

Mining **Future Skills**



MINING QUALIFICATIONS AUTHORITY

FINAL REPORT

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FOR

**STUDY ON SKILLS DEVELOPMENT AND RELATED MATTERS WITHIN
THE SUBSECTORS OF THE MINING AND MINERAL SECTOR (MMS): A
CASE STUDY OF THE NORTHERN CAPE PROVINCE**

Prepared by: Wits Mining Institute

EXECUTIVE SUMMARY

Introduction and Background

The Mining Qualifications Authority (MQA), as a Sector Education and Training Authority (SETA) for the mining and minerals sector (MMS), plays a crucial role in skills development and training. It ensures that both the workforce and communities are equipped with the necessary skills and competencies to meet the current and future needs of the sector. This is achieved through the implementation of various programmes underpinned by the skills demands of the MMS. Central to this is skills planning that integrates local community needs, to ensure that training programmes are tailored to the socioeconomic contexts as well as opportunities found in specific geographical areas. It is in line with these imperatives that the MQA initiated a study to provide insights into the specific mining and mineral sector related skills development needs in mining communities. By identifying the skills needed by communities, the study will help inform strategies that will lead to the implementation of targeted training programmes needed to address the skills gaps in communities.

Study Aim and Objectives

The aim of the study is to provide insights into the specific MMS-related skills development needs in mining communities in the Northern Cape province taking into account its unique economic landscape, minerals resources endowments, and their sectoral challenges. This aim is supported by several objectives, including an assessment of policies, legislation, and strategies that support skills development, as well as an analysis of the socioeconomic landscape of the province. Additionally, the objectives encompass establishing the status of the MMS in the province, highlighting its performance and contribution to the provincial economy. Identifying mining-related skills shortages and assessing skills development and training programs are also key objectives of the study.

Approach to the Study

The study was conducted using a mixed-methods approach comprising literature review, community surveys (a total of 506 surveys completed), community engagements, and key informant interviews. Through the application of these methods, insights were obtained into the socioeconomic context of mining-affected communities, current skills development

challenges, and stakeholder perspectives on the effectiveness of existing training interventions and workforce development initiatives.

Key Findings and Insights

The key findings from the study are outlined below.

- The provincial sample is youth dominated but formal education attainment is low with only 36% holding matric and only 10% have post-school qualifications. Foundational gaps are most acute in Namakwa and Pixley ka Seme. School subject choices are skewed toward humanities and life sciences where Mathematical Literacy exceeds Mathematics, limiting access to STEM and engineering pathways. Learners cite difficulty with mathematics, weak pedagogy, insufficient support, and limited career guidance as primary deterrents.
- Unemployment is high with full-time employment modest and self-employment small. Employment concentrates in general government services and mining while and while social grants are the largest income source signalling vulnerability and limited private-sector absorption beyond mining. Pixley ka Seme and Namakwa show the toughest labour-market conditions.
- Across districts, agriculture, construction, and renewable energy emerged as top opportunity sectors (with Mining a core employer among the participants). This alignment appears in ZF Mgcawu, Frances Baard, Namakwa, John Taolo Gaetsewe, and Pixley ka Seme, where the three sectors have been identified to offer opportunities.
- Communities have identified mining engineering, electrical engineering, boiler making, OHS and mechanical engineering (9%) as key skills needed to support for meaningful participation in the MMS in the province.
- Youth recorded technical skills as their top need, followed by leadership, soft skills and Entrepreneurship. District emphases differ with John Taolo Gaetsewe leaning most to technical training, Namakwa to leadership, Pixley ka Seme to soft skills, and ZF Mgcawu to entrepreneurship.
- Familiarity with Fourth Industrial Revolution (4IR) technologies and mining automation is comparatively low among community members, indicating limited

readiness for digitally driven changes in the mining sector. In contrast, awareness of renewable energy is significantly higher, suggesting greater exposure to or engagement with energy-transition initiatives.

- The key skills needed to leverage opportunities in renewable energy projects are solar installation, maintenance, battery systems, and supporting health and safety and project coordination skills.
- In addition, the following skills were identified as being crucial to widen participation in different economic sectors in the province - health and safety, project management and digital skills, as well as leadership and supervision, equipment maintenance and financial management.
- A majority perceive small-business opportunities, clustering in retail, services agriculture as the sectors offering most opportunities. Several challenges were noted as affecting small businesses in the province and these include lack of capital, business skills, market access, limited mentorship, and regulatory hurdles. Communities identified business skills, financial management, and marketing as the most needed by entrepreneurs
- When asked where initiatives should concentrate, participants highlighted the need to direct focus towards preparing youth for mining careers, upskilling current mining workers, and supporting local businesses that serve mining.
- In terms of training, only a small percentage was aware of mining related programmes. Access to training is perceived as difficult/very difficult, with lack of information, age restriction, and distance to training facilities identified as main barriers.
- Most community members were not familiar with the MQA and so they call for better communication about training opportunities, more programme variety, stronger job-market alignment, and an easier application process.
- Across both participant groups, there is clear agreement that the province faces a systemic mismatch between local skills supply and industry demand. Limited access to accredited training institutions, artisan development facilities, and trade test centres constrains the ability of residents to enter or progress within mining and related sectors. This results in continued reliance on skills sourced from outside the province, while local unemployment remains high. These findings align with concerns

raised in national and provincial skills planning frameworks, including the National Skills Development Strategy (NSDS III), which emphasises the need to expand access to occupationally directed training in under-serviced regions.

- Both community representatives and key informants highlighted the existence of a skills pipeline bottleneck, particularly for unemployed youth. While demand exists for semi-skilled and artisanal roles, pathways from school completion to workplace readiness remain fragmented. The lack of practical training exposure, combined with experience requirements imposed by industry, creates a cycle that excludes first-time entrants to the labour market. This challenge reflects broader policy concerns articulated in the White Paper for Post-School Education and Training, which identifies weak school-to-work transitions and limited work-integrated learning opportunities as persistent structural constraints.
- There is strong convergence around the need to adapt skills development to changing industry dynamics. Mining remains central to the provincial economy, but automation, digitalisation, and the parallel growth of renewable energy infrastructure are reshaping occupational requirements. Both groups noted that technical, electrical, and digitally enabled skills are increasingly essential, yet current training offerings have not fully aligned with these shifts. This mirrors national policy emphasis on preparing the workforce for technological change and the green economy, including priorities outlined in sectoral skills plans and energy transition frameworks.
- Participants from both perspectives underscored that economic participation extends beyond employment, particularly through local procurement and enterprise development. However, community-based SMMEs face persistent barriers related to access to capital, equipment, and technical capacity, limiting their ability to scale into higher-value segments of mining and infrastructure supply chains. These challenges echo policy objectives within the Mineral and Petroleum Resources Development Act (MPRDA) and Social and Labour Plan (SLP) framework, which emphasise local economic development and supplier development in mining-affected communities.
- Social and economic vulnerability emerged as a cross-cutting constraint. Field workers emphasised the role of poverty, youth disengagement, and limited access to post-

school education, while key informants pointed to affordability constraints and insufficient funding mechanisms for community-based training. Together, these factors reduce the accessibility and effectiveness of skills development initiatives for those most in need, reinforcing concerns raised in provincial socioeconomic and labour market analyses.

- Finally, both data sources converge on the importance of long-term, coordinated planning. Strengthening early skills pipelines, improving collaboration between industry, training providers, and schools, and ensuring oversight and accountability within the training ecosystem were consistently identified as critical to building a more inclusive, resilient, and future-oriented provincial workforce. This aligns with the intended coordinating role of SETAs, including the MQA, as articulated in national skills governance and quality assurance frameworks.

Priority areas for skills development and training

Against these findings, the following have been identified as priority areas for skills development and training in the Northern Cape.

- Strengthening foundational education and STEM readiness – there is a need to address high rates of non-matriculation, weak maths/science performance, and limited STEM subject uptake to open pathways into engineering, artisanal, and digital careers.
- Expanding technical, artisanal, and engineering training capacity – there is a need to increase access to accredited training, artisan development, WIL pathways, and trade testing especially aligned to mining, energy, construction, and agri-processing.
- Aligning training programmes to technological change – there is a need to develop training for automation, digitalisation, and 4IR-related capabilities while expanding renewable-energy skill sets such as solar installation, battery systems, and energy safety.
- Improving access, awareness, and navigability of training programmes – there is a need to address the province’s low awareness levels, high access barriers to ensure inclusive participation in training programmes.

- Supporting enterprise and supplier development capabilities - strengthening business skills, financial management, and technical capacity within SMMEs to enable participation in mining and infrastructure supply chains.
- Strengthening system coordination and accountability – there is a need to enhance collaboration across SETAs, TVETs, industry, and municipalities; integrate skills planning into local development frameworks; and improve programme monitoring

Recommendations

The following recommendations are based on the key findings of the study are as follows:

Recommendation 1: Increase visibility and communication in the province

The MQA should significantly strengthen its visibility and communication in the Northern Cape, as most communities are unfamiliar with its role or programmes. This requires district-level outreach, multilingual communication campaigns, and easy-to-access information channels such as WhatsApp, SMS, and community radio. Improving visibility is essential to close the awareness gap and ensure communities understand what training opportunities exist and how to access them.

Recommendation 2: Expand accredited training

The study identified a significant constraint in the Northern Cape relating to the limited availability of accredited artisan training providers and trade test centres, particularly in high-demand occupations such as diesel mechanics, plant fitting, welding, and electrical trades. Both field workers and key informants indicated that this gap restricts local skills development, delays certification, and increases training costs for employers, who are often required to send learners to other provinces for training and assessment. The absence of local accreditation capacity further limits opportunities for unemployed community members to access artisanal career pathways and contributes to the persistence of hard-to-fill vacancies within the province. In response to these challenges, it is recommended that the MQA initiate targeted interventions to expand accredited artisan training provision within the Northern Cape. This should include capacity-building support for potential training service providers to meet accreditation requirements, as well as engagement with relevant stakeholders to explore the establishment of local trade test centres.

Recommendation 3: Strengthening work-integrated learning (WIL) pathways

The study findings indicate that a key barrier to employment for unemployed youth and entry-level workers in the Northern Cape is the lack of practical workplace experience required to access mining and related sector jobs. Both field workers and key informants highlighted a persistent “experience gap”, where individuals complete theoretical training but are unable to secure employment or certification due to limited access to operational sites, machinery, or supervised practical exposure. This challenge is particularly acute for community members seeking progression from general labour into semi-skilled and artisanal roles. It is recommended that the MQA support the expansion of work-integrated learning (WIL), apprenticeships, and short accredited courses that provide practical exposure aligned to industry requirements

Recommendation 4: Need to align training programmes with emerging technologies

The study findings indicate that skills demand within the Northern Cape is shifting because of increased automation, digitalisation, and the expansion of renewable energy infrastructure. Key informants highlighted that several traditional mining roles are being transformed through the introduction of automated and remote-controlled systems, while community members noted growing demand for electrical, technical maintenance, and digitally enabled skills linked to solar and wind energy projects. Despite these shifts, current training provision has not fully adapted to reflect emerging occupational requirements, limiting workforce readiness and progression opportunities. It is recommended that the MQA strengthen the alignment between skills development initiatives and evolving industry needs by prioritising training that integrates digital literacy, computer-based competencies, and technical skills relevant to both mining and renewable energy sectors.

Recommendation 5: Strengthen the skills pipeline from schooling into post-school training

To strengthen the skills pipeline from schooling into post-school training, the MQA should promote STEM readiness and career guidance. Partnerships with schools, targeted maths and science bridging programmes, and tailored bursaries for high-demand fields such as mining engineering and electrical engineering would enhance progression pathways for youth, particularly those in districts with low matric and STEM uptake.

Recommendation 6: Support enterprise development in the province

Recognising the role of enterprise development in economic participation, the MQA should support mining-aligned SMMEs through enterprise-readiness training, financial-management support, and linkages to procurement opportunities in Social and Labour Plans. Training alone is insufficient; entrepreneurs also need capacity and access to markets to build viable businesses around mining supply chains.

Recommendation 7: Implementation of targeted occupational health and safety training in mining operations in the Northern Cape

The study findings indicate that occupational health and safety (OHS) skills gaps remain a critical concern within mining operations in the Northern Cape. Both field workers and key informants identified OHS as one of the most prominent cross-cutting skills gaps affecting a wide range of occupations, from general workers to supervisory roles. Inadequate OHS training poses risks to worker safety, operational efficiency, and regulatory compliance, particularly in a sector characterised by hazardous working environments. It is recommended that the MQA support the implementation of targeted OHS training programmes in collaboration with mining companies and accredited service providers. These programmes should focus on practical risk management, compliance with safety standards, and the development of a strong safety culture across mining operations.

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LIST OF ABBREVIATIONS AND ACRONYMS

Abbreviation/acronym	Description
ASM	Artisanal and Small-Scale Mining
CALS	Centre for Applied Legal Studies
CEDAR	Centre for Entrepreneurship Development and Research
CET	Community Education and Training
CETA	Construction Education and Training Authority
CFERI	Centre for Entrepreneurship Rapid Incubator
DDM	District Development Model
DMPR	Department of Mineral and Petroleum Resources
DMR	Department of Mineral Resources
DMRE	Department of Mineral Resources and Energy
DSBD	Department of Small Business Development
EE	Employment Equity
ETDP	Education and Training Authority
FASSET	Finance and Accounting Services Sector Education and Training Authority
GDP	Gross Domestic Product
HRD	Human Resources Development
ICT	Information and Communication Technology
IDP	Integrated Development Plan
IT	Information Technology
KMF	Kalahari Manganese Fields
LAP	Labour Activation Programme
LFPR	Labour Force Participation Rate
LGSETA	Local Government Sector Education and Training Authority
MerSETA	Manufacturing, Engineering and Related Services Sector Education and Training Authority

MHSA	Mine Health and Safety Act
MICT	Media, Information and Communication Technologies
MMS	Minerals and Mining Sector
MPRDA	Mineral and Petroleum Resource Development Act
MQA	Mining Qualifications Authority
NDP	National Development Plan
NOCCI	Northern Cape Chamber of Commerce and Industry
NSDP	National Skills Development Plan
PGDP	Provincial Growth and Development Plan
REE	Rare Earth Elements
SEDA	Small Enterprise Development Agency
SETA	Sector Education and Training Authority
SLP	Social and Labour Plan
SPU	Sol Plaatje University
STEM	Science, Technology, Engineering and Mathematics
TIPS	Trade and Industrial Policy Strategies
TPP	Talent Pipeline Programme
TVET	Technical and Vocational Education and Training
UIF	Unemployment Insurance Fund
UNISA	University of South Africa
USGS	United States Geological Survey

1. INTRODUCTION AND BACKGROUND TO THE STUDY

1.1. Introduction

The Mining Qualification Authority (MQA) has partnered with the Wits Mining Institute (WMI) to conduct a study that provides insights into skills development and related matters within the mining and minerals sectors (MMS) in the Northern Cape Province. By identifying the skills needed by communities in the province, the study will help inform strategies that will lead to the implementation of targeted training programmes needed to address the skills gaps in communities.

1.2. Background and Context

Skills development is important in fostering socioeconomic development. To this end, South Africa's National Development Plan (NDP) which aims to eliminate poverty and inequality by 2030 has marked the need to improve education, training and innovation as a strategic intervention area to achieve the country's development goals (National Planning Commission, 2012). This is because the country continues to struggle with high rates of unemployment which are closely linked to inadequate education and skill levels.

Education plays an important role in equipping working-age population with the skills and competencies required in the labour force. According to Department of Higher Education and Training (2022), it is concerning that 3.7 million adults in South Africa are still illiterate, despite improvements in education and training landscape. Adult illiteracy continues to hinder economic and social progress in the country. The direct consequence of low educational attainment in the country is skills shortages which impacts employability and the ability of working-age population to participate fully in the economy. The shortage of skills is a cross-cutting issue that affects key sectors of the economy, in particular those where technical skills are required such as Information and Communication Technology (ICT) and software development, engineering, construction and others (Tshwane University of Technology, 2023).

Addressing these challenges is important for South Africa to achieve its developmental objectives and improve overall socioeconomic landscape. The need for skills is urgent given the demands of future work necessitated by Fourth Industrial Revolution (4IR), automation,

and digitalisation. More so, the transition to the 'green economy' is transforming economic sectors, and subsequently the labour market increasing the demand for specialised skills.

The mining and minerals sector (MMS) is experiencing significant changes. According to the MQA (2023), the key change factors affecting the sector's performance and skills development include 4IR, geopolitics and market performance, mineral beneficiation, the impact of load-shedding, the integration of Environment Social Governance (ESG), natural crises and disasters, and illegal mining. These change drivers have various implications, including employment creation, upskilling of certain occupational levels, promotion of entrepreneurship skills, and potential job losses (MQA, 2023).

4IR comes with requirements of new skills sets to support the adoption and application of technologies in the MMS. On the other hand, global market demands necessitate high efficiency and productivity, and this translates into the need for a skilled workforce to leverage the opportunities across the global mining value chain. More so, the MMS is expected to play a considerable role in the just energy transition (JET), and this will have implication on skills where the adoption of green technologies will require reskilling, upskilling and side skilling of the current workforce and communities to ensure that they leverage the opportunities presented by JET both within the MMS and other economic sectors.

In view of the country's imperatives, and labour market demands, there is a need to turn the attention to skills development within communities. In its Sector Skills Plan (SSP) Update 2024/25 Report, the MQA reiterated the Mining Charter's focus on skills development and capacity building in the mining sector which *"requires mining companies to develop and implement meaningful programmes that address skills gaps, provide training opportunities for employees, and support the education and training of individuals in mining communities"* (MQA, 2023: 22). It is against this background that the study to understand skills development In Northern Cape province was initiated.

Mining is the largest sector in the Northern Cape province, contributing approximately 20% to the provincial economy (Minerals Council South Africa, 2023; Trade and Industrial Policy Strategy, 2024). Additionally, the province's economy is supported by other key sectors,

including manufacturing, agriculture, and construction. Overall, the provincial economy is projected to grow, with forecasts indicating a growth rate of 1.8% by 2026 (Northern Cape Provincial Government, 2024). This projected growth is driven by opportunities in renewable energy and mining, with the province hosting critical minerals such as manganese, zinc, and copper (Trade and Industrial Policy Strategy, 2024). These opportunities have significant implications for skills development, making it crucial to identify skills needs and gaps in the province to maximise the potential for socioeconomic development.

1.3. Problem Statement

The Northern Cape is amongst the provinces that are struggling with high unemployment rates. This is despite the province being the least populated in the country. As reported by Statistics South Africa (2022), unemployment rate increased from 27.4% in Q4:2024 to 29.5% in Q1:2025. During this period, 12,000 jobs were lost in the province (Statistics South Africa, 2025). The Labour Force Participation Rate (LFPR), which represents the percentage of the working-age population that is employed and/or economically active, stands at 57.5%, compared to the national LFPR of 60% (Statistics South Africa, 2025). This indicates a considerable portion of the working-age population in the Northern Cape is either unemployed or not actively participating in the labour market.

Among the factors contributing to high unemployment levels is the shortage of skills. There is an inadequate supply of qualified professionals with the necessary skills to meet labor market demands. The Premier of the province highlighted the difficulties in retaining qualified professionals, as they often prefer to work in larger provinces like Gauteng, Western Cape, and KwaZulu-Natal, which offer better salaries and employment conditions (South African Business, 2025). Human capital development remains a priority for the province to address the triple challenges of unemployment, poverty, and inequality. Therefore, a holistic approach to skills development is needed, considering the specific needs and circumstances of the province.

1.4. Aim and Objectives

The aim of the study is to identify and analyse the specific MMS-related skills development needs in the Northern Cape province, considering its unique economic landscape, mineral resource endowments, and sectoral priorities, socio-economic advancements, and its broader development goals. This aim is supported by the following objectives:

- 1) Analysing the effectiveness of current legislation, policies, and strategies driving skills development in the province.
- 2) Assessing the alignment of provincial frameworks with national strategies (including: DDMs).
- 3) Analysing the population demographics of the province (including age distribution, gender, and racial representation, educational attainment levels and skillsets of working-age population).
- 4) Establishing a detailed profile of the MMS in the province (including main mining commodities extracted and processed; size and composition of the existing workforce; types of companies operating in the sector including national, multinationals and small-scale miners).
- 5) Analysing the economic performance of the MMS compared to other sectors in the provincial economy.
- 6) Assessing its contribution to Gross Domestic Product (GDP), job creation, and revenue generation.
- 7) Identifying the existing mining-related occupational shortages (hard-to-fill vacancies) and skills gaps within the province and reasons thereof.
- 8) Identify the mismatches between the skills required by mining companies and the skills available in the community.
- 9) Assessing the adequacy and effectiveness of existing skills development programmes in addressing provincial needs.
- 10) Analysing the capacity offerings of technical colleges, universities, and industry-specific training providers in addressing the skills development in the province.
- 11) Identifying the common skills development needs of community members living near mining operations and beyond mining-specific jobs.

- 12) Analysing the demand for skills in related sectors such as agriculture, manufacturing, tourism, and service industries.
- 13) Assessing the need for entrepreneurial and business development skills for local economic empowerment.
- 14) Gathering insights on the community and companies' experiences in accessing skills development offerings from the MQA.
- 15) Exploring the potential synergies between skills development needs of the MMS for upskilling and reskilling existing workforce for diversification into other sectors.
- 16) Identifying potential partners and stakeholders relevant to addressing skills development needs in the province.

1.5. Significance of the Study

This study comes at an opportune time when the Department of Minerals and Petroleum Resources (DMPR) released the critical minerals and metals for the country (DMPR, 2025). The Northern Cape is expected to benefit from this strategy as it holds numerous critical minerals including zinc, copper, manganese and some rare earth elements (Creamer, 2025). According to the DMPR (2025: 15), *“The upstream and downstream value chain activities for critical minerals hold enormous opportunities for economic growth, industrial expansion, job creation, skills development, research, development and innovation (RDI) and recycling”*.

It is important for the province to develop the necessary skills to participate in the value chains of its critical minerals, especially among community members who often cannot engage in economic activities due to a shortage of skills. This study is essential as it will provide insights into the skills needs and gaps that exist in the province. By identifying these gaps, targeted programmes can be developed to enhance skills development enabling the Northern Cape province to leverage opportunities within and outside of the mining sector for its socioeconomic development.

2. LITERATURE AND POLICY REVIEW

2.1. Introduction

The chapter presents the literature and policy review. The chapter discusses the socioeconomic landscape of the Northern Cape province and provides an overview of the current state of the mining and minerals sector in the province. This discussion is followed by a skills analysis which provides insights on the province workforce composition and skills profiles, skills shortages and gaps and highlights key factors contributing to skills gaps in the province. The chapter also provides a landscape of education and training in the province and discusses skills development policies and initiatives seen in the province aimed at skills development and training.

2.2. Socioeconomic landscape of the province

2.2.1. Locality

The Northern Cape is the largest province by extent in South Africa. It takes up nearly a third of the country's land area covering an area of 372 889km² (Municipalities of South Africa, n.d). It shares borders with two countries, Namibia to the northwest and Botswana to the north. Locally, it shares borders with four provinces, namely, Western Cape, Eastern Cape, Free State and the North West province. The province has five (5) district municipalities and 26 local municipalities. As shown in figure 1, these district municipalities are Frances Baard, John Taolo Gaetsewe, Namakwa, Pixley ka Seme and ZF Mgcawu.



