *28*(3), pp.1032-1042.

Council for Scientific and Industrial Research (CSIR)., 2019. A CSIR perspective on South Africa's post-mining landscape. CSIR Report No. 16928. Pretoria: CSIR.

Cui, C.Q., Wang, B., Zhao, Y.X., Zhang, Y.J. and Xue, L.M., 2020. Risk management for mine closure: A cloud model and hybrid semi-quantitative decision method. *International Journal of Minerals, Metallurgy and Materials*, *27*, pp.1021-1035.

Department of Minerals and Energy., 1998. Minerals and Mining Policy for South Africa 1998: Government of the Republic of South Africa.

Di John, J., 2010. The 'resource curse': theory and evidence. *Elcano Newsletter*, (72), pp.1-9.

Dixon, C., 2003. Mine Closure from a legal perspective: Do the provisions of the New Mineral and Petroleum Resources Development Act and draft regulations make closure legally attainable? *Journal of the Southern African Institute of Mining and Metallurgy*, *103*(8), pp.483-488.

Department of Mineral Resources and Energy (DMER), 2021. Draft National Mine Closure Strategy. Government of the Republic of South Africa: Government Gazette.

Eatough, V. and Smith, J.A., 2017. Interpretative phenomenological analysis. *The Sage Handbook of Qualitative Research in Psychology*, pp.193-209.

Ennis, G., Tofa, M. and Finlayson, M., 2014. Open for business but at what cost? Housing issues in 'Boomtown'Darwin. *Australian Geographer*, *45*(4), pp.447-464.

Ericsson, M. and Löf, O., 2019. Mining's contribution to national economies between 1996 and 2016. *Mineral Economics*, *32*(2), pp.223-250.

Evans, G. and Phelan, L., 2016. Transition to a post-carbon society: Linking environmental justice and just transition discourses. *Energy Policy*, *99*, pp.329-339.

Everingham, J.A. and Mackenzie, S., 2019. Assessing social impacts of mine closure. In *IAIA19 Conference: Evolution or Revolution: Where next for impact assessment*. University of Queensland: Sustainable Minerals Institute.

Fair, L., 2020. Sustainable social transitioning at mine closure: a paradigm shift, *Mining Review Africa* Issue 4. [Online] Available at:http://clarioneventsmedia. com/Media/MiningReviewAfrica/ 2020 /2020issue4/ index. html?r=96 [Accessed, 23 April 2021].

Fourie, A. and Brent, A.C., 2006. A project-based mine closure model (MCM) for sustainable asset life cycle management. *Journal of Cleaner Production*, *14*(12-13), pp.1085-1095.

Frye, I., 2013. Policy Brief 2: Towards a decent living level. *Studies in Poverty and Inequality Institute*, pp.1-11.

Gillham, B., 2008. *Developing a questionnaire*. A and C Black.

Giorgi, A., 2009. *The descriptive phenomenological method in psychology: A modified Husserlian approach*. Duquesne university press.

Giorgi, A., 2008. The descriptive phenomenological method in psychology: A modified Husserlian approach, *Journal of Phenomenological Psychology* 41(2), pp. 269-276.

Gong, Y., Zhang, R., Yao, K., Liu, B. and Wang, F., 2020. A livelihood resilience measurement framework for dam-induced displacement and resettlement. *Water*, *12*(11), p.3191.

Goswami, S., 2014. Sustainable livelihood strategy in Mining. *International Journal in Management and Social Science*, *2*(12), pp.338-356.

Grant, C.D. and Lacy, H.W.B., 2016, March. Developing Anglo American's integrated closure planning system requires people, process and technology working together. In *Mine Closure 2016: Proceedings of the 11th International Conference on Mine Closure* (pp. 581-594). Australian Centre for Geomechanics.

Green, F., 2018. Transition policy for climate change mitigation: Who, what, why and how. *Australian National University*: *Centre for Climate Economics.*

Gregory, C.E., 2021. *A concise history of mining*. CRC Press.

Grigsby, W.J., 2004. The gendered nature of subsistence and its effect on customary land tenure. *Society and Natural Resources*, *17*(3), pp.207-222.

Groenewald, T., 2004. A phenomenological research design illustrated. *International journal of Qualitative Methods*, *3*(1), pp.42-55.

Haney, M., 2003. *Mine Closure and its Impact on the Community* (Vol. 3083). World Bank Publications.

Hassani, P., Izadi-Avanji, F.S., Rakhshan, M. and Majd, H.A., 2017. A phenomenological study on resilience of the elderly suffering from chronic disease: a qualitative study. *Psychology Research and Behavior Management*, pp.59-67.

Haywood, L., and de Wet, B., 2017. Understanding the role of environmental management in beneficiation from mine externalities. Pretoria: CSIR.

Heikkinen, P., Noras, P., Salminen, R., Mroueh, U.M., Vahanne, P., Wahlström, M., Kaartinen, T., Juvankoski, M., Vestola, E., Mäkelä, E. and Leino, T., 2008. *Mine Closure*

Handbook: Environmental Techniques for the Extractive Industry. Geological Survey of Finland.