Figure 1: District and local municipalities in the Northern Cape province

(Source: Municipalities of South Africa, n.d)

2.2.2. Demographic profile

The Northern Cape is the least populated province in South Africa, with a population of 1.36 million people (Statistics South Africa, 2022). This makes up about 2.2% of South Africa's total population. Table 1 illustrates the province's population comparing 2001, 2011 and 2022. As seen on the table, the population increase by 37% between 2001 and 2022. Notably, in each of these years, the female population exceeded the male population. In 2022, females accounted for 51.8% of the total population, while males made up 48.2% (Statistics South Africa, 2022).

Table 1: Population by gender of the Northern Cape

Census year	Male	Female	Total
2001	479 764	512 112	991 876
2011	564 972	580 889	1 145 861
2022	653 320	702 626	1 355 945

(Source: Statistics South Africa, 2022)

Table 2 shows the population by district municipality. The largest share of the population resides in Frances Baard district municipality making up 32% of the total population. It is followed by ZF Mgcawu (21%) and John Taolo Gaetsewe (20%). The least populated district municipality is Namakwa with a 11% share of the population.

Table 2: Population by district municipality

District municipality	Population (2022)	% share
Frances Baard	434 343	32%
John Taolo Gaetsewe	272 454	20%
Namakwa	148 935	11%
Pixley ka Seme	216 589	16%
ZF Mgcawu	283 624	21%

(Source: Statistics South Africa, 2022)

In terms of racial representation, Black and Coloured groups account 50.1% and 41.6% respectively. The remainder of the population is made up of Whites (i.e., 7.3%) and Indian (i.e., 0.8%). Figure 2 disaggregates the population by age and gender. As the case in most provinces, the Northern Cape has a young population with a median age of 27 years (Source).

As seen on the figure, with the younger age groups (i.e., 0 to 29 years), a relatively small difference can be observed across gender with more males than females. Among individuals aged 30 years and older, there is a noticeable gender disparity, with females outnumbering males in these age groups.

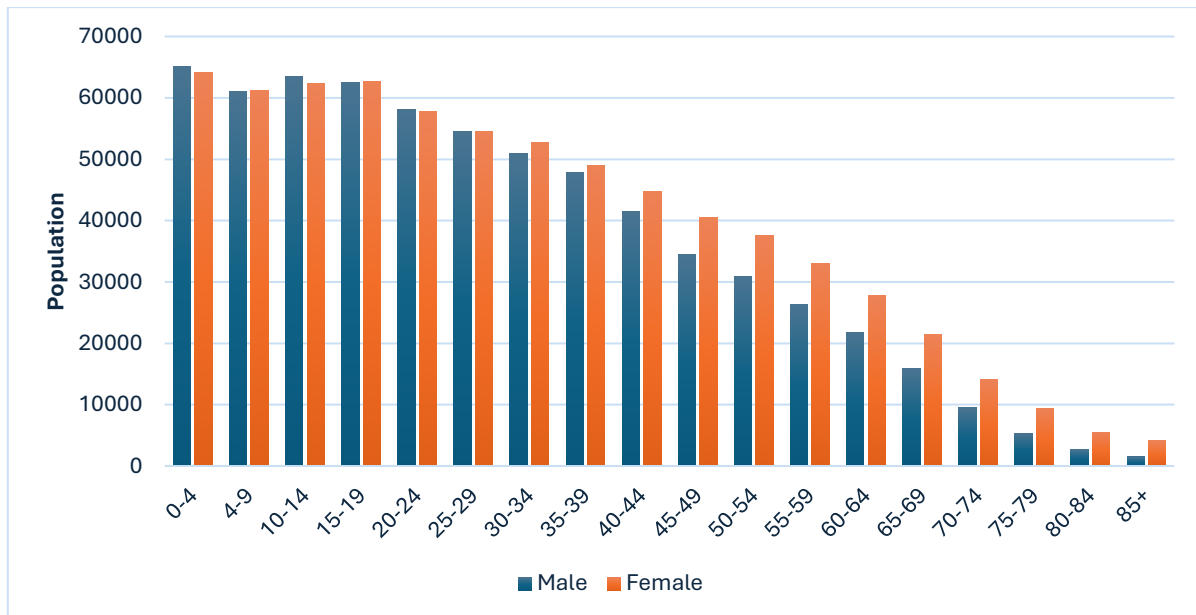


Figure 2: Population according to gender and age

(Source: Statistics South Africa, 2022)

2.2.3. Education profile

Figure 3 presents data on educational attainment among individuals aged 20 years and older in the Northern Cape, with comparisons across district municipalities. The data shows that 39% of the population have attained some secondary education, while 31% hold a matric qualification. A noticeable portion of the population has some primary schooling (11%), and 7% have no formal schooling. According to Statistics South Africa (2022), only 7.1% of the population have achieved post-school education, reflecting a slight decline from 7.2% in 2011—indicating a marginal regression over the period.

As shown in figure 3, the educational profile across the various district municipalities is closely aligned with the provincial profile, indicating consistent patterns in educational attainment throughout the province. In all district municipalities, most of the people have some secondary education as their higher educational attainment. This group is followed by those

with matric, with the highest percentage seen in Frances Baard (i.e., 34%), followed by John Taolo Gaetsewe (i.e., 31%) and ZF Mgcawu (i.e., 30%). The highest percentage of the people with no schooling (i.e., 10%) is in John Taolo Gaetsewe. More so, most people (i.e., 10%) with post-school education are in France Baard district municipality.

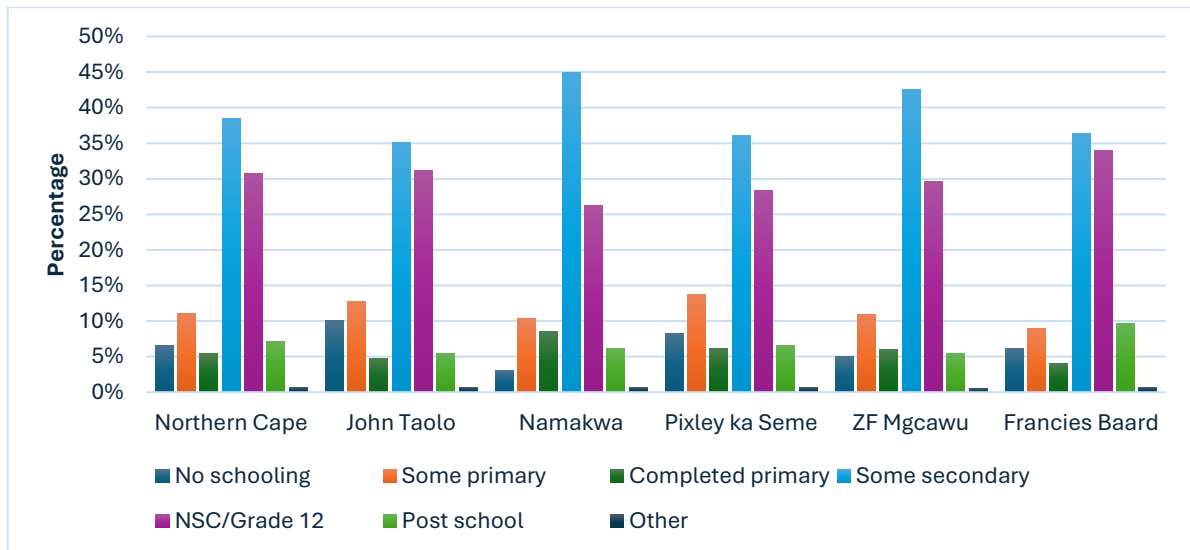


Figure 3: Education levels in the province

(Source: Northern Cape Provincial Government, 2024)

2.2.4. Type of households

Table 3 shows the distribution of population and average household size in the province and across the different district municipalities in 2011 and 2022. The Northern Cape had approximately 333,553 households in 2022, up from 301,400 in 2011. The largest number of households are in Frances Baard, followed by ZF Mgcawu and John Taolo Gaetsewe. According to Statistics South Africa (2022), the average household size increased from 3.8 in 2011 to 4.1 in 2022. The largest average household size was recorded in Namakwa, despite it being the least populated municipality in the province.

Pixley ka Seme and ZF Mgcawu reported identical household sizes, while John Taolo Gaetsewe matched the provincial average. Overall, the data reflects a general increase in household sizes across the province between 2011 and 2022. The average household size of the province is larger than the national average of 3.2 (Statistics South Africa, 2023). Household size has a bearing on skills development through several links. For example, larger households often face financial pressure that affect the ability of family members to access skills development

opportunities due to completing priorities within the family. To this end, household size can serve as an indicator for potential barriers to educational attainment, helping policymakers identify communities that may require targeted support.

Table 3: Distribution of population, households and average household size by district municipality, Census 2011-2022

Province/ District	2011			2022		
	Households	Population	Average household size	Households	Population	Average household size
Northern Cape	301 400	1 145 861	3.8	333 553	1 355 945	4.1
John Taolo Gaetsewe	61 328	224 799	3.7	66 347	272 454	4.1
Namakwa	33 856	115 842	3.4	33 947	148 935	4.4
Pixley ka Seme	49 191	186 351	3.8	53 737	216 589	4.0
ZF Mgcawu	61 097	236 783	3.9	70 433	283 624	4.0
Frances Baard	95 928	382 086	4.0	109 089	434 343	4.0

(Source: Statistics South Africa, 2022)

2.2.5. Economic landscape

Figure 4 shows the provincial contribution to the national GDP. The Northern Cape accounts for the smallest share of the country's GDP. In 2022, the province's contribution was 2.2% to the national GDP. This compares to 33.7% in Gauteng which is the largest portion amongst all provinces. It is followed by KwaZulu-Natal (i.e., 15.9%) and Western Cape (i.e., 13.9%) provinces.

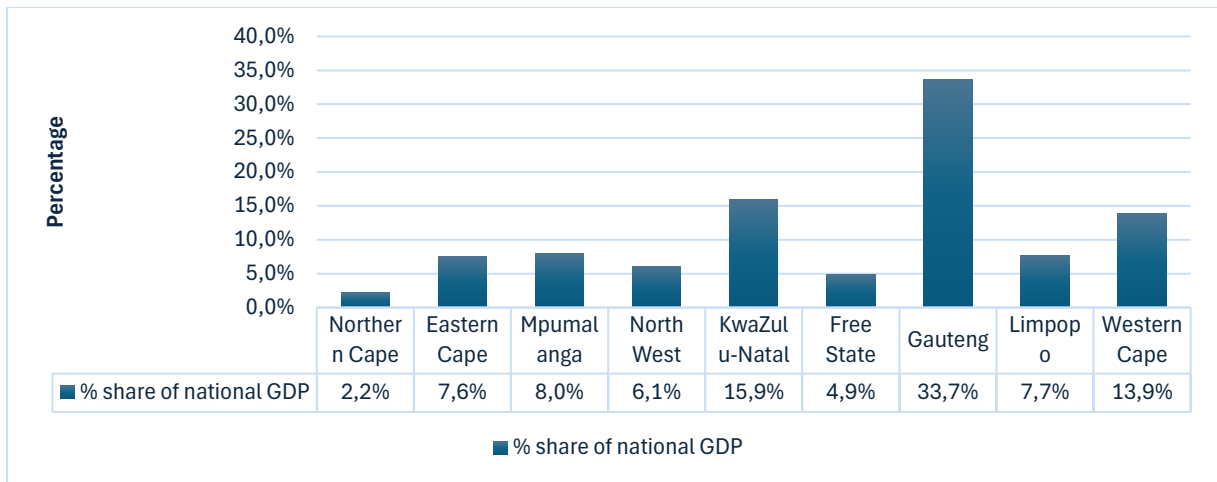


Figure 4: Provincial share of the national GDP

(Source: Northern Cape Provincial Government, 2024)

Figure 5 presents a comparison of GDP growth rates between the Northern Cape and South Africa from 2013 to 2022. The overall trend is broadly aligned, with both the provincial and national economies experiencing growth in most years. A notable exception is 2020, when both economies contracted sharply due to the impact of the COVID-19 pandemic. South Africa recorded a decline of 6.0%, while the Northern Cape contracted by 5.1%. This downturn was followed by a strong rebound in 2021, particularly in the Northern Cape, which resulted in a peak growth rate of 5.5%.

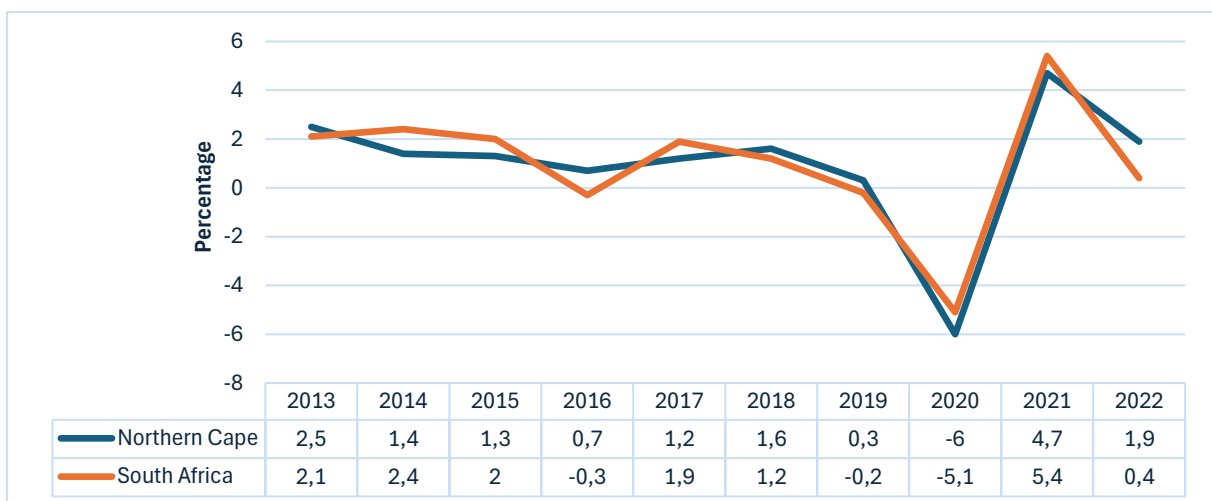


Figure 5: National and provincial GDP growth rates

(Source: Northern Cape Provincial Government, 2024)

According to the Trade and Industrial Policy Strategies (TIPS, 2024), the strong performance in 2021 was largely driven by a commodity boom, which significantly boosted the mining

sector—a key contributor to the province’s economy. However, this performance proved short-lived, as growth slowed again in 2022. A slight improvement was recorded in 2023 with growth rate reaching 2% in 2023 (TIPS, 2024).

Figure 6 shows the contribution to provincial GDP by district municipality in 2022. The largest share is constituted by Frances Baard (i.e., 35.2%), followed by ZF Mgcawu (i.e., 26.4%) and John Taolo Gaetsewe (i.e., 14.4%). The least contributor in Namakwa district municipality with a GDP share of 10.1%.

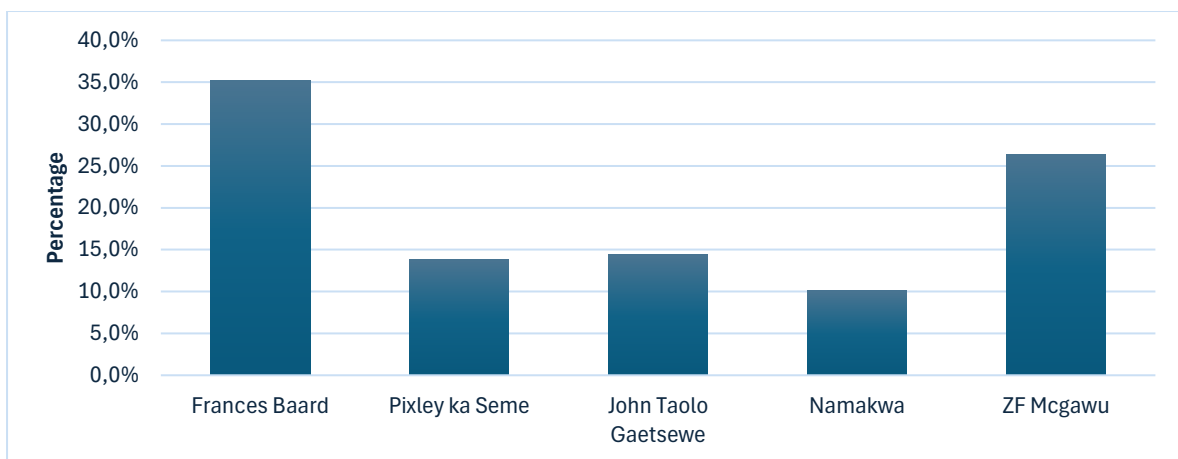


Figure 6: Percentage share of provincial GDP by district municipality

(Source: Northern Cape Provincial Government, 2024)

The economy of the Northern Cape is supported by several economic sectors. Figure 7 illustrates each sector’s contribution to the provincial GDP alongside their respective growth rates for 2022. The tertiary sector was the largest contributor, accounting for 60.5% of the provincial GDP. Within this sector, community services and finance were the leading subsectors, contributing 27.5% and 14%, respectively. The primary sector followed, making up 30.8% of the GDP, driven largely by mining at 22.4% and agriculture at 8.4%. The secondary sector contributed the smallest share, with manufacturing, electricity, and construction collectively accounting for 8.6% of the provincial GDP.

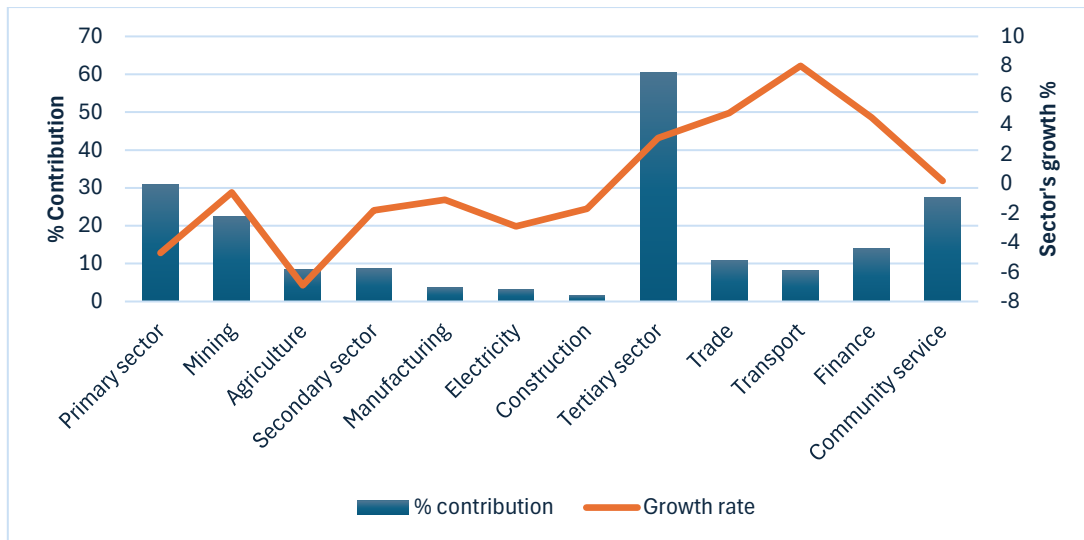


Figure 7: Sector's growth and contribution to provincial economy

(Source: Northern Cape Provincial Government, 2024; TIPS, 2024)

As noted, figure 7 also illustrates the sectoral growth rates for 2022. During this period, only the tertiary sector recorded positive growth, expanding by 3.1%. In contrast, the primary and secondary sectors contracted by 4.7% and 1.8%, respectively. Among the subsectors, transport emerged as the strongest performer with a growth rate of 8%, while agriculture experienced the sharpest decline at -6.9%. The mining sector reported the smallest contraction, declining by just 0.6%. Table 4 provides an overview of the key industries within each subsector. In the Northern Cape, the mining sector is primarily driven by iron ore, manganese, and diamond extraction. Within the agricultural subsector, livestock and horticulture are the dominant industries. Most construction activity in the province is concentrated in infrastructure development and renewable energy projects

Table 4: Sectors and key sub-sectors in the province

Sector	Key sub-sectors
Mining	Dominated by iron ore, manganese and diamonds
Agriculture	Livestock and horticulture
Manufacturing	Food processing, furniture and metal products
Construction	Infrastructure and renewable energy
Tertiary Sector	Trade, transport, finance, government services and education

The contribution of the different subsectors differs across district municipalities. Figure 8 shows the sector's contribution within the five district municipalities. As seen on the figure, the mining subsector is dominant in three municipalities, Namakwa, ZF Mgcawu and John Taolo Gaetsewe where it contributes 39.8%, 21.7% and 70.7% respectively. The community service also has considerable presence across all five municipalities with the largest share seen in Frances Baard (i.e., 36.8%) and Pixley ka Seme (i.e., 35.5%). The other dominant subsectors are finance and agriculture.

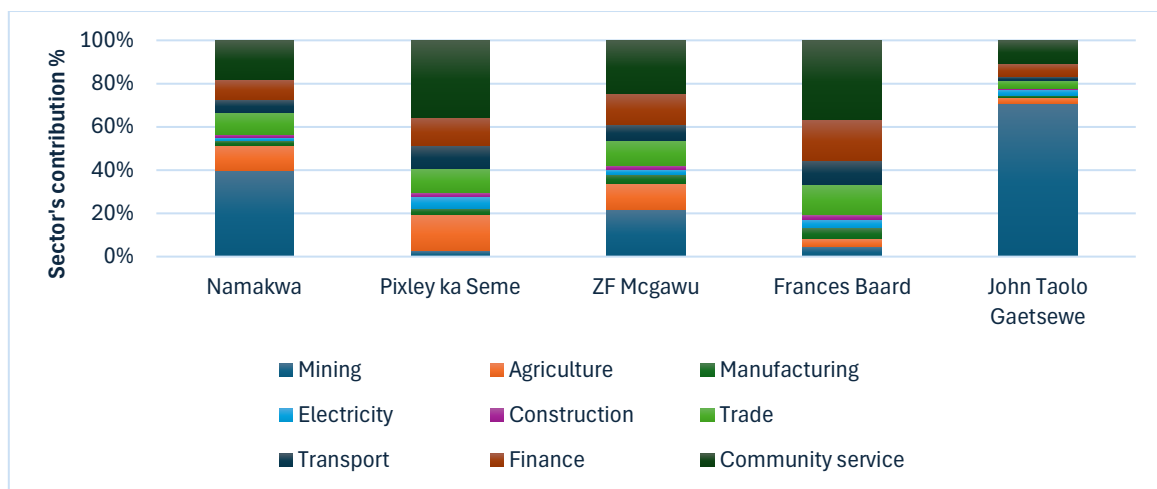


Figure 8: Sector contribution by district municipality

(Source: Northern Cape Provincial Government, 2024)

Overall, the top three contributing sectors in Frances Baard are mining, community services, and agriculture. In Pixley ka Seme, the leading sectors are community services, agriculture, and finance. For John Taolo Gaetsewe, the dominant sectors include community services, mining, and trade. In Namakwa, community services, finance, and trade are the primary contributors. Lastly, in ZF Mgcawu, the top sectors are mining, community services, and finance.

2.2.6. Labour market

Table 5 shows the characteristics of the working-age population in the province. Of the total population, 65.6% is of working age (Statistics South Africa, 2022). This equates to 844,000 people as recorded in the first quarter of 2025. Of this, 486,000 people are part of the labour force. As seen on the table, this decreased by 2,000 from 488,000 in the last quarter of 2024.

Within the available labour force, 343,000 people were employed in 2025Q1 – this compared to 355,000 in 2024Q4. This equates to a 3% decrease. During the same period, the number of people who are not working increased by 7% from 134,000 to 143,000.

Table 5: Characteristics of the working-age population

	2024Q4	2025Q1
Population (15-64 years)	843,000	844,000
Labour force	488,000	486,000
Employed	355,000	343,000
Unemployed	134,000	143,000
Not economically active	354,000	359,000
Discouraged work seekers	78,000	86,000
Other (not economically active)	277,000	273,000
Rates%		
Unemployment rate	27.4%	29.5%
Expanded unemployment rate	39.7%	43.0%
Absorption rate	42.1%	40.6%
Labour force participation rate	69.8%	71.1%

(Source: Statistics South Africa, 2022; 2025)

The percentage of the population that is characterised as not economically active also increased during this period. According to Statistics South Africa (2023a), there are two groups falling under this category, namely, discouraged work-seekers and other group (i.e., not economically active). Discouraged work seekers are described as *“individuals who are unemployed and willing to work but have not actively pursued employment due to factors such as a lack of job opportunities in their vicinity, inability to secure positions matching their skills, or a sense of despair about the prospect of finding any form of employment”* (Statistics South Africa, 2023a). The other cohort encompasses students, homemakers, individuals who are unwell or have disabilities and those that are either too young or too old to engage in work.

As captured on the table, discouraged work seekers in the province increased by 10% from 78,000 in 2024Q4 to 86,000 in 2025Q1. The other cohort decreased from 277,000 to 273,000 in the same period. The unemployment rate of the province was 29.5% in 2025Q1 – a regression from 27.4% in 2024Q4. There are two measures of unemployment in the country, that are the official and expanded unemployment rate. Official unemployment rate is the percentage of the working-age population that is available to work and is actively looking for employment. The expanded unemployment rate, on the other hand, is a broad measure of unemployment that considers those that have stopped looking for employment. The expanded unemployment rate of the province was sitting at 43.0% in 2025Q1.

The labour absorption rate, also known as the employment-to-population ratio, indicates the proportion of the working-age population that is employed. A higher absorption rate indicates that a larger percentage of the working-age population is employed. Conversely, a lower rate indicates that more individuals are struggling to find employment. A labour absorption rate of 40.6% means that only about four out of every ten people of working age are employed, highlighting a relatively low level of labour market participation and suggesting challenges with job creation in the province.

The Labour Force Participation Rate (LFPR), on the other hand, measures the percentage of working-age population that is employed or seeking employment. The province's LFPR was 71.7% in 2025Q1 – this compares to country's LFPR of 60%. This can be interpreted as his can be interpreted as a sign that a large proportion of the province's working-age population is willing and available to work. However, the gap between the LFPR and the labour absorption rate also points to a high level of unemployment, indicating that while many people are participating in the labour market, a substantial number are unable to secure jobs.

Figure 9 illustrates total employment and unemployment across the district municipalities. The highest unemployment rate is observed in Frances Baard, at 28.0%, followed by Namakwa and Pixley ka Seme, with rates of 25.8% and 25.1%, respectively. In contrast, the lowest unemployment rate is recorded in John Taolo Gaetsewe, at 19.5%, indicating relatively better labour market conditions in that district. The highest number of employed individuals is found in Namakwa, followed by John Taolo Gaetsewe. In terms of unemployment,

Namakwa and ZF Mgcawu record the largest numbers of unemployed people, indicating areas where job creation efforts may need to be increased.

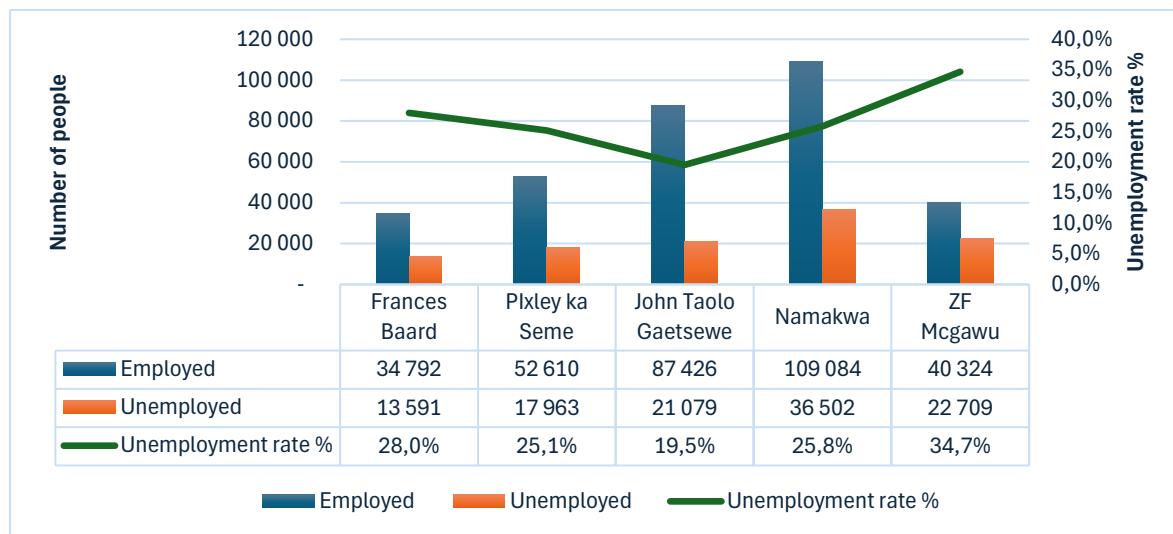


Figure 9: Total employment and unemployment across district municipality

(Source: Northern Cape Provincial Government, 2024)

Figure 10 shows employment by sector in the province. The largest employer is government services, accounting for 25% of total employment. This is followed by the trade sector at 16%, agriculture at 15%, and finance at 14%. On the other end of the spectrum, the utilities, manufacturing, and transport sectors contribute the least, collectively making up just 8% of total employment. The mining sector, despite its economic significance, accounts for 11% of employment, which translates to approximately 39,000 jobs.

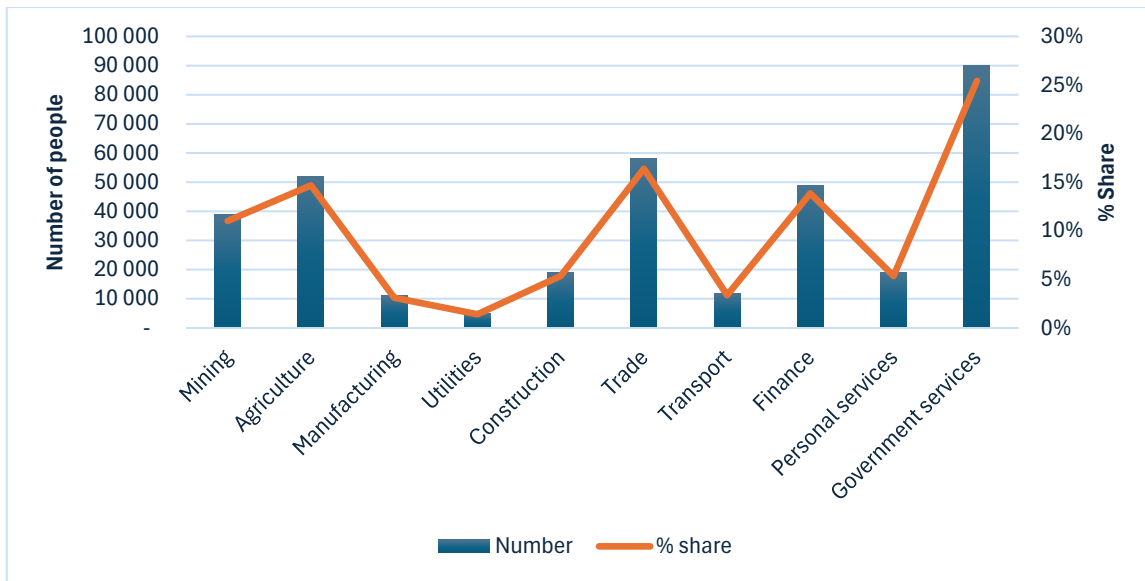


Figure 10: Total employment by economic sector

(Source: Northern Cape Provincial Government, 2024)

2.3. State of the mining and minerals sector in the province

2.3.1. Mineral endowment

The Northern Cape is one of South Africa’s leading mining provinces, with mining contributing between 20% and 30% to the provincial economy (Minerals Council South Africa, 2023). The province is endowed with substantial deposits of key minerals. According to the Council for Geoscience (2022), it is recognised as a local hub for technology minerals that are critical to meeting global demand including zinc, nickel, lead, copper, and cobalt. These minerals are essential components in the manufacturing of smartphones, electric vehicles, and renewable energy systems.

In addition to these, the province also hosts significant reserves of iron ore, manganese, diamonds, titanium, and other minerals. Figure 11 illustrates the mineral distribution across the province. As can be seen in the figure, the Northern Cape is rich in semi-precious stones (gemstones) such as tiger’s eye, jasper, quartz, emerald, malachite, and tourmaline. The province also contains large deposits of industrial minerals. These are non-metallic and non-fuel resources valued for their physical and chemical properties (American Geoscience Institute, 2025). Figure 12 shows the specific industrial minerals found in the province including andalusite, limestone, gypsum, salt, feldspar, stone and aggregate and others.

Several of the minerals found in the province are classified as critical minerals. Additional information on these is provided below.

Table 6: Critical minerals found in the Northern Cape province

Minerals	Description and key details
Iron ore	Iron is a critical raw material in steel production, and South Africa possesses substantial iron ore reserves. As of 2023, the country accounted for 0.8% of global iron ore reserves. Its production reached 63.1 million tonnes, representing 2.5% of global output. According to the Department of Mineral Resources and Energy (2023), this places South Africa among the top ten iron ore producers globally. The majority of these deposits are in the Northern Cape, particularly around Postmasburg and Sishen (Department of Mineral Resources, 2008a; 2014). As the country’s leading iron ore-producing province, the Northern Cape is expected to continue playing a central role in supporting both domestic steel manufacturing and international export markets.
Manganese	Manganese is primarily used as an alloying agent in steel production. South Africa remains the world’s leading producer and exporter of manganese. As of 2023, the country’s manganese reserves were estimated at 600 million tonnes. Globally, manganese reserves stood at 1,900 million tonnes, with South Africa accounting for 31.5%, of the total reserves. Global manganese ore production reached 32.5 million tonnes in 2023 — a 24.3% increase compared to 2022 (Department of Mineral Resources and Energy, 2023). South Africa contributed the largest share at 58.35%, followed by Australia (9.21%). Over 90% of South Africa’s manganese reserves are in the Kalahari Manganese Fields (KMF) in the Northern Cape, making the province a strategic hub for global manganese supply (Department of Minerals and Energy, 2008a; 2013).
Copper	Copper has a wide range of applications, including in jewellery making, electrical and electronic components. As a critical mineral, copper is expected to play a vital role in the global transition to clean energy technologies. It is a key component in renewable energy systems, electric vehicles, and power infrastructure. According to the DMRE (2023), South Africa’s copper reserves are estimated at 10 million tonnes. In 2023, the country produced 50kt of copper, of which 43kt was exported. Copper deposits in the country are primarily located in the Northern Cape, particularly in the Okiep Copper District and surrounding areas. Other notable occurrences include deposits in the Limpopo and North West provinces. These provinces continue to

Minerals	Description and key details
	contribute to the country's copper production and have been earmarked for future exploration and development.
Zinc	Zinc compounds are used in rubber, paints, pharmaceuticals, electronics, agriculture, and medicine, among other applications. South Africa hosts an estimated 6.2Mt of zinc reserves, constituting 2.8% of global total. The country's zinc production was 198 kt in 2023. Lead and zinc deposits associated with copper are found in the Northern Cape, near Aggeneys (DMRE, 2023).
Cobalt	Cobalt is widely used in battery manufacturing, particularly in lithium-ion batteries that power electric vehicles, smartphones, laptops, and other portable electronic devices. As a critical mineral, cobalt plays a key role in the global shift toward clean energy and sustainable technologies. In 2023, South Africa's cobalt production was 378 tonnes – compared to 250 tonnes in 2022. The USGS estimates South Africa's cobalt reserves at 15 kt. According to the Department of Mineral Resources and Energy (2023), cobalt, along with copper and nickel, is primarily produced as a by-product of platinum mining in the Bushveld Complex. Occurrences of cobalt are also found in the Northern Cape, although these are less developed compared to those in the Bushveld Igneous Complex (Department of Mineral Resources, 2011). The province holds potential for future exploration, particularly in areas where cobalt is associated with copper and manganese mineralisation.
Nickel	Nickel finds use in many applications including the manufacture of industrial and consumer products such as stainless steel, magnets, and alloys (Department of Mineral Resources, 2009). South Africa's production was 30 kt in 2023, compared with 29 kt in 2022. Global primary nickel production reached 3,36Mt in 2023. In South Africa, nickel is produced as a by-product in PGM mining in the North West and Limpopo provinces. Nickel deposits are also found in Mpumalanga and the Northern Cape provinces offering further potential for exploration and development.
Rare earths minerals	Rare earth elements (REEs) are used in many industries including electronics and renewable energy (Steenkampskraal Monazite Mine, 2025). South Africa is considered an emerging producer of REEs, with known deposits located in several regions, including the Western Cape, Limpopo, and the Northern Cape. These deposits contain various REEs such as neodymium, praseodymium, and dysprosium, which are critical for the production of permanent magnets used in wind turbines, electric vehicles, and other high-technology applications.

Minerals	Description and key details
Titanium	<p>South Africa is well endowed with non-ferrous minerals, particularly titanium and zirconium, which are primarily found in heavy mineral sands along the country's coastal provinces. These sands are a major source of ilmenite, rutile, and zircon (Department of Mineral Resources, 2008). These key minerals are used in the production of titanium dioxide pigments, ceramics, and refractory materials. In addition to coastal deposits, traces of titanium are also found in hard rock formations in the Northern Cape, indicating further potential for inland exploration and development. In 2023, global titanium mineral (ilmenite and rutile) reserves were estimated at 755 million tonnes. South Africa, with an estimated 34.1 million tonnes, accounted for approximately 4.5% of global reserves, underscoring its strategic position in the global supply of titanium-bearing minerals (Department of Mineral Resources and Energy, 2023).</p>
Phosphate	<p>Phosphate has diverse applications across agriculture, industry, and even within the human body as a vital nutrient. Its primary use is in agriculture, where it is a key component in the production of fertilizers that enhance crop productivity (Department of Mineral Resources, 2012). In 2023, South Africa produced approximately 1,744 kt of phosphate rock. Phosphate deposits in South Africa are primarily located in the Phalaborwa Complex in Limpopo Province, which hosts one of the country's largest and most well-known phosphate reserves. Additional occurrences have been identified in the Western Cape, North West, and Northern Cape provinces. These deposits are of strategic importance for supporting domestic fertilizer production and reducing reliance on imports.</p>
Fluorspar	<p>Fluorspar, also known as fluorite, is used in many applications including the manufacture of products such as aluminium, gasoline, insulating foams, refrigerants, steel, and uranium fuel (National Minerals Information Centre, n.d). In South Africa, the largest known deposits of fluorspar are located within the Bushveld Igneous Complex in the North West Province. Additional occurrences of fluorspar mineralisation have also been identified in other regions, including parts of Limpopo and the Northern Cape (Department of Mineral Resources, 2009). South Africa's production was 451 kt in 2023. This equated to 5% of the global fluorspar production (Department of Minerals and Energy, 2023).</p>
Lithium	<p>Lithium has a wide range of industrial applications including the production of lubricants, alloys, glass, and ceramics. In recent years, its application in the manufacture of rechargeable batteries has gained</p>

Minerals	Description and key details
	global attention. In South Africa, lithium is mined in Port Shepstone in the KwaZulu-Natal Province (Department of Mineral Resources and Energy, 2023). Potential deposits identified in the Northern Cape Province, positioning the province as a potential contributor to the global lithium supply chain.

Northern Cape Province Mineral Map



Council for Geoscience

Commodities

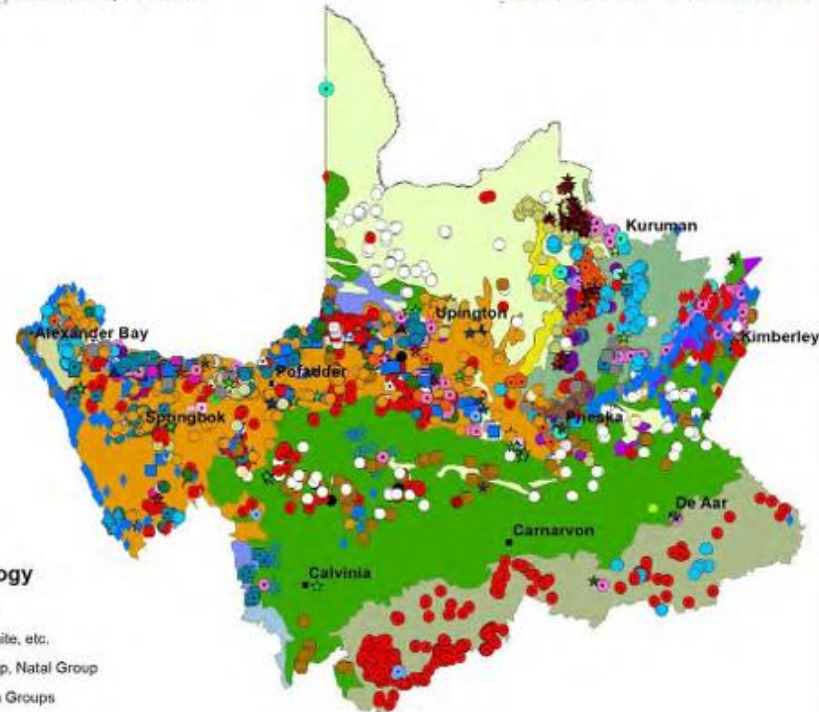
- | | | |
|---------------------------|-----------------------------|--------------------------|
| ▲ Alum | ● Dumortierite | □ Phosphate |
| ★ Amazonite (Gemstone) | ● Emerald (Gemstone) | ● Pyrope (Gemstone) |
| ● Amethyst (Gemstone) | ● Feldspar | ● Rare Earths |
| ● Andalusite | ● Fluorspar | ● Rose Quartz (Gemstone) |
| ● Apatite (Gemstone) | □ Glass Sand (Silica) | ○ Salt |
| ● Arsenic | ● Gypsum | ● Silimanite |
| ● Barytes | ☆ Iceland Spar | ● Silver |
| ● Beryllium | ▲ Ilmenite (Heavy Minerals) | ● Stone Aggregate/Gravel |
| ● Bismuth | ● Iron | ▲ Sulphur |
| ● Building Sand (Silica) | ● Jasper (Gemstone) | ★ Talc |
| ○ Calcite | ● Kieselguhr | ● Tantalum/Niobium |
| ★ Chalcedony (Gemstone) | ● Lead | ● Thorium |
| ★ Chrysoberyl (Gemstone) | ● Limestone | ● Tiger's Eye (Gemstone) |
| ★ Clay | ▲ Lithium | ▲ Tin |
| ● Cobalt | ● Malachite (Gemstone) | ● Titanium |
| ● Copper | ★ Manganese | ● Tourmaline (Gemstone) |
| ● Corundum | ● Mica | ● Tungsten |
| ◆ Diamond (Alluvial) | ● Mineral Pigment | ● Uranium |
| ● Diamond (General) | ● Molybdenum | ★ Wollastonite |
| ◆ Diamond (in Kimberlite) | ★ Nickel | ★ Zinc |
| ■ Dimension Stone | ● Nitrate | ● Zirconium |
| ● Dolomite | ● Petroleum | |

Legend

□ Northern Cape Province

Simplified Geology

- Beaufort Group
- Cape Granite Suite, etc.
- Cape Supergroup, Natal Group
- Dwyka and Ecca Groups
- Gariop Supergroup
- Kalahari Group
- Namaqua and Natal Metamorphic Provinces
- Transvaal Supergroup
- Vanrhynsdorp and Nama Groups
- Ventersdorp Supergroup
- Olifantshoek Supergroup



SCALE 1:2 500 000

Figure 11: Mineral map of the Northern Cape province

(Source: Council for Geosciences, 2022)

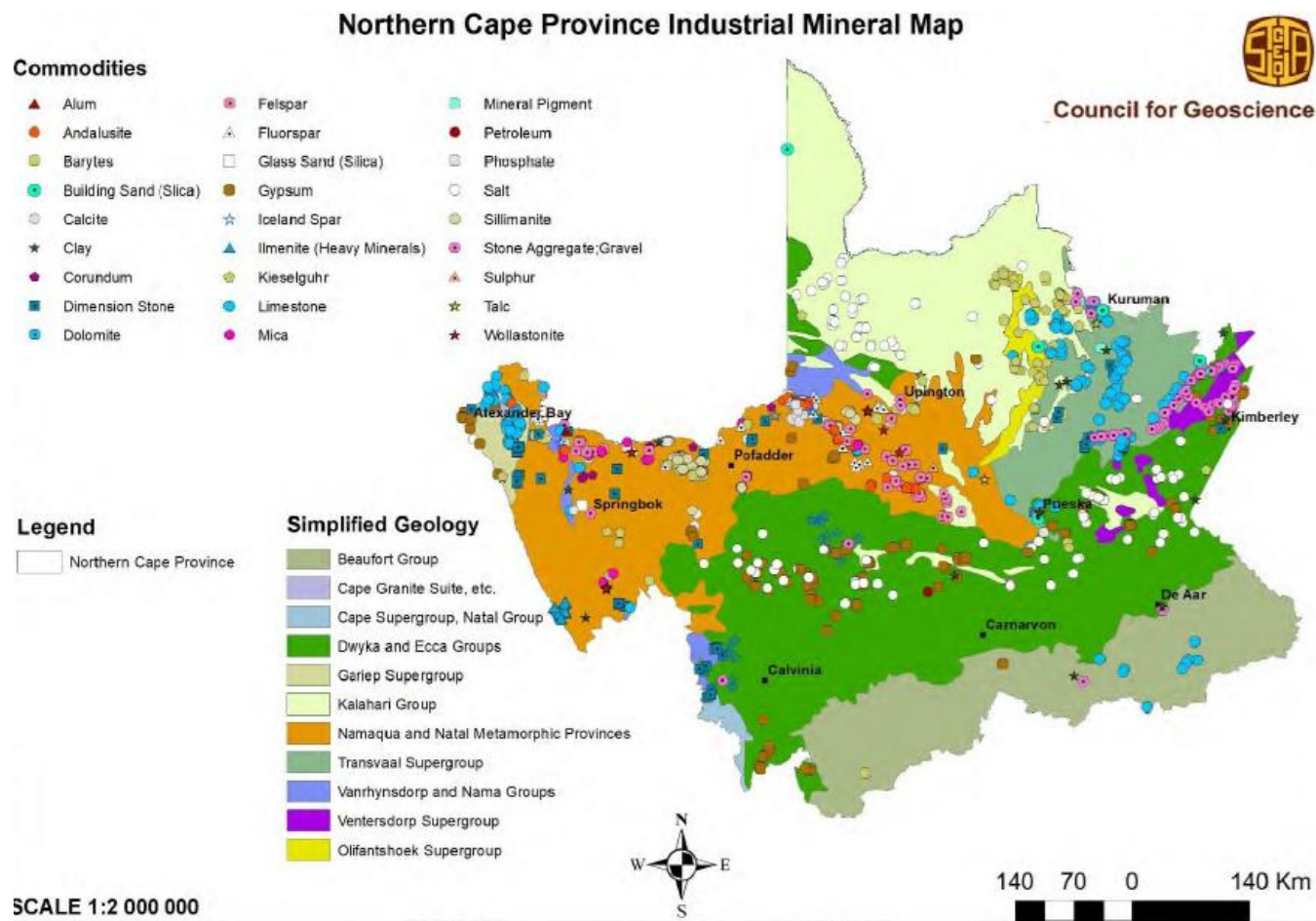


Figure 12: Industrial mineral map of the Northern Cape province

(Source: Council for Geosciences, 2022)

2.3.2. Mining operations

Large-scale mining

The exploitation of minerals in the province is done using both large-scale and small-scale mining methods. Large-scale mining is carried out using open pit and underground mining methods. There are several large-scale mining operations in the province, and these are shown in figure 13. Details on some of the operations are provided below.