Hermanus, M., Walker, J., Watson, I. and Barker, O., 2015. Impact of the South African Minerals and Petroleum Resources Development Act on levels of mining, land utility and people. *Labour, Capital and Society/Travail, capital et société*, *48*(1 and 2), pp.10-38.

Heyns, A., 2019. Mining community development in South Africa: A critical consideration of how the law and development approach the concept "community". *Law and Development Review*, *12*(2), pp.561-593.

Hockley, D.E. and Hockley, L.C., 2015. Some histories of mine closure, the Idea. Mine Closure Conference, 1-3 June, Canada: Vancouver.

Hollywood, E., 2002. Mining, migration and immobility: towards an understanding of the relationship between migration and occupation in the context of the UK mining industry. *International Journal of Population Geography*, *8*(4), pp.297-314.

.

Human Rights Watch (HRW)., 2022.The Forever Mines: Perpetual rights risks from unrehabilitated coal mines in South Africa. [Online] Available at: https://www.hrw.org/report/2022/07/05/forever-mines/perpetual-rights-risks-unrehabilitated-coal-mines-south-africa (Accessed, 26 June 2022).

Humby, T.L., 2015. 'One environmental system': aligning the laws on the environmental management of mining in South Africa. *Journal of Energy and Natural Resources Law*, *33*(2), pp.110-130.

International Council on Mining and Metals (ICMM)., 2019. Integrated mine closure: good practice guide, London. [Online] Available at: https://www.icmm.com/en-gb/our-principles/mining-principles/principle-6(Accessed,17 May 2022).

International Finance Corporation (IFC) in Africa., 2014. Sustainable and responsible mining in Africa: Getting started guide. World Bank. [Online] Available at: www.ifc.org/Africa (Accessed, 15 February 2021).

Kemp, D., 2010. Mining and community development: problems and possibilities of local-level practice. *Community Development Journal*, *45*(2), pp.198-218.

Khanyile, S. and Marais, L., 2024. Mine closure policies and strategies in South Africa, in S Matebesi, L Marais, and V Nel (eds). *Local responses to mine closure in South Africa: Dependencies and social disruption.* London: Routledge.

Kim-Cohen, J. and Turkewitz, R., 2012. Resilience and measured gene–environment interactions. *Development and Psychopathology*, *24*(4), pp.1297-1306.

Kivinen, S., 2017. Sustainable post-mining land use: are closed metal mines abandoned or re-used space? *Sustainability*, *9*(10), p.1705.

Klopper, D. and Wessels, J.A., 2017. Investigation of Western Australia's rehabilitation fund as a fiscal policy solution for South African abandoned mines. *Journal of the Southern African Institute of Mining and Metallurgy*, *117*(11), pp.1081-1087.

Koka, M., 2022. 'State Still Failing Mining Communities, SowetanLive,22 February, [Online] Available at: https://www.sowetanlive.co.za/news/south-africa/2022-02-22-three-mines-fail-to-comply-with-obligations-to-help-sekhukhune-community-report/ (Accessed, 25 February 2022).

Larkin, M., Watts, S. and Clifton, E., 2006. Giving voice and making sense in interpretative phenomenological analysis. *Qualitative research in psychology*, *3*(2), pp.102-120.

Laurence, D., 2006. Optimisation of the mine closure process. *Journal of Cleaner Production*, *14*(3-4), pp.285-298.

Laurence, D., 2011. Establishing a sustainable mining operation: an overview. *Journal of Cleaner Production*, *19*(2-3), pp.278-284.

Limpitlaw, D. and Hoadley, M., 2006, September. Faultlines in mine closure planning in a developing country context. In *Proceedings of the First International Seminar on Mine Closure* (pp. 803-809). Perth, Australia: Australian Centre for Geomechanics.

Llewellyn, L., 2018. Why there's resistance to coal mining at a world heritage site in South Africa. *The Conversation,* September 12. [Online] Available at: https://theconversation.com/why-theres-resistance-to-coal-mining-at-a-world-heritage-site-in-south-africa-102816 (Accessed, 23 March,2021).

Long, N., 2004. Actors, interfaces and development intervention: meanings, purposes and powers. *Development intervention: Actor and activity perspectives*, pp.14-36.

Madebwe, C., 2004. The impact of mine closures on rural population dynamics: The case of Zhombe in Kwekwe District, Midlands Province, Zimbabwe. *Eastern Africa Social Science Research Review*, *20*(2), pp.59-70.

Mancini, L. and Sala, S., 2018. Social impact assessment in the mining sector: Review and comparison of indicators frameworks. *Resources Policy*, *57*, pp.98-111.

Manesis, S., 2023. How does mining contribute to the economy of South Africa? South *Africanza.Com* [Online] Available at: https://southafricanza.com/how-does-mining-contribute-to-the-economy-of-south-africa/# :~:text= Mining%20has%20a% (Accessed, 12 Octoiber,2023).

Marais, L., 2013, December. The impact of mine downscaling on the Free State Goldfields. In *Urban Forum* (Vol. 24, pp. 503-521). Springer Netherlands.

Marais, L., 2022. *The social impacts of mine closure in South Africa: Housing policy and place attachment*. Routledge: Taylor and Francis.

Marais, L. and Cloete, J., 2013. Labour migration, settlement, and mine closure in South Africa. *Geography*, *98*(2), pp.77-84.

Marais, L., Burton, J., Campbell, M. and Nel, E., 2021.Mine closure in the coal industry: Global and national perspectives, in L Marais, P Burger, M Campbell, SP Denoon-Stevens and D van Rooyen, *Coal and energy in South Africa: Considering a just transition*. Edinburgh: Edinburgh University Press. pp.34-43.

Marais, L., van Rooyen, D., Nel, E. and Lenka, M., 2015, October. Mine closure, the resource curse and Marikana flu: responses to mine downscaling in Matlosana and Matjhabeng. In *Pretoria: Economies of Regions Learning Network (ERLN) Conference-Economies of Regions: Economic Development at the Sub-National Level*. pp. 14-16.

March, M.C. 2017. *Social terrains of mine closure in the Philippines*. Routledge: Taylor and Francis.

Maree, K., and Pietersen, J., 2016. The quantitative research process, in K Maree (ed.), *First Steps in Research*. Pretoria: Van Schaik Publishers. pp. 192–202.

Marshall, B., Cardon, P., Poddar, A. and Fontenot, R., 2013. Does sample size matter in qualitative research?: A review of qualitative interviews in IS research. *Journal of Computer Information Systems*, *54*(1), pp.11-22.

Marshall, C. and Rossman, G.B., 2014. *Designing qualitative research*. London: Sage Publications.

Mason, J., 2017. Qualitative researching. London: Sage Publications.

Matebesi, S., Marais, L. and Nel, V. (eds)., 2024. *Local responses to mine Closure in South Africa: Dependencies and social disruption*. London: Routledge.

Matikinca, A., 2021. *New strategy for sustainable closure of mines*. Oxpeckers: Investigative Environmental Journalism. [Online] Available at: https://oxpeckers.org/2021/07/new-strategies-for-closing-mines/#:~:text=In%20May% 202021%20the% 20government,regional% 20approach%20to%20mine%20closures. (Accessed, 12 June 2023).

Maxwell, J.A., 2012. *Qualitative research design: An interactive approach*. London: Sage publications.

Mbazima, N., 2020. *Reviving a declining mining industry.* Viewpoints 9. Parktown: Centre for Development Enterprise.

McGlade, C. and Ekins, P., 2015. The geographical distribution of fossil fuels unused when limiting global warming to 2 C. *Nature*, *517*(7533), pp.187-190.

McKenzie, B., 2020. Mining closure. *Lexology.Com.* [Online] Available at: https://www. lexology.com/library/detail.aspx?g=2e5a22f0-db18-46b5-ba7f-957424c6 53b0 (Accessed, 28 April, 2021).

McNamara, C., 1999. General guidelines for conducting interviews, authenticity consulting. LLC: Recuperado de. [Online] Available at:http://www. managementhelp. org/evaluatn/intrview. htm. (Accessed,23 July 2021).

Merriam, S.B., 2015. Qualitative research: Designing, implementing, and publishing a study. In *Handbook of research on scholarly publishing and research methods*. IGI Global. pp. 125-140.

Meyersfeld, B., 2017. Empty promises and the myth of mining: Does mining lead to pro-poor development?. *Business and Human Rights Journal*, *2*(1), pp.31-53.

Mhlongo, S.E. and Amponsah-Dacosta, F., 2016. A review of problems and solutions of abandoned mines in South Africa. *International Journal of Mining, Reclamation and Environment*, *30*(4), pp.279-294.

Mhlongo, S.E., 2023. Physical hazards of abandoned mines: A review of cases from South Africa. *The Extractive Industries and Society*, *15*, p.101285.

Milaras, M., 2015. *The judicious use of environmental sustainability indicators in support of mine closure in South Africa*. Auckland Park: University of Johannesburg.

Minerals Council South Africa., 2018. Facts and Figures 2017. [Online] Available at: http://www. mineralscouncil.org.za/industry-news/publications/facts-and-figures(Accessed, 12 May 2022).

Molefe, N., Molapo, M.P. and Chunderdoojh, B.P., 2006, September. Socio-Economically Sustainable Communities Post Mine Closure– A case study of the South African coal mining industry, in AB Fourie and M Tibbett (eds), *Mine Closure 2006: Proceedings of the first international seminar on mine closure* (pp. 819-827). Perth: Australian Centre for Geomechanics.

Morse, J.M., 2000. Determining sample size. *Qualitative health research*, *10*(1), pp.3-5.

Mouton, J., 2001. *How to succeed in your master's and doctoral studies: A South African guide and resource book*. Pretoria: Van Schaik.

Mpanza, M., Adam, E. and Moolla, R., 2021. A critical review of the impact of South Africa's mine closure policy and the winding-up process of mining companies. *Journal for Transdisciplinary Research in Southern Africa*, *17*(1), pp.1-21.

Nel, E. and Binns, T., 2002. Decline and response in South Africa's Free State goldfields: local economic development in Matjhabeng. *International Development Planning Review*, *24*(3), pp.249-270.

Nephalama, A. and Muzerengi, C., 2016. Assessment of the influence of coal mining on groundwater quality: Case of Masisi Village in the Limpopo Province of South Africa. *Proceedings of the Freiberg/Germany, Mining Meets Water—Conflicts Solutions, Leipzig, Germany*, pp.11-15.