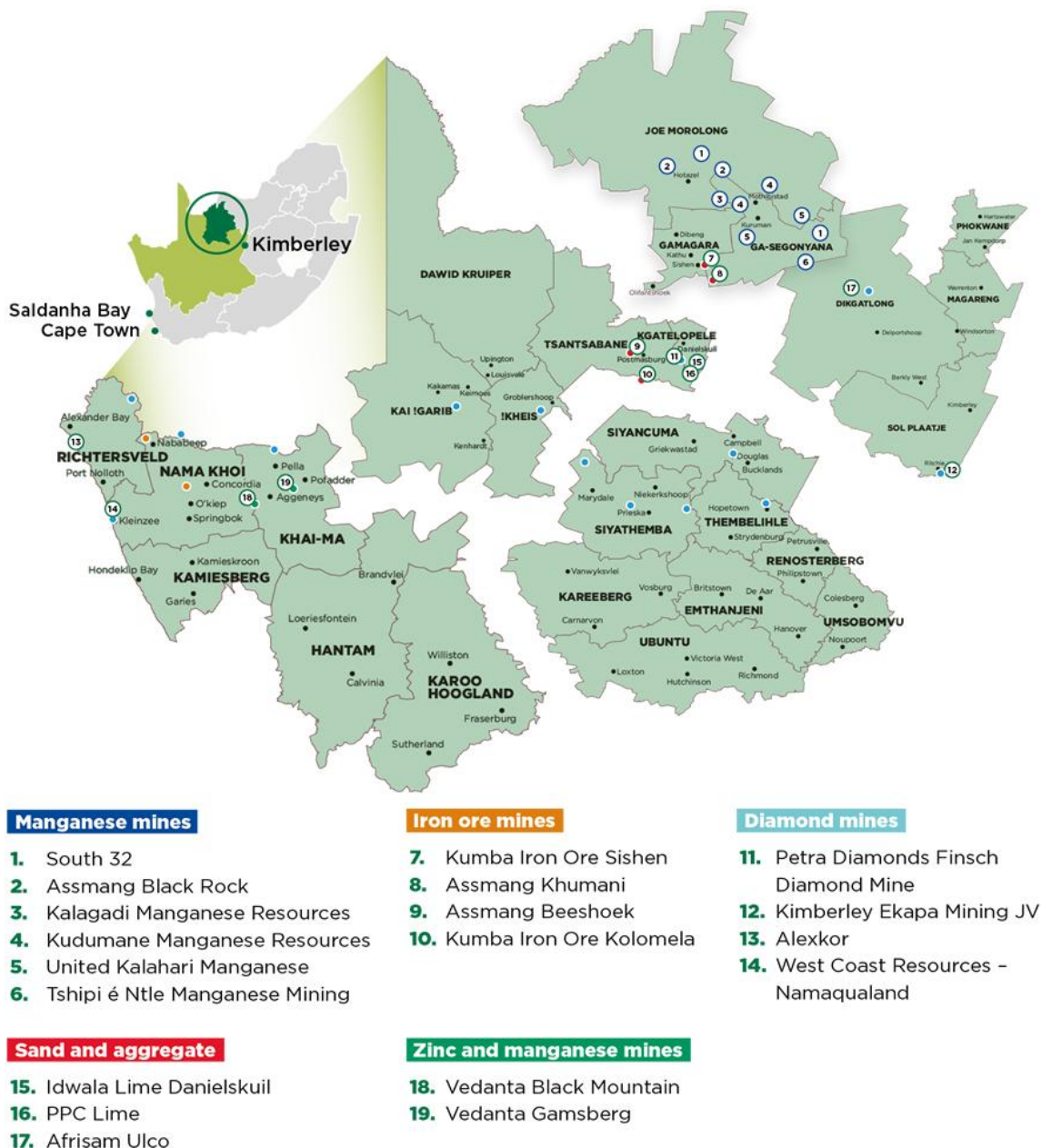


Figure 13: Mining operations in the Northern Cape province

(Source: Minerals Council South Africa, 2022)

Iron ore mines

- *Sishen mine* – It is located near the town of Kathu, it ranks among the largest open-pit mines globally, stretching approximately 14 kilometres in length. The mine holds sufficient ore reserves to support operations for an estimated 14 more years (AngloAmerican, 2025).
- *Kolomela mine* – it is situated near Postmasburg. It has been operational since 2011. It is known for producing high-grade iron ore. The mine has several open pits and has an estimated life of mine of 14 years (AngloAmerican, 2025).
- *Beeshoek mine* – it is situated near the town of Postmasburg. It operates as an open cast iron ore mine, with pit depths reaching around 140 metres. Most of the iron ore extracted at Beeshoek is supplied to the domestic market, with limited volumes exported (Minerals Council South Africa, 2022; Assmang, n.d).
- *Khumani mine* – it is Located approximately 30 kilometres south of Kathu and 65 kilometres north of Beeshoek mine. Khumani mine was initially designed for an annual output of 10 million tonnes of export-grade iron ore. Its capacity has since increased to 14 million tonnes per year. The operation involves large-scale open cast mining, with pit depths reaching 250 metres (Minerals Council South Africa, 2022; African Rainbow Minerals, 2007).
- *Sedibeng mine* – It is also located near Postmasburg. It has been operational since 2012 and produces approximately 2 million tonnes of medium-to-high grade iron ore annually. Mining is conducted through open cast methods. It is relatively smaller but an active contributor to province's iron ore production (Minerals Council South Africa, 2022; Sedibeng Iron Ore, n.d)

Manganese mines

- *Hotazel Manganese mines* – they are located in the Kalahari Basin near the town of Hotazel. There are two operations: the open-cut Mamatwan Mine and the underground Wessels Mine (Minerals Council South Africa, 2022).
- *Kalagadi manganese mine* – it is located west of Hotazel within the Kalahari Basin. The operation spans three farms and holds mining rights over an estimated 960 million tonnes of ore (Minerals Council South Africa, 2022; Kalagadi Manganese, 2019).

- *Kudumane manganese mine* – it is situated in the John Taolo Gaetsewe District Municipality. It is approximately 1 kilometre from the town of Hotazel and about 60 kilometres from Kuruman. The operation forms part of the Kalahari Manganese Field (Minerals Council South Africa, 2022; Kudumane Manganese Resources, 2025).
- Tshipi é Ntle manganese mine – it is also located on the Kalahari Manganese Field northwest of Kathu and south of Hotazel. It is an open cast mine with an integrated processing plant (Minerals Council South Africa, 2022; Tshipi é Ntle Manganese Mining, n.d).

Diamond mines

- *Finsch mine* – this is one of South Africa’s largest diamond operations, located near Lime Acres, about 160 km northwest of Kimberley. It is an underground diamond mine contributing significantly to employment and GDP of the ZF Mgcawu district (Petra Diamonds, 2025).
- *Lower Orange River Diamonds operations* – These are alluvial diamond operations located on the banks of the Orange River. These operations include eight mining and exploration areas are Baken, Bloeddrift, Nxodap Jakkalsberg, Suidhek, Reuning, AACE, and Swartpoort. In total, these deposits extend for 109 km along the southern bank of the Orange River (Lower Orange River Diamonds, 2025).

Zinc mines

- *Black Mountain mine* – the operation is an important part of South Africa’s base metal mining industry, located near Aggeneys in the Namakwa district. It comprises of two operations - Swartberg and Deeps underground operations. These produce zinc, copper and lead. Gamsberg mine which is one of the largest open-pit zinc mine, also forms part of the Black Mountain Mine (Vedanta, 2021).

Small scale mining

The Northern Cape province has a long history of artisanal and small-scale mining (ASM) activities which can be traced back to the discoveries of copper in Namaqualand in the 1830s and diamonds in Kimberley in 1860s. Artisanal and small-scale mining (ASM) continues to take place across the Northern Cape Province, both through legal and informal operations. Key minerals extracted by artisanal and small-scale miners include diamonds in the Kimberley

area, tiger's eye in Prieska, Niekerkshoop, and Griekwastad, as well as various semi-precious stones found throughout the province (Ledwaba, 2014). These include minerals such as amethyst, jasper, agate, and garnet, and these are mined from surface deposits through shallow excavations in geologically favourable zones.

As the case across the country, illegal mining is a concern in the province. However, there have been notable efforts to formalise ASM activities in the province. In 2018, the diamond miners in Kimberley were granted mining permits, marking a significant step toward the regulation of the sector. This was attained through stakeholder collaboration that included several stakeholders including Ekapa Mining, artisanal miners, DMRE, provincial government, and Sol Plaatje Local Municipality (Department of Mineral Resources and Energy, 2018).

Further ASM support has been anticipated with the publication of the Artisanal and Small-Scale Mining Policy in 2022, which aims to establish a formalised, sustainable ASM industry in South Africa (Department of Mineral Resources and Energy, 2022). With its implementation, more structured interventions are expected, including improved access to permits, institutional support, training, and financial assistance, all aimed at reducing illegal mining and promoting responsible, community-based mineral development.

2.3.3. Contribution of mining in the province

Figure 14 shows the contribution of the different provinces to total mining employment. Of the 480, 427 people by the mining sector, the largest share is constituted by the North West (i.e., 27.7%). This translates to 133,186 jobs. It is followed by Mpumalanga accounting for 24.6% of the total employment (i.e., this is 119,103 jobs). The Northern Cape's share of employment was 9.3% with 44,443 people working the MMS.

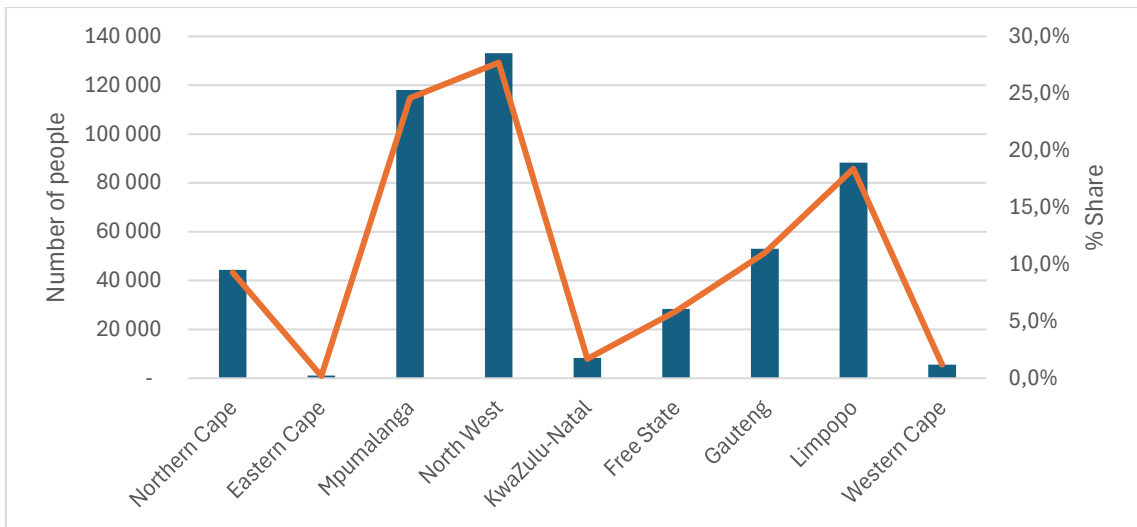


Figure 14: Provincial contribution to total mining employment

(Source: Department of Mineral Resources and Energy, 2023)

Figure 15 illustrates the distribution of mineral sales by province, highlighting each province's contribution to the total mineral sales revenue generated by the country. Mpumalanga leads with the highest share, accounting for 28.2% of total mineral sales revenue. It is followed by the North West Province, which contributes 21.9%, and the Northern Cape, which ranks third with 19.7% of the national total mineral sales revenue. This translates to approximately R150 billion in mineral sales.

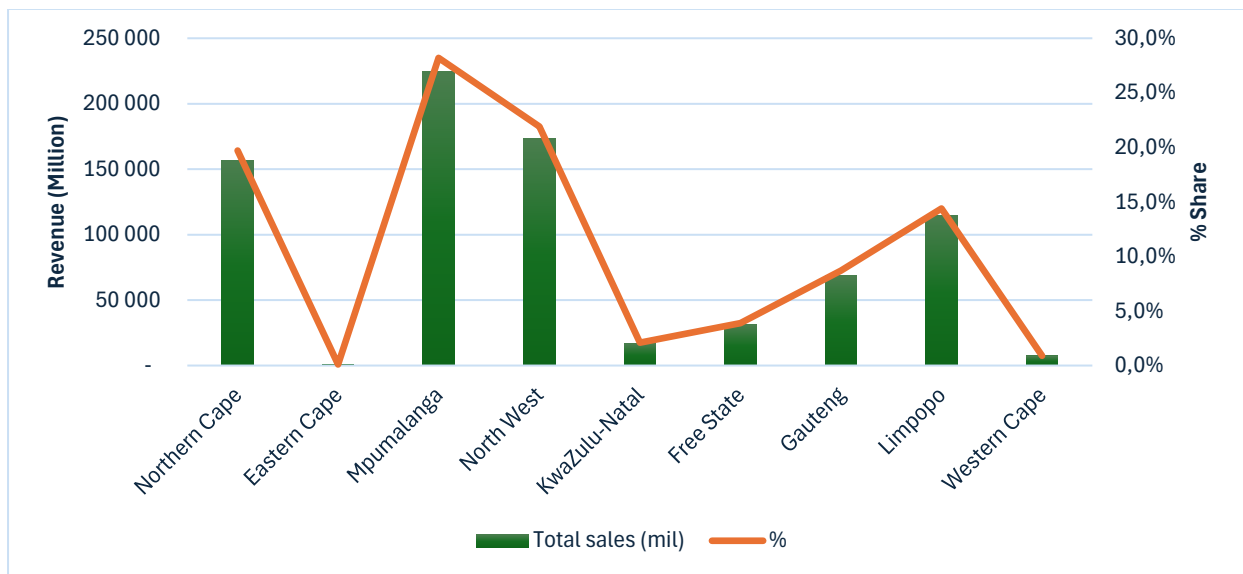


Figure 15: Mineral sales revenue generated by provinces

(Source: Department of Mineral Resources and Energy, 2023)

Figures 16, 17, and 18 present data on production and employment for three key commodities that are major contributors to the mining sector in the Northern Cape Province. These commodities are iron ore, manganese, and diamonds. As shown in Figure 16, iron ore production has experienced fluctuations over the years but has consistently remained above 50 million tonnes annually. Notably, employment in the iron ore sector has increased steadily since 2016, rising from 16,651 jobs in 2016 to 23,762 in 2023.

From figure 17, an upward trend in manganese production is seen, with production output increasing from 11 million tonnes in 2016 to 19 million tonnes in 2023—representing a 72.7% increase over the period. Total employment has also increased from 7,242 in 2016 to 11,503 in 2023. The highest level of employment was recorded in 2021, reaching 13,340 jobs, before declining slightly to the 2023 figure.

Figure 18 illustrates trends in diamond production and employment between 2013 and 2023. Overall, diamond production declined from 8 million carats in 2013 to 6 million carats in 2023. As seen on the figure, production peaked in 2022 at 10 million carats—the highest level recorded during the period—before declining again. Employment in the diamond sub-sector decreased between 2016 and 2021 but rebounded in 2022, reaching 14,856 jobs in 2023. This represents an increase compared to the 13,579 jobs recorded in 2013, indicating a net gain of 1,277 jobs in employment over the decade.

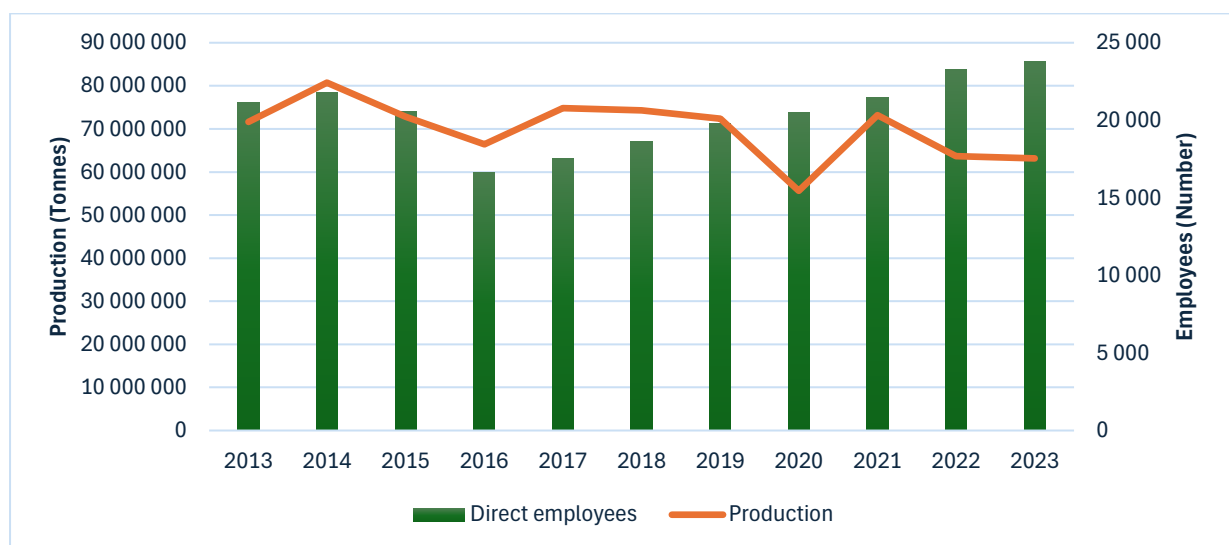


Figure 16: Total production and employment for iron ore

(Source: Minerals Council South Africa, 2023)



Figure 17: Total production and employment for manganese

(Source: Minerals Council South Africa, 2023)

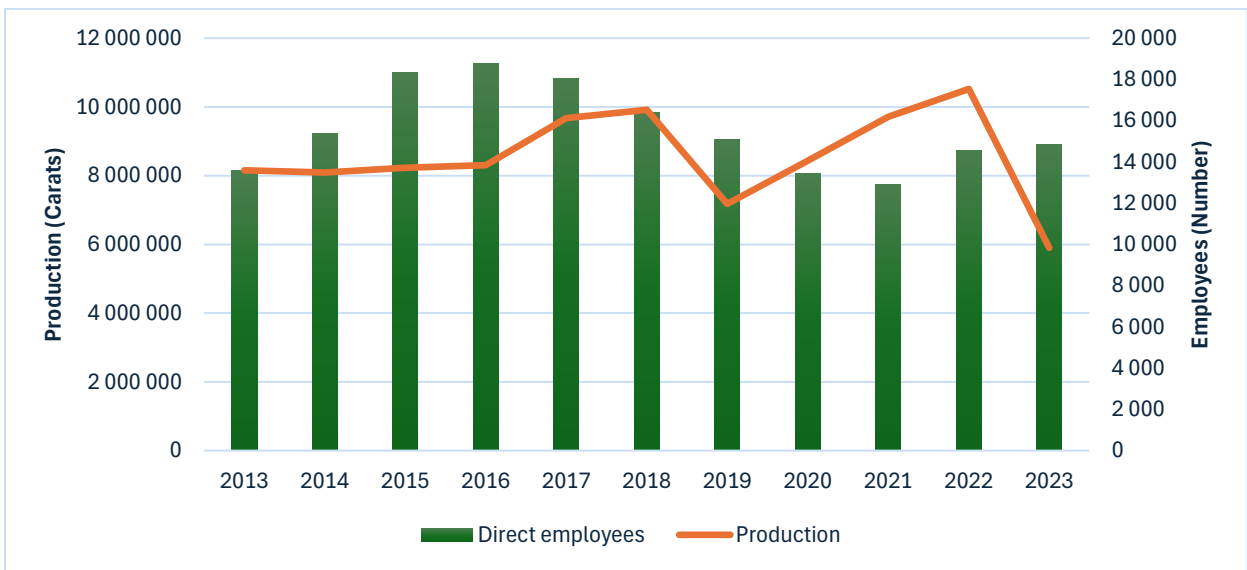


Figure 18: Total production and employment for diamonds

(Source: Minerals Council South Africa, 2023)

2.4. Skills analysis in the province

The skills profile of the working-age population in the Northern Cape, like other provinces in South Africa, is characterized by a mix of skills levels. The province’s workforce is composed of skilled, semi-skilled, and unskilled labour, each playing a distinct role in the economy.

Skilled labour refers to individuals who possess specialized knowledge, formal education, vocational training, and extensive on-the-job experience. These workers are typically qualified professionals or technicians capable of performing complex tasks (Trade and Industrial Policy Strategies, 2008).

Semi-skilled labour includes workers who may have completed vocational training or apprenticeships, or who have acquired practical skills through substantial work experience. They often perform tasks that require some technical ability but not the full expertise of skilled professionals. Unskilled labour comprises individuals with limited formal education or training. Their work is generally manual, repetitive, and can be learned relatively quickly. Despite the lack of formal qualifications, this group plays a vital role in supporting various sectors of the economy (Trade and Industrial Policy Strategies, 2008).

Table 7 presents a comparative overview of the skills profile of the province's workforce between 2017 and 2022. The data reveals a significant shift in the composition of labour over the five-year period. In 2022, most of the workforce was classified as semi-skilled, accounting for 46.3% of the total workforce—an increase from 16.7% in 2017. This category includes clerical staff, sales and service workers, skilled agricultural workers, craft and related trades, as well as plant and machine operators. The second largest group comprised low-skilled workers, who typically perform elementary tasks. Their share declined from 38.6% in 2017 to 35.6% in 2022, indicating a modest reduction in reliance on unskilled labour.

Meanwhile, the skilled workforce—those with specialized training and qualifications—grew from 16.7% in 2017 to 18.1% in 2022, reflecting a gradual improvement in the province's human capital base. Overall, the data suggests a positive trend towards a more skilled and semi-skilled workforce, which may enhance productivity and support economic diversification in the province.

Table 7: Skills levels of workforce in Northern Cape

Skills level	2017	2022
Skilled	16.7%	18.1%
Semi-skilled	44.6%	46.3%
Low skilled	38.6%	35.6%

(Source: Statistics South Africa, 2022)

While the proportion of skilled workers in the province has shown improvement, only 7% of individuals aged 20 years and older have attained post-school education. This highlights a critical gap in higher-level qualifications and underscores the need to expand access to tertiary and vocational training. Increasing post-school qualifications, particularly in high-demand fields such as computer science, software engineering, and data science, remains a strategic priority for the province.