Nochols, B., Veiga, M., van Zyl, D. and Xavier, A.M., 2015. Closure of artisanal small scale gold mining processing plants in Ecuador. *Journal of Management and Sustainability*, *5*, pp.41-47.

Ntema, J., Marais, L., Cloete, J. and Lenka, M., 2023. Mine closure in Matjhabeng in the Free State goldfields, South Africa: Implications for households. *The Extractive Industries and Society*, *14*, p.101257.

O'Laughlin, B., 2004. Rural livelihood and diversity in developing countries. *Book reviews. Development and Change*, *35*(2), pp.385-403.

O'Faircheallaigh, C. and Lawrence, R., 2019. Mine closure and the Aboriginal estate. *Australian Aboriginal Studies*, (1), pp.65-81.

Owen, J. and Kemp, D., 2018. *Mine closure and social performance: an industry discussion paper.* University of Queensland: Centre for Social Responsibility in Mining, Sustainable Minerals Institute.

Owen, J.R., Kemp, D. and Marais, L., 2021. The cost of mining benefits: Localising the resource curse hypothesis. *Resources Policy*, *74*, p.102289.

Palmer, M., Larkin, M., De Visser, R. and Fadden, G., 2010. Developing an interpretative phenomenological approach to focus group data. *Qualitative research in psychology*, *7*(2), pp.99-121.

Parshley, J.V. and MacCallum, C.S., 2016. Attractive nuisances and wicked solutions. In *Mine Closure 2016: Proceedings of the 11th International Conference on Mine Closure* (pp. 229-240). Perth: Australian Centre for Geomechanics.

Pikirayi, I. and Magoma, M., 2021. Retrieving intangibility, stemming biodiversity loss: The case of sacred places in Venda, Northern South Africa. *Heritage*, *4*(4), pp.4524-4541.

Reiners, G.M., 2012. Understanding the differences between Husserl's (descriptive) and Heidegger's (interpretive) phenomenological research. *Journal of Nursing and Care*, *1*(5), pp.1-3.

Rhee, S., Nyanza, E.C., Condon, M., Fisher, J., Maduka, T. and Benshaul-Tolonen, A., 2018. Understanding environmental, health and economic activity interactions following transition of ownership in gold mining areas in Tanzania: A case of private to public. *Land Use Policy*, *79*, pp.650-658.

Ritchie, J. and Lewis. J. (eds.)., 2003. *Qualitative research practice: A guide for social Science students and researchers.* London: Sage Publications.

Rixen, A. and Blangy, S., 2016. Life after Meadowbank: Exploring gold mine closure scenarios with the residents of Qamini'tuaq (Baker Lake), Nunavut. *The Extractive Industries and Society*, *3*(2), pp.297-312.

Roberts, C.W., 2015. The other resource curse: extractives as development panacea. *Cambridge Review of International Affairs*, *28*(2), pp.283-307.

Sandelowski, M., 1995. Sample size in qualitative research. *Research in Nursing and Health*, *18*(2), pp.179-183.

Scoones, I., 2013. Livelihoods perspectives and rural development. In *Critical Perspectives in Rural Development Studies*, pp. 159-184.

Segerstedt, E. and Abrahamsson, L., 2019. Diversity of livelihoods and social sustainability in established mining communities. *The Extractive Industries and Society*, *6*(2), pp.610-619.

Serrat, O., 2017. The sustainable livelihoods approach. *Knowledge solutions: Tools, methods, and approaches to drive organizational performance*, pp.21-26.

Sesele, K., Marais, L. and van Rooyen, D., 2021. Women and mine closure: A case study of policy in South Africa. *Resources Policy*, *72*, p.102059.

Shaw, R., 2001. Why use interpretative phenomenological analysis in health psychology?. *Health Psychology Update*, *10*, pp.48-52.

Siyongwana, P.Q. and Shabalala, A., 2019. The socio-economic impacts of mine closure on local communities: evidence from Mpumalanga Province in South Africa. *GeoJournal*, *84*, pp.367-380.

Smith, J.A., Flower, P. and Larkin, M., 2009. Interpretative phenomenological analysis: Theory, method, and research. London: Sage Publications.

South Africa- Marikana Commission of Inquiry., 2015. *Marikana commission of inquiry: Report on matters of public, national and international concern arising out of the tragic incidents at the Lonmin mine in Marikana, in the Northwest Province*. South Africa: Government Printers.

Stacey, J., Naude, A., Hermanus, M. and Frankel, P., 2010. The socio-economic aspects of mine closure and sustainable development: literature overview and lessons for the socio-economic aspects of closure-Report 1. *Journal of the Southern African Institute of Mining and Metallurgy*, *110*(7), pp.379-394.

Strambo, C., Aung, M.T. and Atteridge, A., 2019. *Navigating coal mining closure and societal change: learning from past cases of mining decline*. Stockholm: Stockholm Environment Institute.

Sutton, J. and Austin, Z., 2015. Qualitative research: Data collection, analysis, and management. *The Canadian Journal of Hospital Pharmacy*, *68*(3), p.226-231.

Swart, E., 2003. The South African legislative framework for mine closure. *Journal of the Southern African Institute of Mining and Metallurgy*, *103*(8), pp.489-492.

Tapela, T., 2002, September. Planning for Economic Diversification and Sustainable Communities in Mining Towns: towards a development planning framework. In *Planning Africa 2002 International Conference. Durban*.

Tshangana, M., 2015. *Selected committee presentation on the revitalisation of distressed mining towns programme.* Pretoria: National Department of Human Settlements.

United Nations Department of Economic and Social Affairs (UNDESA)., 2013. Cooperatives can build resilience during crises, New York. [Online] Available at: https://www.un.org/en/ development/ desa/news/social /cooperatives.html (Accessed, 22 June 2021).

United Nations General Assembly (UNGA).,1962. General Assembly Resolution 1803 (XVII) of 14 December 1962, "Permanent sovereignty over natural resources" Geneva-Switzeerland. [Online] Available at:https://www.ohchr.org/ sites/default/files/Documents/ProfessionalInterest/resources.pdf (Accessed, 29 October 2021).

United Nations Sustainable Development (UNSD)., 1992. United Nations Conference on environment and development Rio de Janeiro, Brazil, 3 to 14 June 1992, AGENDA 21, [Online] Available at: https://sustainabledevelopment. un.org/content/ documents/ Agenda21.pdf (Accessed, 20 February 2021).

United States Surface Mining Control and Reclamation Act .1977. [Online] Available at: https://www. osmre. gov/lrg/docs/SMCRA.pdf [Accessed, 28 March, 2021].

Vagle, M.D., 2018. *Crafting phenomenological research*. London: Routledge.

van der Watt, P. and Marais, L., 2019. Normalising mining company towns in Emalahleni, South Africa. *The Extractive Industries and Society*, *6*(4), pp.1205-1214.

Van Druten, E.S. and Bekker, M.C., 2017. Towards an inclusive model to address unsuccessful mine closures in South Africa. *Journal of the Southern African Institute of Mining and Metallurgy*, *117*(5), pp.485-490.

Van Heerden, J.J., 2016. *Sustainable mining communities post mine closure: Critical reflection on roles and responsibilities of stakeholders towards local economic development in the City of Matlosana* (Doctoral dissertation, Stellenbosch: Stellenbosch University).

Veiga, M.M., Scoble, M. and McAllister, M.L., 2001. Mining with communities. *Natural Resources Forum* 25(3), pp. 191-202.

Vivoda, V. and Kemp, D., 2019. How do national mining industry associations compare on sustainable development? *The Extractive Industries and Society*, *6*(1), pp.22-28.

Vivoda, V., Kemp, D. and Owen, J., 2019. Regulating the social aspects of mine closure in three Australian states. *Journal of Energy & Natural Resources Law*, *37*(4), pp.405-424.

Walsh, A., 2012. After the rush: Living with uncertainty in a Malagasy mining town. *Africa*, *82*(2), pp.235-251.

WCED, S.W.S., 1987. World commission on environment and development. *Our common future*, *17*(1), pp.1-91.

Warden-Fernandez, J., 2001. Indigenous communities and mineral development. *Mining, Minerals, and Sustainable Development*, *59*, pp.1-30.

Watson, I. and Olalde, M., 2019. The state of mine closure in South Africa-what the numbers say. *Journal of the Southern African Institute of Mining and Metallurgy*, *119*(7), pp.639-645.

Wojnar, D.M. and Swanson, K.M., 2007. Phenomenology: an exploration. *Journal of holistic nursing*, *25*(3), pp.172-180.

World Bank., 2002. It's not over when it's over: Mine closure around the world. [Online] Available at: http://siteresources.worldbank.org/INTOGMC/Resources/notoverwhenover.pdf [Accessed, 12 March,2021].

Xavier, A., Veiga, M.M. and van Zyl, D., 2015. Introduction and assessment of a socio-economic mine closure framework. Journal of Management and Sustainability, 5(1), pp. 38-49.

Yin, R.K., 2013. Validity and generalization in future case study evaluations. *Evaluation*, *19*(3), pp.321-332.

Government Acts

Atmospheric Pollution Prevention Act (Act 45 of 1965).

Companies Act 61 of 1973, Government Gazette. Republic of South Africa. Pretoria: Government Printer.

Companies Act 71 of 2008. Government Gazette. Republic of South Africa [statute on the Internet]. Pretoria: Government Printer.

Constitution of the Republic of South Africa (Act No. 108 of 1996), Government Gazette.

Fanie Botha Accord (1975), Chamber of Mines.

Mine and Works Act (27 of 1956).

Mine Health and Safety Act (MHSA) of 1996 (Act 29 of 1996).

Mineral and Petroleum Resources Development Act (MPRDA) (No. 28 of 2002), Government Gazette, Vol. 448, Report no. 23922, Cape Town.

Mineral and Petroleum Resources Development Amendment Act (No. 49 of 2008), Government Gazette, Vol. 526, Report no. 32151, Cape Town.

Minerals Act (No. 50 of 1991), Government Gazette, Vol. 311, Report no. 13253, Cape Town.
Mines and Works Act (No. 27 of 1956), Printed in the Union of South Africa by Cape Times Ltd, Parow.