Several skills gaps and occupational shortages have been identified within the province's labour market, as outlined in tables 8. These insights are drawn from the 2020 report by the Local Government Sector Education and Training Authority (LGSETA). Notably, several of the top occupations in demand fall within the engineering field, which is also recognised as a critical skills area in the mining sector—a key driver of the provincial economy. The skills gaps identified by LGSETA include financial auditing skills, management skills, occupational health and safety, governance and ethics, personal development, IT skills, leadership and management, legal skills, planning and writing skills. The latter encompasses technical report writing, editing skills, business writing skills, as well as intermediate and advanced report writing.

Table 8: Occupational shortages in the Northern Cape province

OFO Code	Occupation
2017-215101	Electrical Engineer
2017-121101	Chief Financial Officer
2017-121301	Planning and Development Manager
2017-216401	Town Planner
2017-214201	Civil Engineer
2017-132104	Engineering Manager
2017-311301	Electrical Engineering Technician
2017-311501	Mechanical Engineering Technician
2017-831313	Water Process Worker
2017-133101	ICT/IT Manager

(Source: LGSETA, 2020)

2.5. Education and training landscape

The Northern Cape’s education and training landscape is supported by a network of schools, technical and vocational education and training (TVET) colleges, Community and Education and Training (CET) college, universities, and training providers. These institutions offer a broad spectrum of programmes that cater to the diverse educational and developmental needs of the province’s population, from foundational schooling to specialised vocational and academic qualifications. As reported by the Northern Cape Department of Education (2024), the province has 554 schools and these include primary schools (i.e., 313), secondary schools (i.e., 123) as well as combined, intermediate and special schools (i.e., 118).

Post-school education is delivered through several institutions such as the Sol Plaatje University, University of South Africa (UNISA), Northern Cape Urban TVET College, Northern Cape Rural TVET College, Northern Cape CET College, Northern Cape CET college among others. Sol Plaatje University (SPU) is the only university located in Kimberley in the province. It offers undergraduate and postgraduate programmes across four faculties: Economic and Management Sciences, Education, Humanities, and Natural and Applied Sciences.

Sol Plaatje University, located in Kimberley, is the province's only resident university. It offers both undergraduate and postgraduate programmes across four faculties: Economic and Management Sciences, Education, Humanities, and Natural and Applied Sciences (Sol Plaatje University, 2025).

Complementing SPU is UNISA, which operates a regional centre in Kimberley. UNISA provides access to higher education, particularly for working adults and remote learners, offering qualifications in several fields including Accounting Sciences, Agriculture and Environmental Sciences, Economic and Management Sciences, Education, Human Sciences, Law as well as Science, Engineering and Technology (UNISA, 2025).

The Northern Cape Urban TVET College has three campuses in Kimberley: Moremogolo, Phatsimang, and City campus. The college offers National Certificate programmes in finance, economics and accounting, information technology, tourism, safety in society, transport and logistics, and computer science. It also offers National Diplomas and Occupational programmes in brick laying, hair dressing, carpentry and joinery and plumbing (Northern Cape Urban TVET College, n.d).

The Northern Cape Rural TVET College operates across five campuses located in Kathu, Upington, De Aar, Kuruman, and Namaqualand. These campuses offer pre and post matric programmes in engineering and business studies. The admission requirement for pre-matric programmes is grade 9 and equivalent level of study. Programmes offered under business studies include hospitality, office administration, transport and logistics, human resources, financial management, tourism and others. In engineering, the college offers electrical infrastructure construction, fitting and turning, fabrication, automation and others (Northern Cape Rural TVET College, n.d).

The Northern Cape CET college offers Senior Certificate and the General Education and Training Certificate. In addition, there are private institutions such as Boston City Campus and Qualitas Career Academy that supports education and training in the province. Table 9 lists some of the institutions and highlight programme offerings that are related to mining. These programmes equip students with practical, industry-relevant competencies that are needed in the MMS.

Table 9: Post-school education and training institutions and mining related programmes

Academic Institutions	Names	Programme offered (i.e., related to mining)
University	Sol Plaatje University	Bachelor of Science in Chemistry
		Bachelor of Science in Geography
		Bachelor of Environmental Science
Technical and Vocational Colleges	Northern Cape Rural TVET College	Electrical Infrastructure Construction
		Electrical
		Mechanic
		Fitting and Turning
		Boilermaker
		Auto Electrical
		Welding
		Millwright

Skills development in the province is also supported by Sector Education and Training Authorities (SETAs). The MQA has established partnerships with the Northern Cape Urban and Rural TVET colleges as well as the Northern Cape CET college. These colleges also work together with several other SETAs including Manufacturing, Engineering and Related Services Sector Education and Training Authority (MerSETA), Education and Training Authority (ETDP) SETA, Bank SETA, Media, Information and Communication Technologies (MICT) SETA, and others.

2.6. Skills development policies and initiatives

This section discusses policies, laws and strategies that support skills development and training. These are presented at three levels considering national frameworks, sectoral legislation and strategies and provincial development strategies.

2.6.1. National policy and strategy frameworks

Constitution of the Republic of South Africa

The Constitution of the Republic of South Africa sets out the foundation for the country's socioeconomic development by placing its citizens at the centre. The Constitution aims to address the past injustices and in doing so, support the country in building a society that is based on democratic values, social justice, and fundamental human. Specifically, the Bill of Rights enshrines fundamental rights and freedoms for all citizens and ensure that they are enjoyed by various groups within the country.

The Bill of Rights promotes equality, human dignity, life, freedom and security, privacy, freedom of expression and others. Section 29 of the Constitution highlights the everyone's right "(a) to a basic education including basic education, and (b) to further education, which the state, through reasonable measures, must make progressively available and accessible" (South African government, 1996:12). This fundamental right has been realised through various legislative frameworks, one of which is the Skills Development Act (No. 97 of 1998).

Skills Development Act

The overarching goal of the Skills Development Act is to "provide an institutional framework to devise and implement national, sector and workplace strategies to develop and improve the skills of the South African work force" (South African government, 1998). The Act was enacted to address the skills gaps and enhance the overall skill level of the country's workforce closing the gap between skills supply and demand. Through the Skills Development Act, the National Skills Authority and National Skills Fund were established. More so, sector education and training authorities (SETAs) were formed.

There are twenty-one (21) SETAs in the country, and they are mandated to drive skills development in the different economic sectors. The Mining Qualification Authority (MQA) supports skills development in the mining and mineral sector, and its mission is to "ensure that the mining and minerals sector has sufficient competent people who will improve health and safety, employment equity and increase productivity standards" (Mining Qualifications Authority, 2023). Skills development in the country is also embedded in the country's socioeconomic development frameworks. This is because of the direct

relationship between skills development and training and the triple challenges affecting the country (i.e., poverty, inequality and unemployment).

National Development Plan

The National Development Plan (NDP) aims to eradicate poverty and inequality by 2030. Specifically, the NDP is striving to reduce the percentage of households with income below R419 per person from 39% to zero in 2030. The NDP further aims to reduce the Gini Coefficient from 0.69 (i.e., in 2009) to 0.60 (i.e., in 2030) (National Planning Commission, 2012). The attainment of the NDP's targets has been linked to several priority areas and these include the need to: increase economic performance and employment, develop economic infrastructure, build an integrated and inclusive rural economy, improve education, training and innovation, and support the transformation of the country's society.

These country's imperatives are to be achieved through several strategies. At the centre of these is the need to facilitate skills development in the country. In particular, the NDP has highlighted the need to provide access to young and unskilled workers into the labour market (National Planning Commission, 2012).

National Skills Development Strategy (NSDS) III

The implementation of the NDP is supported by several strategies including the National Skills Development Strategy (NSDS) III whose aim is to support the realisation of The National Skills Development Strategy III aims to address skills gaps and shortages and promote skills development in the workforce. It also aims to improve the efficiency and effectiveness of the skills development system (Department of Higher Education and Training, 2019). The NSDS III is tied to transformational imperatives in the country considering disparities that are seen across race, class, gender, location, age and HIV/AIDS status. In this regard, the NSDS III promotes prioritisation of Blacks South Africans, women, youth, rural areas over urban areas, and people living with disabilities.

2.6.2. Sector policies and strategies

Mineral and Petroleum Resource Development Act (No. 28 of 2002)

The Mineral and Petroleum Resource Development Act (No. 28 of 2002) is the primary legislation governing the mining and minerals sector in the country. Its overarching goal is to ensure equitable access and sustainable development of the country's mineral and petroleum resources (Government gazette, 2002). This is in recognition of the history of mining in the country that is characterised by discriminatory practices and the exploitation of mineral resources without consideration of social and environmental objectives that are key to the country's development agenda.

To this end, the MPRDA has been instrumental in ensuring that South Africa's mining sector benefits all its citizens, particularly historically disadvantaged communities. Sector 100 of the Act called government to develop a broad-based socioeconomic empowerment charter (i.e., mining charter) that will facilitate the transformation of the mining sector.

Mine Health and Safety Act (No. 29 of 1996)

The holders of mining licences are obligated to comply with the Mine Health and Safety Act (MHSA), which serves as the cornerstone of occupational health and safety regulation within the mining sector. The primary aim of the MHSA is to safeguard the health and safety of employees and other individuals present at mining operations. This overarching goal is supported by several objectives including promoting the culture of health and safety, providing appropriate systems for employee, employer and the state ensuring participation in health and safety, promoting training and human resources development, among others (Republic of South Africa, 1996).

Mining licence holders are responsible for ensuring that employees are adequately trained to identify, manage, and respond to the risks inherent in the mining environment. To this end, skills development is a critical pillar to achieving zero harm in the MMS.

Mining Charter

The Mining Charter III aims to facilitate sustainable transformation, growth and development of the mining sector (Government gazette, 2018). This objective is supported by several areas of intervention covering ownership, procurement, supplier and enterprise development, human resource development (HRD), employment equity (EE), mine

community development, and housing and living conditions. Within human resource development, the charter talks to the need to (1) produce skilled, trained and diverse workforce to meet the needs of the mining sector, (2) develop skills that enhance productivity of workforce increasing the employability of disadvantaged South Africans, and (3) develop entrepreneurial skills to improve livelihood and create opportunities outside of mining (Government gazette, 2018).

To support these, mining companies are required to invest a minimum 5% of leviable amount (excluding the statutory skills development levy) on essential skills development activities such as development of science, technology, engineering and mathematics (STEM) skills, adult basic education and training, artisan training, learnerships, bursaries and other skills training initiatives for people in the community which include portable skills training (Centre for Applied Legal Studies, 2017).

Social and Labour Plan

The Mining Charter is implemented through Social and Labour Plans which SLPs outline the strategies that mining companies intend to use for community development, including their approaches to skills training. This framework aims to extend socio-economic benefits not only to workers but also to the host communities and labour sending areas (Benya, 2017). According to Centre for Applied Legal Studies (CALs) (2017), the rationale behind SLPs is to ensure that mining companies offer opportunities for workers and communities to benefit from local mineral resources. The implementation period of projects contained in SLPs is five years and mining companies are required to submit annual reports to the Department of Mineral Resources.

The SLP projects needs to contribute towards mine community development, human resource development (HRD), employment equity, housing and living conditions, and address the impacts of downscaling and retrenchments (Department of Mineral Resources, 2010). The HRD programmes, specifically, need to accommodate both employees and communities equipping them with the skills that are relevant to mining as well as skills that can be used in other sectors of the economy (Centre for Applied Legal Studies, 2017).

Artisanal and Small-Scale Mining Policy

South Africa has seen a proliferation of artisanal and small-scale mining activities. These activities have been mostly driven by socioeconomic landscape in the country characterised by high unemployment and poverty rates. Most of these activities take place outside the requirements of the MPRDA, without appropriate mining licences. This has had negative consequences in the country negatively affecting several stakeholders including communities, government, mining companies and those who are working in ASM sites. In an effort to formalise the ASM, government released the ASM Policy in 2022 (Department of Minerals and Energy, 2022).

The primary objective of the policy is to formalise the ASM sector ensuring that they operate optimally and in a sustainable manner while contributing to the country's economy through taxes and job creation. The policy recognises that the ASM sector is beset with challenges and hence makes recommendations towards addressing these. The lack of skills and training within the sector is amongst the challenges and hence the policy highlights the importance of training, skills development and innovation. In particular, the policy alludes to the need for collaboration with institutions such as MQA to cater for skills needs of the sector (Department of Minerals and Energy, 2022).

Beneficiation Strategy

Mineral beneficiation is defined as the “transformation of a mineral (or a combination of minerals) to a higher value product, which can either be consumed locally or exported” (Department of Mineral Resources, 2011: ii). It is a critical component of the mining value chain as it offers increased benefits in revenue generation and job creation. South Africa’s beneficiation strategy was published in 2011 with the aim of “advance development through the optimisation of linkages in the mineral value chain, facilitation of economic diversification, job creation and industrialisation” (Department of Mineral Resources, 2011: v).

This is underscored by the concern that the level of beneficiation in the country remains relatively low. A substantial proportion of mineral products continue to be exported in raw or semi-processed form, limiting the country’s ability to fully capture the economic and developmental benefits of its mineral wealth. Several factors have been linked to the low levels of beneficiation, with skills shortages identified as a critical barrier. The strategy has

highlighted the need to “align the beneficiation skills pipeline to the National Skills Development Strategy and the Sector Skills Plans and promote skills development and partner with the relevant SETA’s and institutions of higher learning for training and labour development” (Department of Mineral Resources, 2011:7).

Critical Minerals and Metals Strategy

In recent years, there has been a surge in global attention on critical minerals, driven by their strategic importance in enabling clean energy transitions, and technological innovation. Recognising its strategic position in the global mineral market, South Africa released its Critical Minerals and Metals Strategy in 2025. The strategy outlines a coordinated national roadmap to leverage the country’s rich mineral endowment in a way that promotes inclusive growth, industrial development, and job creation (Department of Minerals and Petroleum Resources, 2025). As a leading global producer of several critical minerals including manganese, platinum group metals, vanadium, and rare earth elements South Africa is well-positioned to become a key player in the global value chains of emerging technologies such as electric vehicles, battery storage, renewable energy systems, green hydrogen, among others.

While this is the case, the strategy recognises the bottlenecks in South Africa’s MMS. To address this, the strategy is built on nine core pillars including skills development. Amongst the key areas of intervention is need to “prioritise skills development and training in high demand skills across the mineral value chain from exploration and mining to advanced processing, manufacturing, and even research” (Department of Minerals and Petroleum Resources, 2025: 30). This encompasses aligning occupational demand with education supply with higher learning institutions and developing accredited training programmes.

2.6.3. Provincial strategies

The alignment between national and provincial development strategies is important to ensure policy coherence and to optimise implementation of development programmes. It is also important in terms of facilitating stakeholder coordination and support. While this link is important, provincial and local strategies needs to be tailored to suit the provincial context considering the socio-economic landscapes and factor endowments that are often unique to

localities. Factor endowments are resources that regions can use to support economic activity, such as land, minerals, capital, and labour (Ancheta et al, 2023).

Provincial Growth and Development Plan (PGDP) Vision 2040

The Northern Cape's Provincial Growth and Development Plan (PGDP) Vision 2040 is grounded within the country's NDP. Its vision is to forge a "modern, growing and successful province. The PGDP has identified four key drivers that are critical to the vision, and these are economic transformation, growth and development, social equity and human welfare, environmental sustainability and resilience, as well as effective and efficient governance

The areas of intervention linked to economic transformation, growth and development include agriculture and agro-processing, mining and mineral beneficiation, rural development and land reform, development of the energy sector, employment and skills development, innovation and knowledge economy, among others. Skills development is recognised as a cross-cutting priority that is central to the attainment of the PGDP's vision. The plan highlights the importance of skills development in diversifying the province's economy (Office of the Premier, 2023).

Integrated Development Plans

The Integrated Development Plans (IDPs) are a key component of South Africa's strategy for promoting economic growth, job creation, and sustainable development (de Wet et al., 2020). They integrate economic, social, environmental, and fiscal strategies to allocate resources efficiently, ensuring alignment with community and stakeholder needs over a five-year period, with annual reviews for adaptation. The main objectives of IDPs include fostering economic growth, improving quality of life, promoting environmental sustainability, and managing fiscal resources effectively. In the Northern Cape province, all district municipalities have developed their respective IDPs, which serve as strategic frameworks for guiding development priorities, coordinating service delivery, and aligning local initiatives with provincial and national goals.

District Development Model

The District Development Model (DDM) is a national initiative introduced by the government in 2019. It was developed at the back of this concern: *“Lack of coordination between national and provincial governments, between departments and particularly at local government level, has not served the country. The pattern of operating in silos has led to lack of coherence in planning and implementation and has made monitoring and oversight of government’s programme difficult”* (Department of Cooperative Governance, n.d). To this end, the DDM was developed to address challenges in governance, planning, and implementation by fostering integrated development at the district level. The DDM is situated within the principle of *“One District, One Plan”*.

According to the South African Local Government Association (SALGA) (2021), the DDM is designed to foster synergy between national, provincial, and local priorities, while enabling the implementation of immediate priority projects. The model introduces a collaborative planning process undertaken at local, district, and metropolitan levels by all three spheres of government. This process culminates in the development of a single, strategically focused "One Plan" for each of the 44 districts and 8 metropolitan municipalities across South Africa. THE DDM approach is critical to skills development as it promotes integrated planning and coordination involving multiple stakeholders at different levels. By aligning local economic development initiatives with national skills strategies, the model helps ensure that training and capacity-building efforts are responsive to the specific needs of each district.

2.6.4. Skills development initiatives in the province

Several skills development initiatives have been implemented in the Northern Cape province to equip individuals with the knowledge and expertise needed to participate in the province’s economic development. Some of the initiatives are highlighted below.

DLO Skills initiatives (Solar Panel Cleaning and Maintenance)

The DLO Skills Initiative, based in De Aar within the Emthanjeni Local Municipality, is a collaborative effort between DLO Energy Resource Group and Longyuan Power Group, China’s largest wind power operator. This partnership aims to align skills development with South Africa’s renewable energy transition, ensuring that local communities benefit from

emerging opportunities in the green economy (Burger, 2025). As part of the initiative, 100 unemployed youth were trained over a three-month period, focusing on solar panel cleaning and maintenance. The programme integrated theoretical instruction, hands-on technical training, workplace exposure, and post-programme career support, equipping participants with practical skills and pathways to employment (Burger, 2025).

In addition to technical training, DLO Energy Resource Group committed approximately R15 million in scholarships for 390 university students and providing healthcare services through a mobile clinic, further demonstrating its commitment to inclusive and sustainable development.

Labour Activation Programmes (LAP)

The Labour Activation Programme (LAP) is an initiative led by the Department of Employment and Labour, aimed at addressing unemployment through targeted skills development and job creation. Officially launched in May 2024 in Kimberley, the programme is funded by the Unemployment Insurance Fund (UIF) and focuses on equipping unemployed youth with vocational skills in high-demand sectors such as agriculture, construction, energy, ICT, and business process outsourcing. As part of its commitment, the department signed a pledge to train 23,000 young people across various provinces, supported by a budget allocation of R725 million. To date, approximately 11,000 participants have already been enrolled in sector-specific training programmes, including construction, agriculture, mining, ICT, security, and hospitality. These programmes are structured over a three-year period, combining practical training with career development support to enhance employability and long-term economic inclusion (Republic of South Africa, 2024).

Talent Pipeline Programme (TPP)

Sol Plaatje University provides a pre-university initiative designed to bridge the educational gap for high-achieving learners from under-resourced and rural schools in the province. The programme targets grade 10 to 12 students and offers teaching that covers ten subjects including Mathematics, Computer Science, Economics, Scientific Thinking together with personal development, sport and music. This programme is supported by the Northern Cape provincial government and De Beers (Hoo, 2022).

Bereka Moshu programme

Bereka Moshu is a youth development initiative launched by the Northern Cape Provincial Government to address the issue of youth unemployment across the province. The programme is designed to equip young people with practical skills and work experience through structured internships and placements within various government departments and public institutions. The initiative aims to train 150 youth participants, offering them hands-on exposure in roles that contribute to public service delivery. Among the key components of the programme are the placement of library assistants and sport coordinators in public libraries and community centres, facilitated by the Department of Sports, Arts and Culture.

The programme has been established with FASSET (Finance and Accounting Services Sector Education and Training Authority), which supports the placement of 50 graduates in internship positions within the Northern Cape Provincial Treasury. This collaboration ensures that participants gain relevant experience in financial management, accounting, and public sector administration. The Bereka Moshu is coordinated by the Office of the Premier and supported by multiple stakeholders (Northern Cape Provincial Government, n.d).

Centre for Entrepreneurship Development and Research (CEDAR)

The Centre for Entrepreneurship and Research (CEDAR) at Sol Plaatje University and the Centre for Entrepreneurship and Rapid Incubator (CfERI) are hubs committed to creating entrepreneurial growth in the Northern Cape. They integrate academic programmes with hands-on business development, making it a valuable resource for both aspiring and current entrepreneurs. CEDAR offers formal education in entrepreneurship. CEDAR empowers communities with outreach and mentorship efforts in areas such as Port Nolloth and Hondeklip Bay (Sol Plaatje University, 2025). Through the Centre for Entrepreneurship and Rapid Incubator (CfERI), entrepreneurs receive coaching, legal and financial guidance and opportunities for seed funding. CEDAR works in partnership with key institutions including the Northern Cape Chamber of Commerce and Industry (NOCCI), Department of Small Business Development (DSBD), and the Small Enterprise Development Agency (SEDA).

Construction Road Maintenance Short Skills Programme

The Construction Road Maintenance Short Skills Programme in the province aims to address youth unemployment by equipping young people with road construction and maintenance skills. The programme was launched in Keimos and aims to train 1,000 unemployed youth across various districts. The initial intake involved 98 learners from the Pixley Ka Seme District. The programme is supported by the Construction Education and Training Authority (CETA). Training will be delivered over a three-month period, after which the trainees will progress into a structured 12-month learnership and a 36-month apprenticeship. The programme specifically targets unemployed youth between ages 18 and 35 years, with priority given to women, persons with disabilities and individuals from disadvantaged communities (Northern Cape Provincial Government, n.d).

Several development projects have been implemented in the Northern Cape Province by a range of stakeholders, including mining companies. One notable example is Anglo American Zimele, an enterprise development programme aimed at empowering individuals, communities, and local small businesses. Established in 1989, Zimele supports emerging entrepreneurs through access to funding, business training, mentorship, and market linkages, with the goal of fostering sustainable livelihoods and promoting self-sufficiency beyond the mine (AngloAmerican, 2024). Additional education and training programmes implemented by other mining companies in collaboration with government, SETAs and other stakeholders.

2.7. Conclusion

This chapter provided an overview of the socioeconomic landscape of the Northern Cape province and discussed the state of the MMS in the province. The chapter also presented an analysis of the skills in the province including the education and training landscape and reviewed the skills development policies and initiatives that have been implemented to support skills development in the province.

The socioeconomic landscape of the Northern Cape is characterised by low population density and high unemployment rate. Despite the challenges of unemployment, the province holds substantial mineral wealth, including deposits of critical minerals, positioning it as a strategic asset in South Africa's resource economy and global supply chains. Considering this potential,

skills development is both a strategic imperative and a recognised priority in provincial planning. It is therefore important to understand the skills development needs of the province to ensure alignment between workforce capabilities and the evolving demands of the province's economic sectors.

3. APPROACH TO THE STUDY

3.1. Introduction

This chapter outlines the methodology employed in the study, detailing the research design, data collection and analysis methods, research reliability and validity, ethical considerations, and study limitations. The methodology is underpinned by a conceptual framework which guided the selection of methods, shaped the interpretation of findings. This was important in ensuring alignment between the research objectives and the overall analytical approach.

3.2. Conceptual framework underpinning the study

Figure 19 illustrates the conceptual framework that guided this study in both in terms of data collection and interpretation of the results. The framework was adapted from the Skills Supply and Demand Analysis Framework developed by the Department of Higher Education and Training (DHET) to inform skills policy and planning responses. Within this framework, skills development needs are understood as a factor of skills supply and skills demand. The Department of Higher Education and Training (2022:16) defines skills supply as *“skills possessed by individuals who are either working (the employed) or willing, able and available to work (the unemployed)”*. It speaks to the *“what is there”* – both in terms of the availability and quality of the skills. As depicted on the framework, this is established through educational levels, demographics, occupational skills, training programmes and labour market participation.

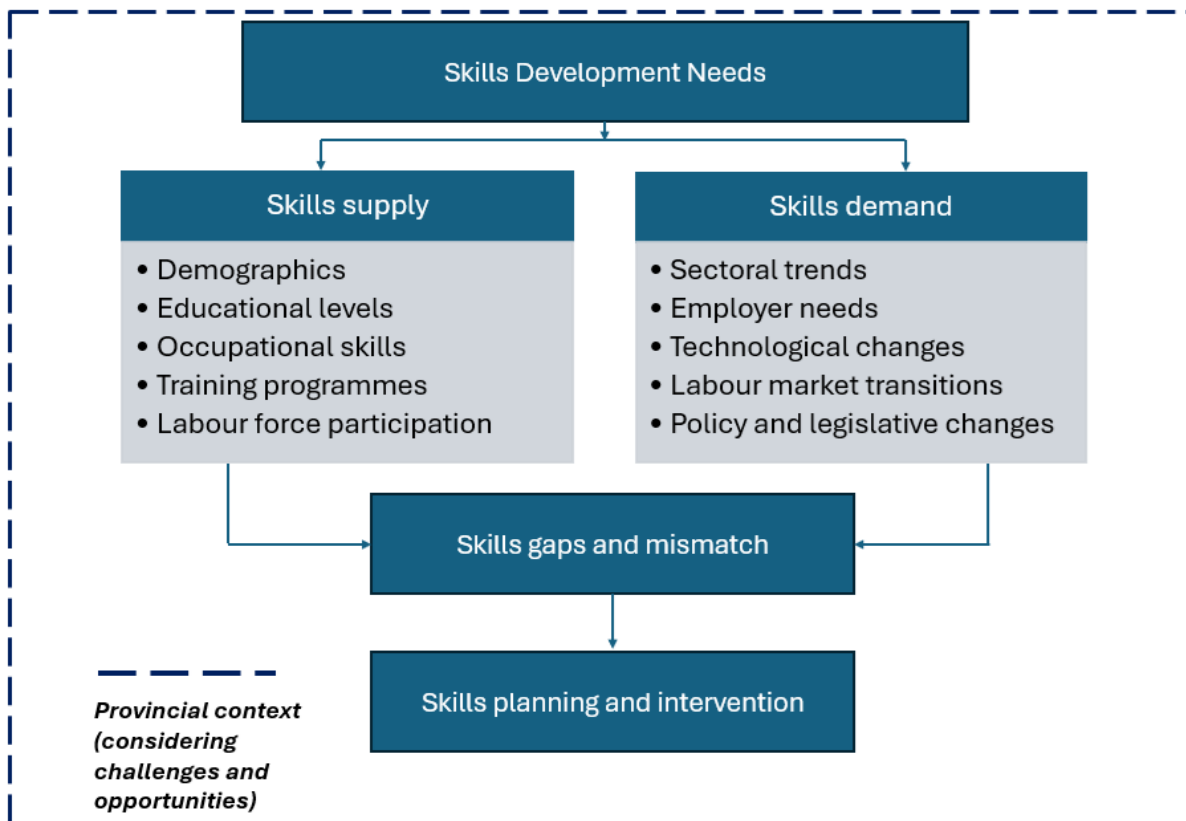


Figure 19: Framework for the analysis of skills supply, demand and mismatches

(Adapted from Department of Higher Education and Training, 2022)

Skills demand, on the other hand, is defined as “human resources and competencies required by employers at prevailing wages rates to meet their operational needs at a given point in time” (Department of Higher Education and Training, 2022:16). It reflects the current and future needs of the economy and employers – essentially, “what is required”. Several factors have a bearing on skills demand, and these include sectoral trends, employer needs, technological changes, labour market transitions, policy and legislative changes, amongst others.

The interaction between supply and demand may result in skills imbalances, which occur when there is a misalignment between the skills available and those required. These imbalances can manifest as skills shortages where demand exceeds supply as well as skills mismatch where available skills are inadequate relative to the job requirements (Department of Higher Education and Training, 2022).

Skills imbalances therefore highlights the need for skills planning and intervention. It is important to note that the analysis of skills supply and demand is embedded within the provincial context recognising that skills needs and labour market dynamics vary across regions. This localisation ensures that interventions are respond to the challenges and opportunities in the province.

3.3. Research design

A mixed method research approach was adopted for the study. This encompasses the use of both qualitative and quantitative research methods to respond to research questions (Kemper et al, 2003). This method is selected because it takes advantage of the strengths of various methods ensuring a well-rounded understanding of the issues being investigated. Its main benefit is that it can study a phenomenon from different perspectives leading to a comprehensive understanding of the subject matter.

Qualitative methods, as used in the study, are designed to gather non-numeric data which is critical in understanding the nuanced aspects of the research topic (Sardana et al, 2023). Quantitative methods, on the other hand, involve the collection of data (i.e., both numeric and categorical) that can be analysed statistically providing insights that are measurable (Sardana et al, 2023). Practically, this method is deemed suitable to provide understanding of skills development which is a multifaceted issue affecting different stakeholders. The use of a mixed method ensured that both the depth and breadth of the issue are explored, leading to broader understanding of the interventions needed to address the issues in Northern Cape province.

3.4. Data collection methods

Both primary and secondary data was collected in the study. The latter was collected through a systematic literature review. This is a process where relevant literature is identified, assessed and synthesised into different components of the study (Carrera-Rivera *et al*, 2022). The sources of data includes both published and grey literature with the latter encompassing unpublished reports obtained from different stakeholders such as the MQA, mining companies, local municipalities and others.

Primary data was collected through community surveys and key informant interviews. A total of 509 Participants completed the survey across five district municipalities in the province. Figure 20 shows the distribution of the responses. The participation rate is fairly consistent across the five district municipalities, ranging from 18% in ZF Mgcawu to 23% in Pixley ka Seme. This is important as it ensures balanced insights across the province. Data was collected in several locations, and these are Lime Acres, Postmasburg, Danielskruil, Barkley West, Greenpoint, Kimberley, Komaggas, Galeshewe, Phuthanang, Namakhoi, Carolusberg, Buffelsrivier, Namapeep, Kathu, Siyathemba, Mapotong and other areas.

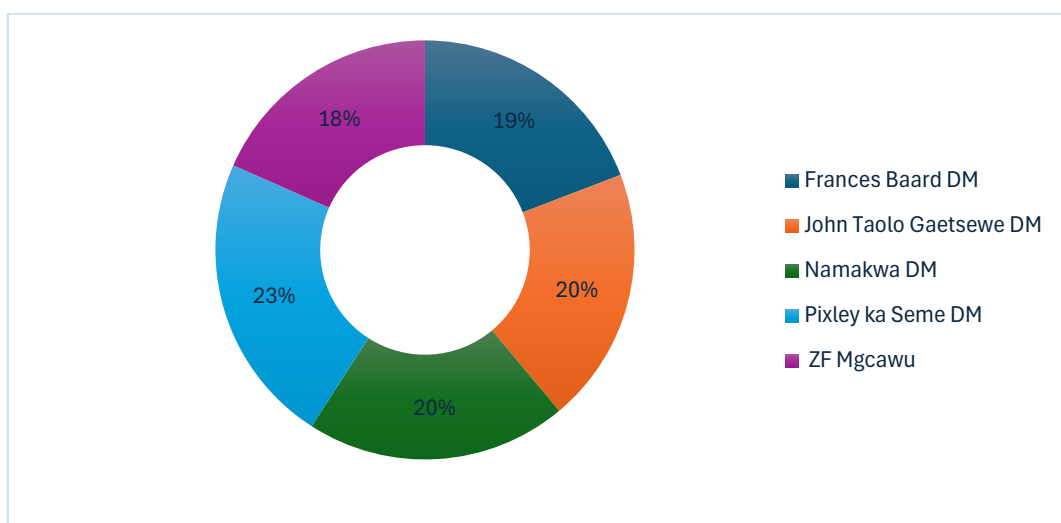


Figure 20: Distribution of survey participation rates across the province

Key informant interviews were conducted to complement the survey data and generate deeper insights into the province’s skills needs. The key informant interviews were held with community representatives, mining companies, and post-school education and training (PSET) institutions. Mining company representatives provided valuable perspectives on the specific skills required to support mining operations, existing skills gaps including hard-to-fill vacancies, economic opportunities that could be leveraged for skills development, and the range of skills development programmes available to surrounding communities, as well as key stakeholders and potential areas for collaboration.

Similarly, representatives from PSET institutions offered insights into the courses and training programmes they provide that align with the minerals and mining sector, programmes currently in high demand, the skills development needs required to support the broader

provincial economy, and the challenges and opportunities associated with expanding or strengthening skills development initiatives. They also highlighted relevant stakeholders and potential partnerships that could enhance programme delivery and relevance.

3.5. Data analysis methods

The quantitative data was analysed using Microsoft Excel to establish frequencies and percentages, providing insights into the distribution and trends within the data. The qualitative data was analysed content analysis where key themes were extracted as guided by the key questions that were posed.

3.6. Research reliability and validity

Research reliability and validity are important measures in research that ensure the quality and trustworthiness of the research and findings being presented (Kazman and Othman, 2016). Validity is concerned with the accuracy and the truthfulness of the findings whereas reliability is defined as the extent to which the results of the research can be reproduced when repeated under same conditions (Abowitz and Toole, 2010). There are various methods that can be used to establish validity and reliability of quantitative and qualitative research.

In this study, reliability and validity of the qualitative components of the study was established using the triangulation methods. Triangulation is a process where data from a research study is cross-referenced to ensure validity and reliability (Kazman and Othman, 2016). In this study, three triangulation methods were used. Specifically, data triangulation which involves the use of multiple data (i.e., primary and secondary data), investigator triangulation where multiple researchers collect and analyse the data (i.e., see project team in 7.2), and methodological triangulation which encompass the use of different approaches to collect and analyse data (i.e., see data collection methods) (Heale and Forbes, 2013).

3.7. Ethical considerations

The study was conducted in line with the University's research requirements. During the research, ethical requirements were followed. The key components of the ethics include:

- Risk level – The risk associated with the study is minimal. As defined by the University, minimal risk encompasses research where questions are posed about people's

everyday lives, activities and opinions rather than detailed demographic information. In the study, the participants will not be asked to provide personal information.

- Anonymity – This could not be guaranteed during data collection because of the sampling techniques and data collection methods that were used in the study. Anonymity was maintained in the final report. The study findings are presented in a generalised and aggregated format to protect participant identities.
- Confidentiality – The information collected during the data collection was not shared with anyone outside of the research team. Data has been securely stored and was analysed for this study.
- Consent - Informed consent was obtained from all participants prior to their participation in the study. Participants will be provided with information about the study and the nature of their participation. They were given an opportunity to ask questions and seek clarity on the aspects that were not clear. Both verbal and written consent will be sought from the participants.

3.8. Challenges encountered during the study

The main challenge encountered during data collection was a noticeable decline in participants' willingness to take part in the study. Several Participants expressed concerns about whether research outputs would translate into tangible benefits for their communities. In addition, many indicated that they had already participated in similar studies in the past and were therefore reluctant to engage again.

3.9. Conclusion

The purpose of the chapter was to discuss the methodology employed in the study. A mixed methods research design was adopted for the study, incorporating both quantitative and qualitative methods of data collection and analysis. Specifically, data was gathered through literature review, surveys and key informant interviews. The research was conducted in line with ethical requirements ensuring that consent was obtained from the participants prior to taking part in the study. Overall, the research design and supporting methods facilitated data collection and analysis that effectively addressed the study's objectives. The next chapter presents the results and discusses key findings emerging from the study.

4. RESULTS AND KEY FINDINGS

4.1. Introduction

This chapter presents the results of the study, organised into three main sections. The *first section* outlines findings related to the skills supply in the province. It includes an overview of Participant demographics, education levels, employment status, occupational skills need, and participation in training programmes. Understanding these aspects is critical for assessing the province's skills supply. In particular, the demographic and educational data help establish the profile of the available labour force. This indicates whether the province has a sufficient pool of skilled, semi-skilled, and unskilled individuals to support economic activities. Information on occupational skills needs reveals where shortages or gaps exist within the labour market.

The *second section* turns attention to skills demand, presenting insights on the specific skills required to support mining operations, existing skills gaps including hard-to-fill vacancies, economic opportunities available in the province, and the range of skills development programmes accessible to surrounding communities. Understanding the demand side is essential for determining how well the current skills supply aligns with industry and economic requirements, and for identifying priority areas where targeted interventions.

The *third section* brings these insights together by synthesising the supply and demand findings to identify key implications and priority areas for the province. This integrative analysis highlights where the most significant gaps lie, the opportunities that can be leveraged, and the strategic focus areas that should guide future skills development planning and intervention in the Northern Cape province.

4.2. Skills supply in the province

4.2.1. Demographics

The demographic information presented in this subsection includes gender and racial representation, age distribution, and educational attainment, including post-school education profiles. It also covers disability prevalence and the types of disabilities reported in the province.

Gender and racial profile

Figure 21 presents gender participation across the five district municipalities in the province. Overall, females accounted for 56% of all survey Participants, while males constituted 43%. The gender profile varies across the municipalities, with higher female participation recorded in Frances Baard, Namakwa, John Taolo Gaetsewe, and Pixley ka Seme District Municipalities, where female representation ranges from 51% to 61%. In contrast, ZF Mgqawu is the only district where male participation is higher, with men accounting for 51% of the participants in that area.

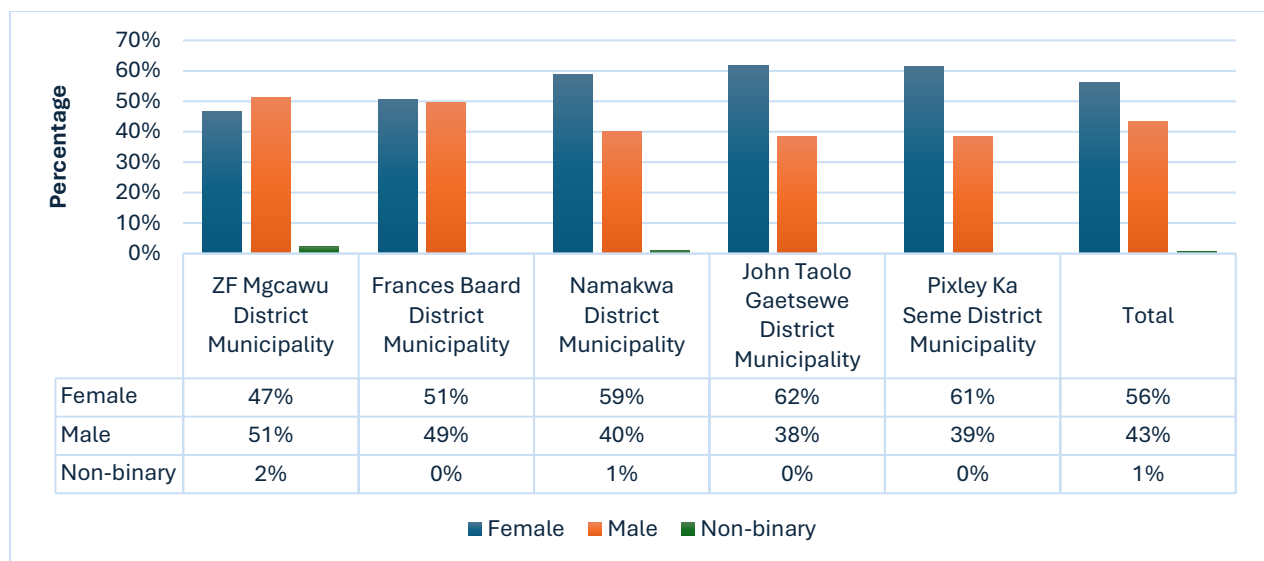


Figure 21: Gender distribution by district municipality in the province

Overall, there is adequate gender representation across the municipalities, which is essential for providing balanced insights on the skills needs of different cohorts. In terms of racial representation, 52% were Coloured and 48% were Black. This representation was expected as the two groups represent the largest percentages in the Northern Cape province.

Age distribution

Figure 22 illustrates the age distribution of participants across the province. Overall, the largest proportion of the participants falls within the 26 to 35 year age group, followed by those aged 36 to 44 years and the younger cohort aged 18 to 25 years. However, the age profiles differ across the five district municipalities. In ZF Mgqawu District Municipality, the 18 to 25 year cohort represents the largest share of Participants. In contrast, Frances Baard, Namakwa, and Pixley ka Seme District Municipalities show the highest participation among

individuals aged 26 to 35 years. In John Taolo Gaetsewe, the largest proportion of the participants is within the 36 to 44 year age group.

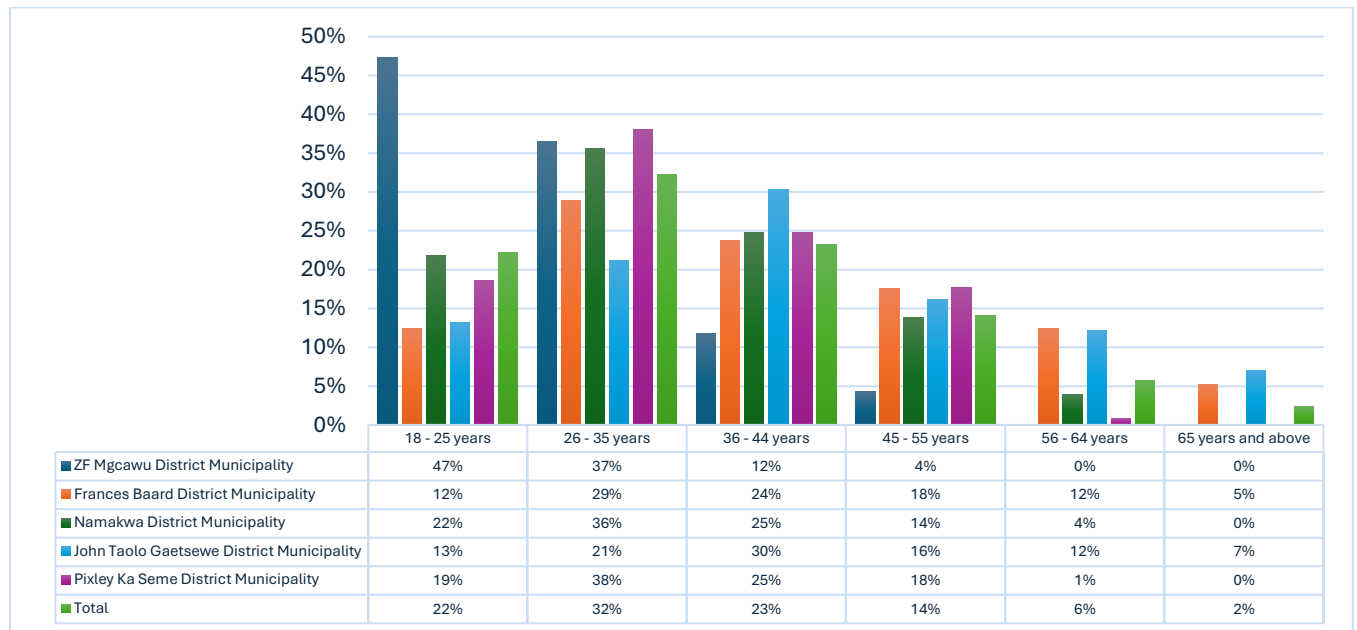


Figure 22: Age distribution

Overall, youth (i.e., 18 to 35 years) accounted for the largest percentage at 54%. The youth percentages across the district municipalities, ranges from 34% in John Taolo Gaetsewe to 84% in ZF Mgcawu. Again, there is good representation across the different cohorts.

Education levels

Figure 23 shows the combined education levels of the community members that participated in the study. As seen in the figure, about 36% of the participants have matric qualification. They are followed by those who have grade 10 and grade 11 (i.e., and equivalent phased of study). These two groups account for 16% and 14%. Only 10% of the participants have higher qualifications including Higher certificate, Diploma, bachelor’s degree, Honours degree and other qualifications.

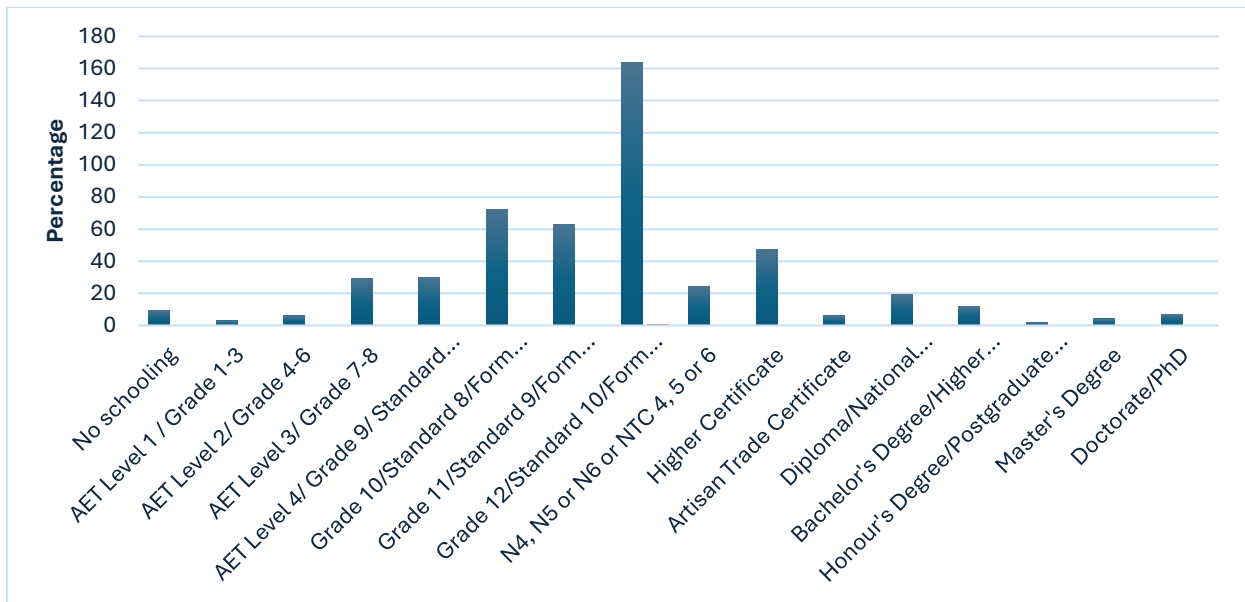


Figure 23: Education levels

Table 10 shows education levels across the five district municipalities capturing the percentages of those with matric, post-school qualifications and those without matric. Across the five district municipalities, educational attainment is uneven and suggests distinct skills supply profiles. Frances Baard and John Taolo Gaetsewe exhibit comparatively strong human-capital bases, with 41% and 47% of Participants respectively holding higher-education qualifications and relatively low “no matric” shares (20–24%). ZF Mgcawu shows a large pool of matric-holders (46%) and a moderate higher-education share (33%), indicating a strong pipeline for post-school upskilling.