Mining Rights Act (No. 20 of 1967), National Gazette, Vol. 27, Report no. 434, Cape Town.
National Environmental Management Act (Act 107 of 1998).

National Environmental Management Act (No. 107 of 1998). Government Gazette, Report no. 19519, 1540. Cape Town.

National Environmental Management: Air Quality Act (No. 39 of 2004), Government Gazette, Report no. 27318, 476. Cape Town.

National Environmental Management: Waste Act (No. 59 of 2008), Government Gazette, Vol. 525, Report no. 32000, Cape Town.

National Water Act (No. 36 of 1998), Government Gazette, Vol. 398, Report no. 19182, Cape Town.
Nuclear Energy Act (No. 46 of 1999), Government Gazette, Vol. 414, Report no. 20759, Cape Town.

ANNEXURE ONE

Ethics Approval Letter

GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

18-May-2022

Dear Mr Jan Cloete JS

Amendment Approved

Research Project Title:
Mine closure narratives in South Africa

Ethical Clearance number:
UFS-HSD2020/0653/3006

ANNEXURE TWO

Consent Form

RESEARCH STUDY INFORMATION LEAFLET AND CONSENT FORM

DATE

June 2022

TITLE OF THE RESEARCH PROJECT

Mine closure narratives in South Africa

RESEARCHERS' NAMES AND CONTACT NUMBERS:

Patrick Dzimiri	20173325 25	Contact number
Siphiwe Mathe	20206111 96	Contact number

FACULTY AND DEPARTMENT:

Faculty of Economic and Management Sciences Centre for Development Support

STUDY LEADERS' NAME AND CONTACT NUMBER:

Prof Lochner Marais (0404707)	051 401 2978
Mr Jan Cloete (0851348)	051 401 3599

WHAT IS THE AIM/PURPOSE OF THE STUDY?

To gather stories on how former mineworkers manage to sustain their livelihoods after losing jobs in the mining industry.

WHO IS DOING THE RESEARCH?

Two students who are doing research for the degree Master of Development Studies.

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

This study has received approval from the Research Ethics Committee of UFS. A copy of the approval letter can be obtained from the researcher.

Approval number: Insert approval number

WHY ARE YOU INVITED TO TAKE PART IN THIS RESEARCH PROJECT?

We have been referred to you by someone else who has lost their job in the mining industry and taken part in the study. As someone who has experience in working in the industry and losing your job, we would like to hear your story.

205 Nelson Mandela Drive/Rylaan, Park West/Parkwes, Bloemfontein 9301, South Africa/Suid-Afrika

P.O. Box/Posbus 339, Bloemfontein 9300, South Africa/Suid-Afrika, T: +27(0)51 401 9111, www.ufs.ac.za

WHAT IS THE NATURE OF PARTICIPATION IN THIS STUDY?

Participation will be in the form of two interviews. The first will be for one hour, telling us your story. After we have had time to write up your story, we will return to ask some more questions to clarify some information. The second interview should only take about 20 minutes

CAN THE PARTICIPANT WITHDRAW FROM THE STUDY?

Participation in the study is voluntary, there is no penalty for non-participation, and you are under no obligation to consent to participation. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time and without providing a reason, and upon your request, the information you have provided will be destroyed.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

Unfortunately, we cannot provide you with any benefits, material or otherwise, for your participation in the project. Your story will, however, help us understand the impact of job losses in the mining industry.

WHAT IS THE ANTICIPATED INCONVENIENCE OF TAKING PART IN THIS STUDY?

Beyond the 80 minutes it will take to take part in the two interviews, we do not foresee any inconvenience or risk.

WILL WHAT I SAY BE KEPT CONFIDENTIAL?

Your name will not be recorded anywhere and no one will be able to connect you to the answers you give. Your responses will be given a pseudonym, and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. Your answers will only be viewed by the interviewer and their supervisors. Your responses may be reviewed by people responsible for making sure that research is done correctly, such as members of the Research Ethics Committee. Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

HOW WILL THE INFORMATION BE STORED AND ULTIMATELY DESTROYED?

All electronic information will be stored on a password-protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. The information will be deleted after five years have passed.

HOW WILL THE PARTICIPANT BE INFORMED OF THE FINDINGS / RESULTS OF THE STUDY?

If you would like to be informed of the final research findings, please contact the interviewer. Should you require any further information or you have concerns about how the research has been conducted, please contact the supervisors.

Thank you for taking the time to read this information sheet and for participating in this study.

I, the undersigned,

_____(*participant's full names to be included*), (the "**Participant**")

confirm that I voluntarily agree to participate in the

research study referred to as the Mine closure

narratives in South Africa (the **"Study**")

and which Study is being conducted by

_____

(*insert the name of the researcher*), (the "**Researcher**").