In contrast, Namakwa and Pixley ka Seme show significant foundational gaps, with 60% and 69% of participants, respectively, reporting that they do not have a matric qualification, while higher-education attainment remains very low at 13% and 5%. These profiles point to serious concerns at the basic schooling level within the two district municipalities. They also indicate barriers that limit progression into post-school education and skills development, which need to be looked at.

Table 10: Education profiles of the five district municipalities

District municipality	Matric qualification %	No matric %	Higher education qualification %
ZF Mgcawu	46%	21%	33%
Frances Baard	39%	20%	41%
Namakwa	27%	60%	13%
John Taolo Gaetsewe	29%	24%	47%
Pixley Ka Seme	26%	69%	5%

These disparities carry clear implications for skills development planning. Districts like Frances Baard, John Taolo Gaetsewe, and ZF Mgcawu are well positioned for accelerated pathways into scarce and critical occupations through TVET diplomas, artisan training, technologist programmes, and work-integrated learning. Conversely, Namakwa and Pixley ka Seme require targeted foundational interventions—adult education and training to lift matric completion, bridging and remedial programmes in literacy, numeracy, and digital skills, and improved access to nearby TVET/PSET offerings via bursaries, mobile delivery, or partnership campuses. Prioritising “matric-to-qualification” conversion where the pipeline is strong, and foundational catch-up where it is weak, will help balance the provincial skills supply and improve throughput into employment.

Building from the education levels in the province, the participants were asked to provide the subjects that they completed in school (i.e., See figure 24). The data reveals a pattern that is inclined towards humanities and life-science subjects, with Life Sciences (Biology), Geography, and History being the most selected subjects. In contrast, subjects that serve as critical gateways to STEM and mining-related careers such as Mathematics, Physical Sciences, Engineering Graphics and Design, and Computer Applications Technology are chosen by a smaller share of learners. A higher percentage of the participants completed Mathematical Literacy compared to those who completed pure Mathematics. The reasons cited by learners for avoiding pure Mathematics are summarised in figure 25. These point to a combination of academic, pedagogical, and psychosocial factors.

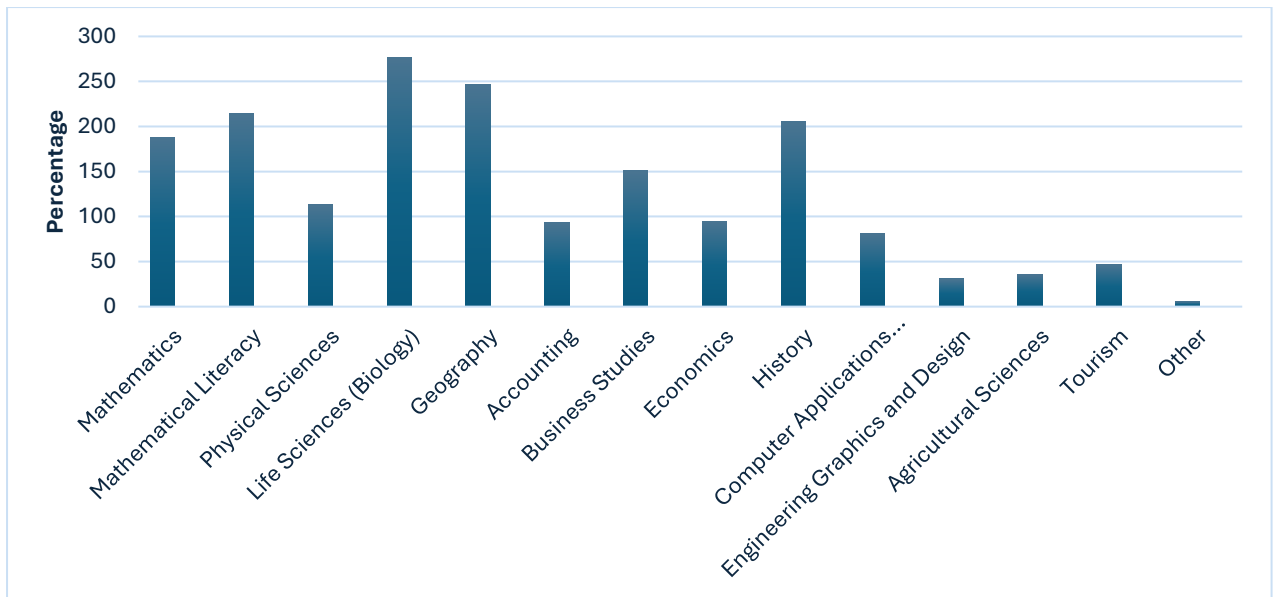


Figure 24: Subjects taken at school by community members

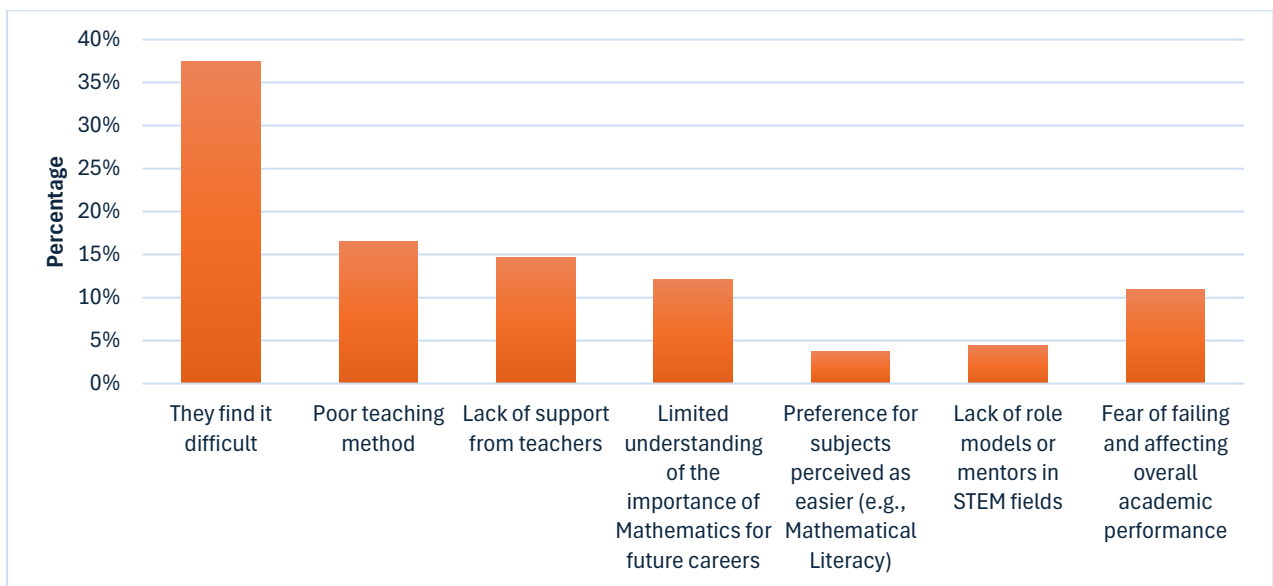


Figure 25: Reasons for not selecting Mathematics at school

The most dominant reason is that learners find the subject difficult, which indicates challenges with foundational numeracy skills or insufficient preparation at earlier schooling levels. Poor teaching methods and lack of sufficient support from teachers also feature strongly, highlighting the importance of teaching quality and learner support systems in shaping subject choices. Additional concerns, such as fear of failure and limited understanding of the importance of Mathematics for future careers, reflect gaps in both learner confidence and access to effective career guidance. As noted above, approximately 10% of participants

reported holding post-school qualifications. Figure 26 illustrates the broad disciplinary areas represented among these qualifications.

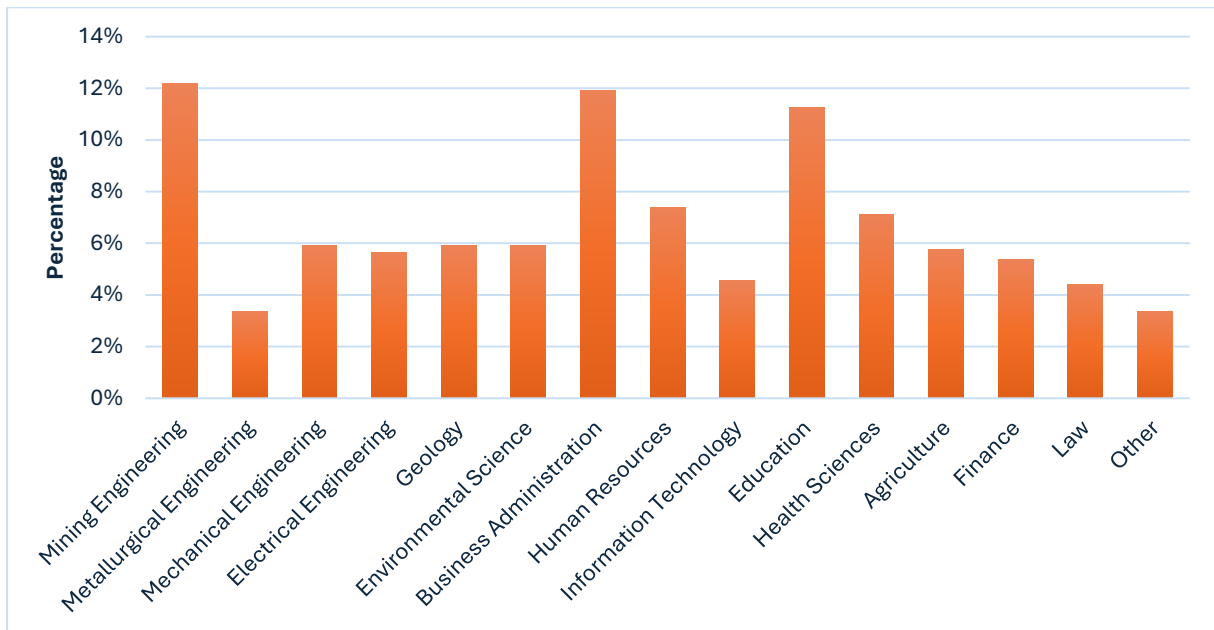


Figure 26: Post-school qualifications in the province

The distribution spans multiple fields, although representation in engineering and mining-related disciplines is moderate. The most common qualifications are in Mining Engineering, Business Administration, Education, Human Resources, and Health Sciences, reflecting a broad but relatively shallow skills base across sectors. A smaller share of participants holds technical qualifications in areas such as Mechanical Engineering, Electrical Engineering, Geology, Environmental Science, and Information Technology, indicating that pathways into specialised technical and engineering careers are not strongly established in the province. The comparatively higher prevalence of qualifications in non-technical fields such as Business, HR, Education, and Finance further suggests that learners are more likely to pursue administrative or service-oriented professions rather than occupations aligned to engineering or the mining value chain.

Key to the data collection was understanding *why individuals with a matric qualification choose not to pursue higher education* (i.e., See figure 27). The barriers preventing matriculants from pursuing higher education are mostly financial and socio-economic in nature. Lack of access to funding or bursaries is the most reported obstacle, signalling that

affordability remains a major challenge for young people seeking post-school opportunities. Many participants also cite poor academic performance and the need to work to support their families, reflecting the socioeconomic pressures that often divert individuals away from continued study. Limited availability of higher-education institutions in close proximity adds a spatial dimension to the constraints experienced by learners, especially those in remote or rural areas.

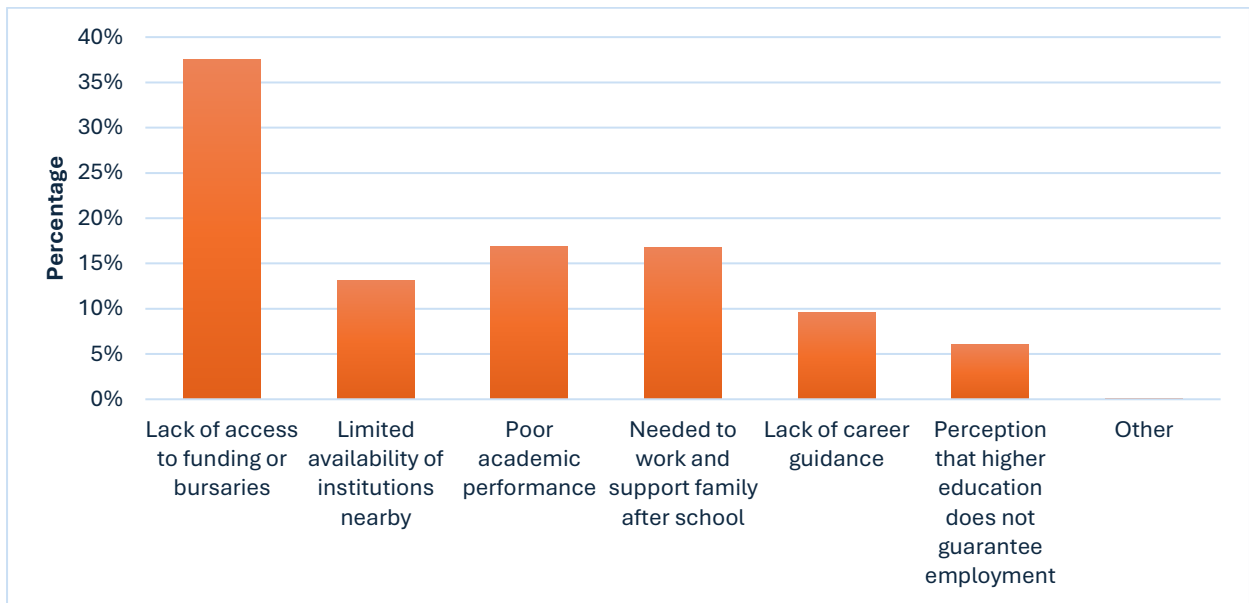


Figure 27: Factors hindering post-school progression

The participants were asked about the type of support that matriculant need to pursue higher education (i.e., See figure 27). The support measures identified encompass mostly financial assistance (i.e., bursaries) and career guidance. Additional support needed is mentorship from graduates and/or professionals, and community awareness programmes. Improved access to application platforms also emerged as a need, indicating potential challenges with digital access.

Disability status

As part of developing the demographic profile of communities in the province, participants were asked whether they were living with a disability. Overall, 7% of participants reported having a disability, with the most cited types being mobility impairments and developmental disabilities.

4.2.2. Employment status

Part of the study was to establish employment levels in the province, and these are shown in figure 28. Across the province, the largest single category is “unemployed and looking for work” (39%), followed by employed part-time (27%) and employed full-time (21%); self-employment is low (6%), with students (4%) and retirees (2%) comprising the smallest shares.

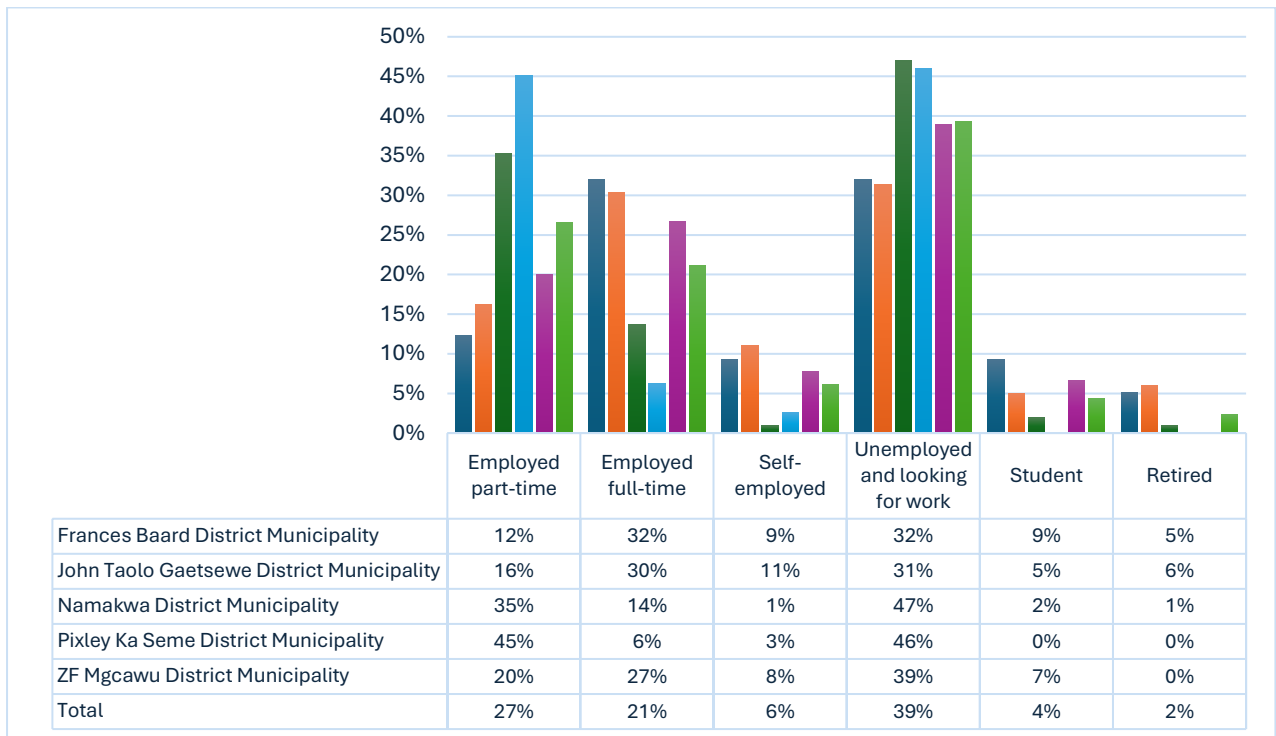


Figure 28: Employment levels in the province

The following are observed across the district municipalities:

- Pixley ka Seme has the highest unemployment (46%) and the highest part-time share (45%), while full-time work is very limited (6%).
- Namakwa similarly shows high unemployment (47%) and better part-time (35%), with very low full-time (14%) and minimal self-employment (1%) suggesting few entrepreneurial opportunities.
- Frances Baard and John Taolo Gaetsewe show lower unemployment (~32%) alongside comparatively higher full-time employment (~30 and 32%), indicating relatively stronger absorption into stable jobs.
- ZF Mgcau sits between these poles with unemployment at 39%, full-time at 27%, and part-time at 20%.

Overall, labour demand appears uneven across districts, with Pixley ka Seme and Namakwa facing challenges affecting employment, and Frances Baard/John Taolo Gaetsewe offering relatively better prospects for full-time work. The low self-employment shares in most districts imply barriers to small-business development in the province, especially in Namakwa.

Employment by economic sector

Figure 29 the economic sectors in which those employed (i.e., part-time and full-time) are working. As can be seen, Agriculture accounts for 5%, while Manufacturing and Tourism are very small (each less than 1%). This profile indicates a labour market anchored by the public sector, with mining as the leading private-sector employer among participant, and manufacturing as well as tourism playing a minimal role. The majority of those employed (i.e., 94%) are working in the Northern Cape province.

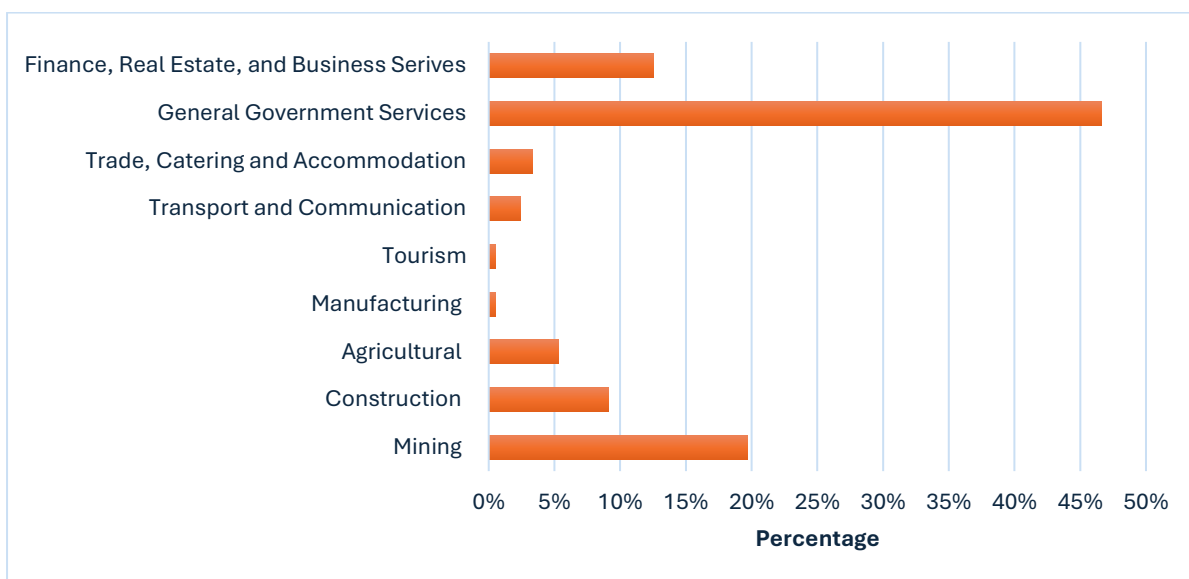


Figure 29: Economic sectors of employment

Sectors of self-employment

Within the (small) self-employed group, Other categories (Mining, Manufacturing, Transport & Communication, Trade/Catering/Accommodation, Government) are each 5%, and Tourism registers 0% (i.e., See figure 30). This suggests that entrepreneurship in the province is service-oriented.

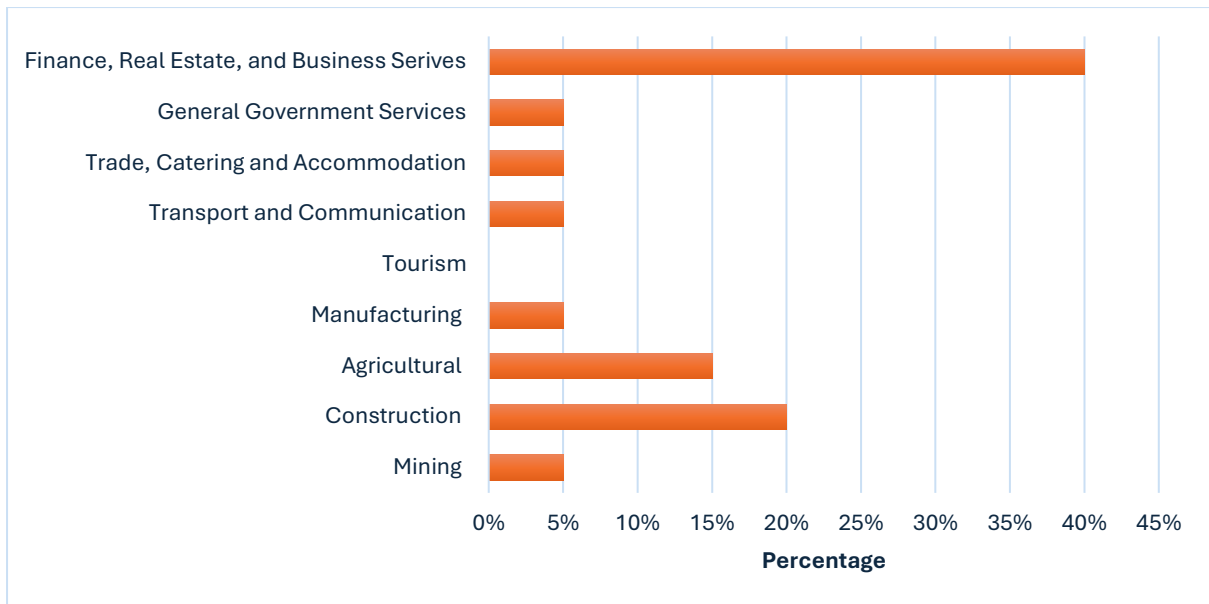


Figure 30: Sectors of self-employment

Source of income amongst community members

Figure 31 depicts the sources of income in the province. The income sources are led by social grants (49%), which is followed by salary at 43%. Only 7% of the income is generated through business. Overall, social protection is the single largest reported income source, exceeding wage income and business earnings among participants.