I, the undersigned Participant, further confirm that–

1. the Researcher has explained the nature, procedure, potential benefits and anticipated inconvenience of my participation in the Study;
2. I have read (or had explained to me) and understood the Study as explained in the attached information sheet;
3. I have had sufficient opportunity to ask questions and am prepared to participate in the Study;
4. I understand that my participation in the Study is entirely voluntary and that I am free to withdraw at any time without penalty (if applicable);
5. I voluntarily provide the UFS and the Researcher with my personal information and consent to the UFS and the Researcher collecting, disclosing and processing my personal information in order to conduct the Study and any related activities in relation thereto;
6. I hereby acknowledge and confirm that I understand the purpose for which the UFS and the Researcher may collect, store, use, delete, destroy, outsource, transfer or otherwise process, as the

context and circumstances may require and as contemplated in terms of POPIA, my personal information as set out herein;

7. I am aware that the findings of the Study will be anonymously processed into a research report, journal publications and/or conference proceedings and that my personal information will be aggregated and deidentified at such stage;
8. I also give the UFS permission to share, without notification, the collected data with other researchers at the UFS or other Higher Education Institutions. This permission is dependent on the same principles of ethical research practices, anonymity/confidentiality, safekeeping of information, and other issues listed above applying.

I, the Participant, agree to the recording of the

Full Name of Participant: __Patrick Dzimiri_____

Signature of Participant: ___  Date: ___05-05-22_____

Full Name(s) of Researcher(s): _____

ANNEXURE THREE

Interview Schedule

Introducing:
Greet participant to try to establish rapport with respondent.

Age (in years)
25-35, 40-50, 55-65, 65+
The number of years working at the mine…….
Gender:
Marital Status:
Nationality: Migrant/Local Worker?

My name is Patrick Dzimiri and I am a Development Studies Doctoral candidate at the Free State University I am conducting an academic study on: ***Sustaining Livelihoods in Post-Mine Closures: A Phenomenological Study of Former-Mineworkers atThsikondeni Mine in Limpopo Province, SouthAfrica.*** It is my hope that the answers you will provide me with will help me in understanding your experiences and coping mechanisms and resilient strategies following your job loss at the Thsikondeni Coal mine. As per the information sheet already shared with you by the research assistants, participation in this interview remains voluntary and confidential. Should you feel uncomfortable continuing with the interview at any point, you are free to withdraw and there will be no consequences. The interview will take approximately 1 hour 20 minutes of your time

Thank you for agreeing to take part in this interview with me and you have agreed to have our conversation recorded. Before we start with the interview, please read the informed consent form and sign it for me as evidence that you have agreed to participate without coercion

<u>Phase 1:</u>
Question 1 (20 min): Tell us the story of being employed at a mine *(Briefly explain how you initially got a mining job, how long you worked in mining, when did you lose the mining job and how you lost that job? What were the consequences for you and your family after losing this mining job?*
Answer these questions by making a trying to allocate time frames to the main activities.
Question 2 (40 min): Tell us your story after losing your job at a mine (*Did you apply for other jobs? (Discuss the various applications and levels of success). How easy was it to find another job? What various activities did you undertake to provide? How*

successful have you been in finding an alternative livelihood after your mining job? How easy or difficult was it to make a living after mining?)
Answer these questions by trying to allocate time frames to the main activities.

Phase 2:
All interviews will be transcribed and follow-up questions will be clarified with the participants
Questions (20 min):

1. How prepared were you to make a living after mining?
2. What helped you to make a living after mining?
3. What skills did you not have to make a living after mining
4. Document the following:
    - The age of the worker
    - Where the interview was conducted
    - Gender
    - Is the person married?
    - Is there evidence of having been or still is a migrant worker?

TSHIVENDA TRANSLATION
Luṱa 1:
Mbudziso 1 (minethe ya 20): Kha vha ri vhudze tshiṱori tshavho tsha u tholiwa mugodini. (Nga u pfufhifhadza kha vha ṱalutshedze uri mathomoni vho wanisa hani mushumo wa mugodini, vho shuma tshifhinga tshi ngafhani mugodini, ndi lini he vha fhelelwa nga mushumo wa mugodini na zwauri vho fhelelwa hani nga mushumo uyo? Masiandoitwa kha vhone na kha muṱa wavho musi vho fhelelwa nga mushumo wa mugodini?
Kha vha fhindule mbudziso idzi vha lingedze u dzhenisa zwifhingatiwa kha mishumo mihulwane.

Mbudziso 2 (minethe ya 40): Kha vha ri vhudze tshiṱori tshavho musi vho fhelelwa nga mushumo wavho mugodini (Vho ita khumbelo ya miṅwe mishumo? (Kha vha ṱalutshedze khumbelo dzo fhambanaho na maino a vhukoni). Zwo vha zwo leluwa nga nḓilaḓe u wana muṅwe mushumo? Ndi mishumo yo fhambanaho ifhio ye vha fulufhedzisa u i ṋetshedza? Vho zwi swikela nga nḓilaḓe u wana iṅwe nḓila ya u tshila nga murahu ha mushumo wavho wa mugodini. Zwo vha na vhukonḓi kana u leluwa u swika ngafhi u kona u tshila nga murahu ha zwa maini?

Kha vha fhindule mbudziso idzi nga u lingedza u dzhenisa zwifhingatiwa kha mishumo mihulwane.

Luta 2:
Inthaviyu dzoṱhe dzi ḓo ṅwalwa fhasi, mbudziso dza thevhelelo dzi ḓo ṱalutshedzwa vhadzheneli.
Mbudziso (minethe ya 20):

5. Vho vha vho lugela zwi ngafhani u kona u tshila nga murahu ha zwa maini?
6. Vho thuswa nga mini u ri vha kone u tshila nga murahu ha zwa maina?
7. Ndi vhukoni vhufhio vha sinaho u itela u tshila nga murahu ha zwa maina
8. Kha vha ṅwale zwi tevhelaho:
    - Vhukale ha mushumi
    - He inthaviyu ya itwa hone
    - Mbehu

- Muthu uyo o mala kana o malwa?
- Hu na vhuṱanzi ha u vha mushumela mashangoḓavha kana ha u vha u tshi kha ḓi vha mushumela mashangoḓavha?

Luṱa 2:

Inthaviyu dzoṱhe dzi ḓo ṅwalwa fhasi, mbudziso dza thevhelelo dzi ḓo ṱalutshedzwa vhadzheneli.

Mbudziso (minethe ya 20):

9. Vho vha vho lugela zwi ngafhani u kona u tshila nga murahu ha zwa maini?
10. Vho thuswa nga mini u ri vha kone u tshila nga murahu ha zwa maina?
11. Ndi vhukoni vhufhio vha sinaho u itela u tshila nga murahu ha zwa maina
12. Kha vha ṅwale zwi tevhelaho:
    - Vhukale ha mushumi
    - He inthaviyu ya itwa hone
    - Mbehu
    - Muthu uyo o mala kana o malwa?
    - Hu na vhuṱanzi ha u vha mushumela mashangoḓavha kana ha u vha u tshi kha ḓi vha mushumela mashangoḓavha?

XITSONGA TRANSLATION

Xiyenge xa 1:

Xivutiso 1 (timinete ta 20): Hi byeli hi ta loko uta va u thoriwile mugodini *(Hi ku komisa, hi byeli leswaku ntirho wale mugodini uwu kumise ku yini, leswaku u tirhile nkarhi wo tani hi kwihi mugodini, leswaku ntirho wale mugodinini wu herile rini naswona wu herise ku yni? Xana ku lahlekeriwa ka wena hi ntirho swi vile ni swiphiqo swihi eka wen ana muti wa wena?*

Hlamula swivutiso leswi uri karhi u kongomisa eka minkarhi ya leswi humeleleke.

Xivutiso 2 (timinete ta40): Hi byeli hita vutomi bya wena endzhaku kaku lahlekeriwa hi ntarho emugodini (*Xana u lavile mintirho kun'wanyana? (Xana unga hi byela hi mintirho yo hambana-hambana leyi uyi laveke na hi ta ku humelela kumbe ku pfumaleka ka humelela eka swona). Xana a swi olovile ku fikela kwihi ku kuma ntirho wun'wana? Xana u endlile yini ku kota ku hletela ndyangu wa wena? Xana u swi kotile hakunene-nene ku kuma tindlela tin'wana ta ku tlhogomela ndyangu wa wena endzhaku ka loko ntirho wale mugodini wu herile? Xana a swi olovile kumbe aswi tika njhani ku tihanyisa endzhaku kaku lahlekeriwa hi ntirho wale mugodini?*

Hlamula swivutiso leswi uri karhi u kongomisa eka minkarhi ya leswi humeleleke.

Xiyenge xa 2:

Ku bula-burisana hinkwako kuta hundzuluxeriwa eka ririmi ra xinghezi nakona loko kuri na swivutiso swo landzelela, swi ta hlamuseriwa hi vuenti.

Swivutiso (timinete ta 20):

13. Xana a wu tiyimiserile ku kota ku tihanyisa endzhaku ka ntirho wale mugodini?
14. Xana u pfunekile hi ndlela yihi ku kota ku tihletela endzhaku ka loko ntirho wale mugodini wu herile?
15. Xana u kumekile u ri karhi uri hava swilaveko swihi swo kota ku tihanyisa endzhaku ka ntirho wale mugodini
16. Tsala leswi landzelaka:
    - Malembe ya mutirhi
    - Laha mbula-vurisano wu humeleleke kona
    - Rimbewu
    - Xana munhu loyi a khumbhekaka u tekile kumbe ku tekiwa?

- Xana kuna leswi swi nga kombiwaka leswi kombisaka leswaku munhu loyi u tshama a tirha exilungwini?

ANNEXURE FOUR: LANGUAGE EDITING CERTIFICATE

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30 December 2023

LANGUAGE EDITING CERTIFICATE

To whom it may concern

I write to confirm that I have proofread and edited the following **Dissertation** using Windows 'Tracking' System to reflect my comments and suggested corrections for the author(s) to action:

Sustaining Livelihoods in Post-Mine Closure Contexts: A Phenomenological Study of Former Mineworkers at Tshikondeni Mine in Limpopo Province, South Africa

Author:	Patrick Dzimiri
Student No:	2017332525
Affiliation:	University of Free State

Although the greatest care was taken in editing this document, the final responsibility for the product rests with the author(s).

Sincerely

30.12.2023

SIGNATURE

This certificate confirms the language editing I have done in my personal capacity and not on behalf of SPU