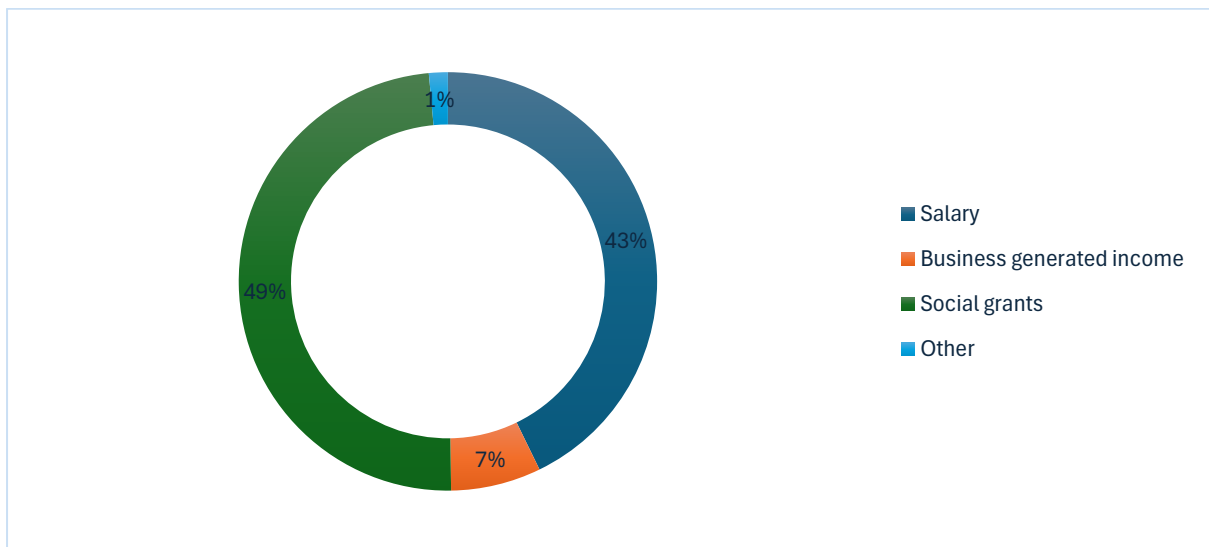


Figure 31: Sources of income in the province

4.2.3. Establishing skills needs of the community members

Skills needed by community members

This section outlines the skills required for meaningful participation in the mining and minerals sector. Figure 32 summarises the responses from participants, highlighting five priority skills: Mining Engineering (13%), Electrical Engineering (11%), Boiler making (10%), Occupational Health and Safety (10%), and Mechanical Engineering (9%). While the specific skills need vary across district municipalities, Mining Engineering consistently emerged as a high-priority skill in all five districts, underscoring its central importance to the sector in the province.

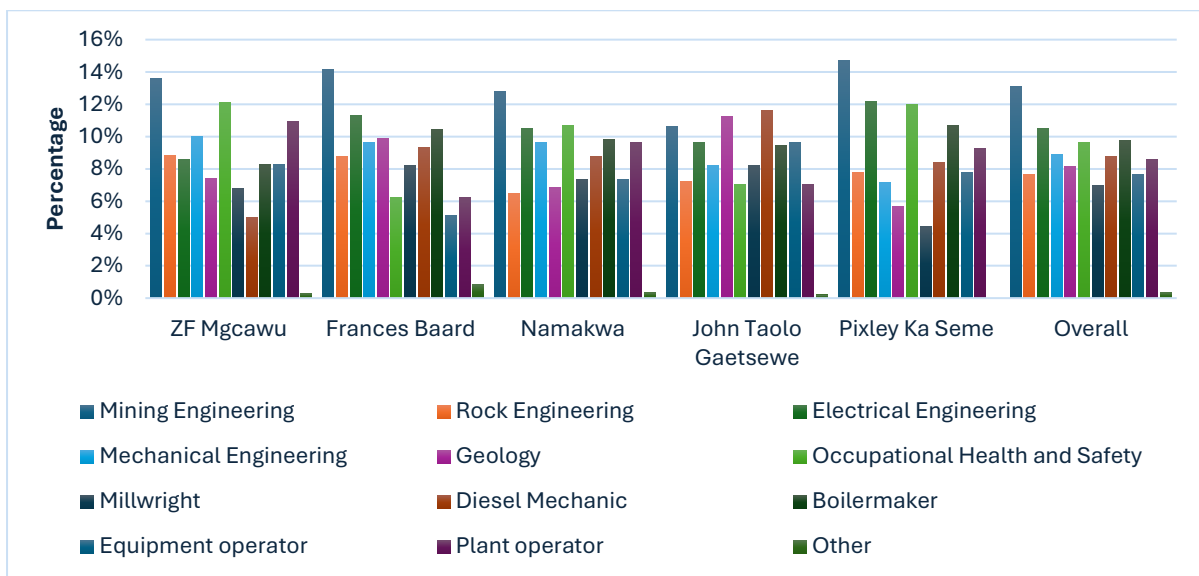


Figure 32: Skills needed by communities to participate in MMS

The participants were asked to list specific skills and there are captured in figure 33.

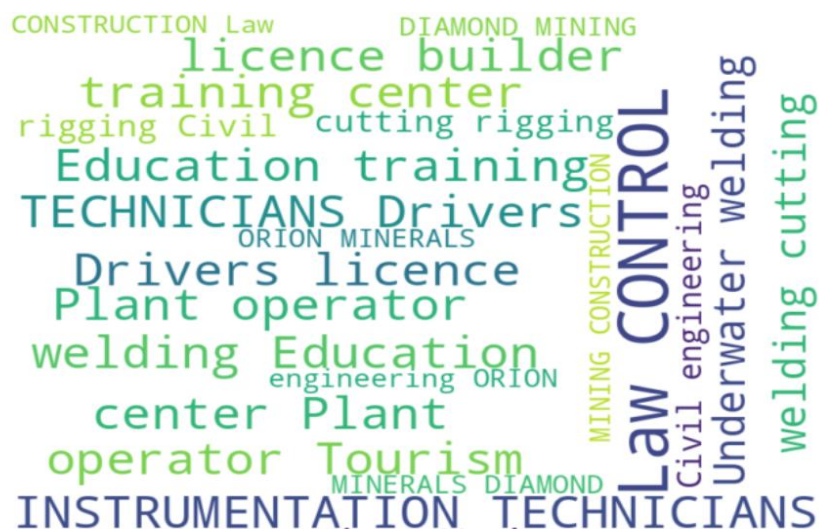


Figure 33: Specific skills needs of communities in the province

Emerging skills in the province

Part of the study was to establish community awareness of emerging skills, particularly those associated with technological advancements in the MMS. Participants were first asked whether they were familiar with the concepts of Fourth Industrial Revolution (4IR) technologies, automation within the mining sector, and renewable energy. As illustrated in Figure 36, levels of awareness vary considerably.

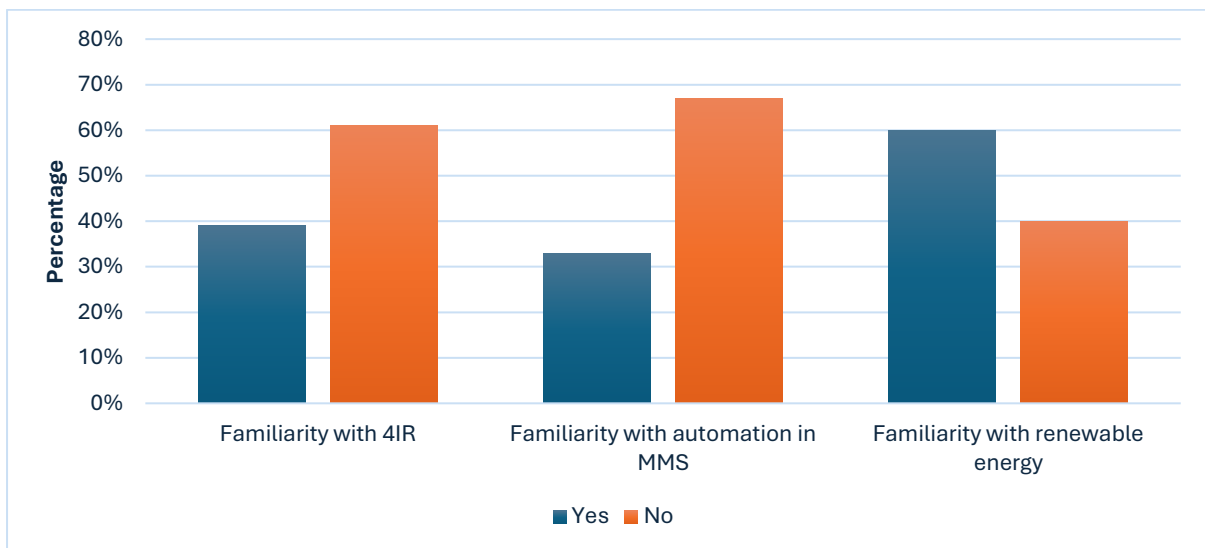


Figure 36: Familiarity with 4IR, automation and renewable energy

Familiarity is limited for 4IR (39% “Yes”, 61% “No”) and automation in the MMS (33% “Yes”, 67% “No”). By contrast, the level of awareness on renewable energy is high amongst community members with 60% responding “Yes”. Taking from this, the participants were asked about skills needed to access opportunities provided by renewable energy projects (i.e., See figure 37).

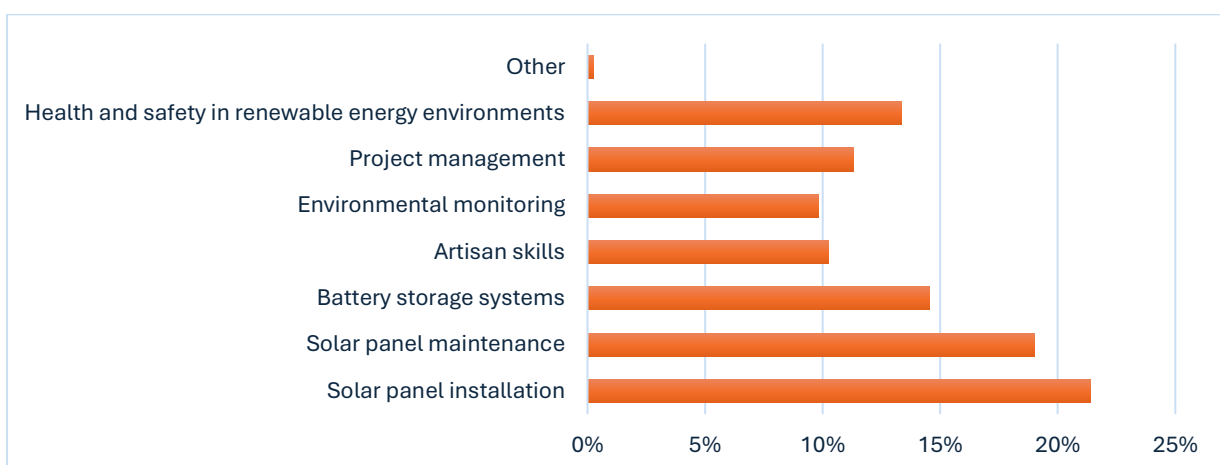


Figure 37: Skills needed to access opportunities in renewable energy

The most cited skills are solar panel installation (21%), solar panel maintenance (19%) and battery storage systems (15%). The other key skills are artisan skills, health and safety and project management.

Key economic sectors and cross sector skills

In addition to the MMS and emerging industries, the province’s economic landscape includes several sectors that present opportunities for community participation. In ZF Mgcawu, agriculture and construction emerged as the two dominant sectors. In Frances Baard, agriculture, construction and renewable energy constitute the top three sectors. A similar pattern is observed in Namakwa, John Taolo Gaetsewe, and Pixley ka Seme, where agriculture, construction and renewable energy are identified as the key sectors offering viable economic opportunities within the province.

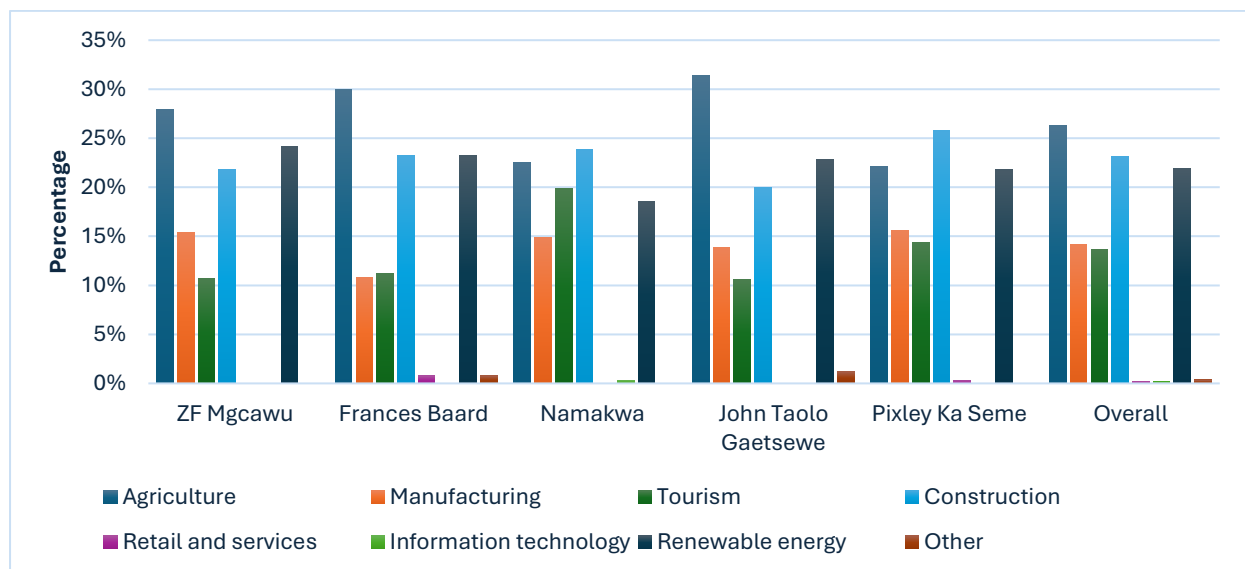


Figure 38: Key economic sectors in the province

Participation in these sectors requires a set of cross-cutting competencies that enable individuals to engage in diverse economic activities. The study identified several critical skills that would support economic participation across the province. Safety and health practices (26%) ranked highest, followed by project management (23%) and digital literacy (18%). The additional skills included leadership and supervision (12%), equipment operation and maintenance (11%), and financial management (10%). Similar profiles are seen in all district municipalities.

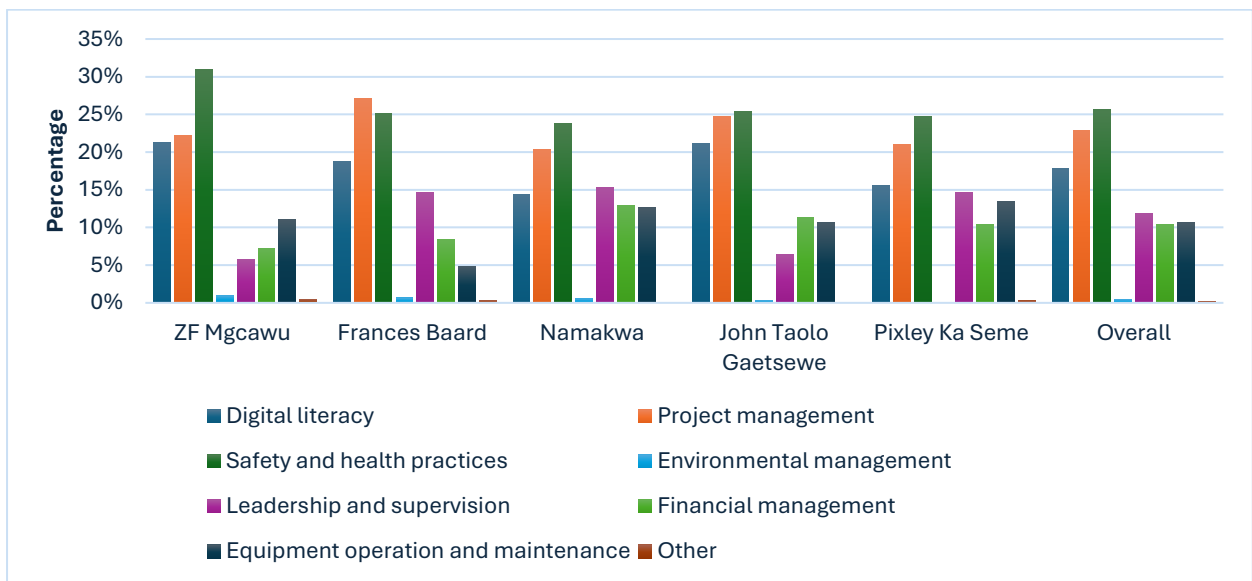


Figure 39: Cross-sector skills needs in the province

Entrepreneurship opportunities in the province

Several questions were posed to participants to assess perceptions of entrepreneurial and small-business opportunities within the province. As illustrated in figure 40, when asked whether opportunities exist to support small businesses, 61% of Participants indicated “Yes,” while 39% responded “No.” However, these perceptions vary across district municipalities. A substantial proportion of community members in Frances Baard, John Taolo Gaetsewe, and ZF Mgcawu believe that their municipalities offer meaningful opportunities for entrepreneurship and small-enterprise development. By contrast, responses in Namakwa and Pixley ka Seme are more evenly split.

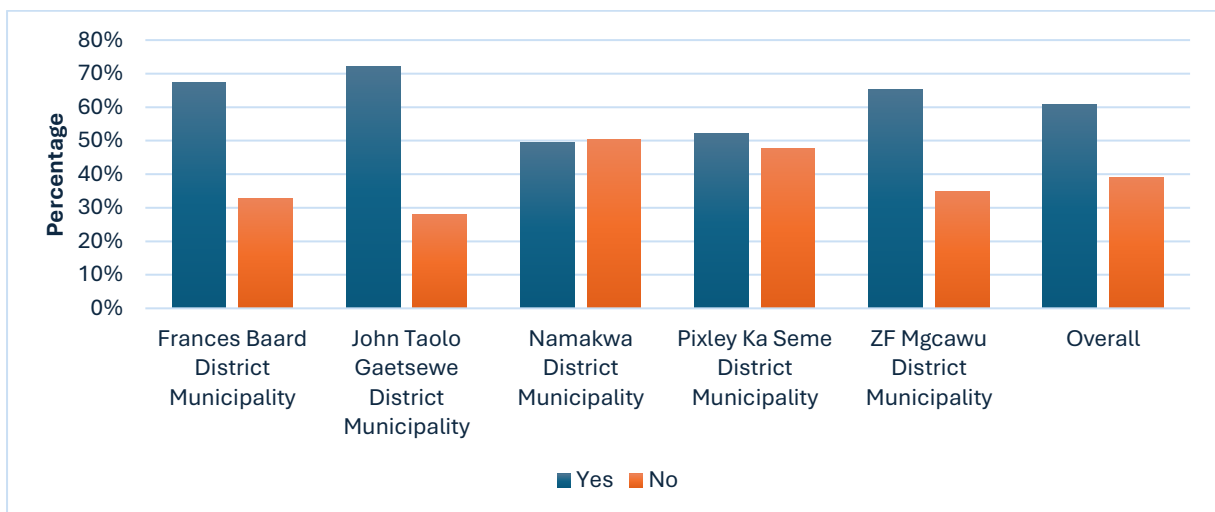


Figure 40: Perceptions of entrepreneurial and small-business opportunities within the province

The perceived opportunities in the province are captured in figure 41, and these cluster around retail (24%), services (23%), and agriculture (18%), with meaningful but smaller niches in renewable energy (11%), mining-related services (10%), manufacturing (7%), and ICT/digital services (7%).

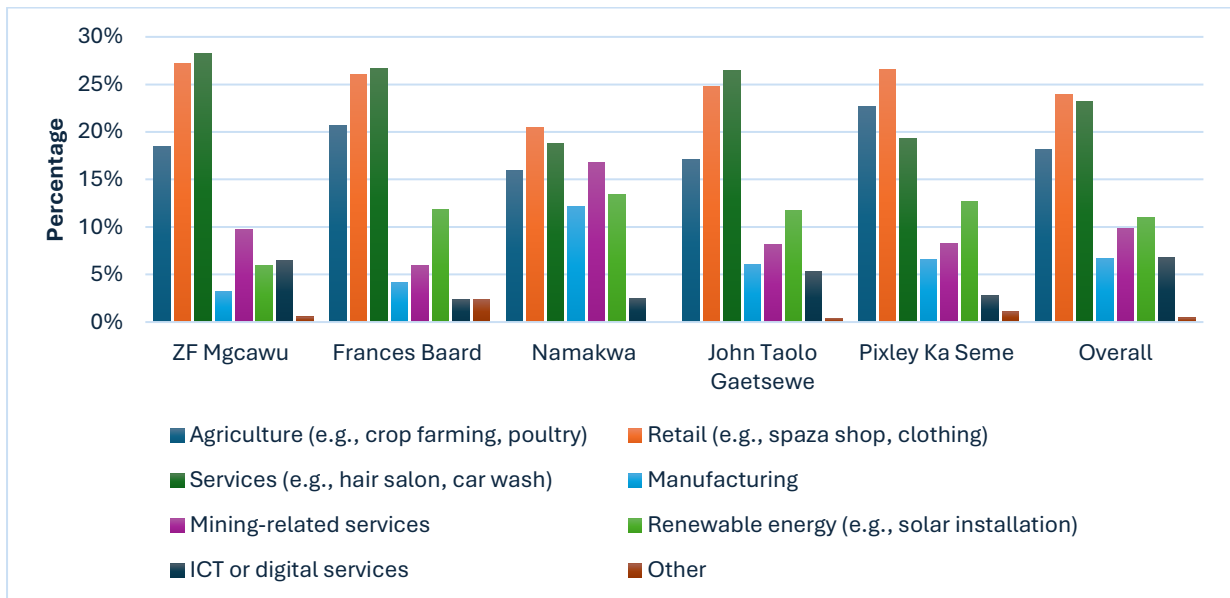


Figure 41: Perceived economic opportunities to support small businesses in the province

Several challenges were raised by the participants which hinder both the establishment of new enterprises and the performance of existing small businesses. These are illustrated in Figures 42 and 43. Across the province, the most significant barrier reported is a lack of capital or funding, and following closely is insufficient business skills or knowledge.

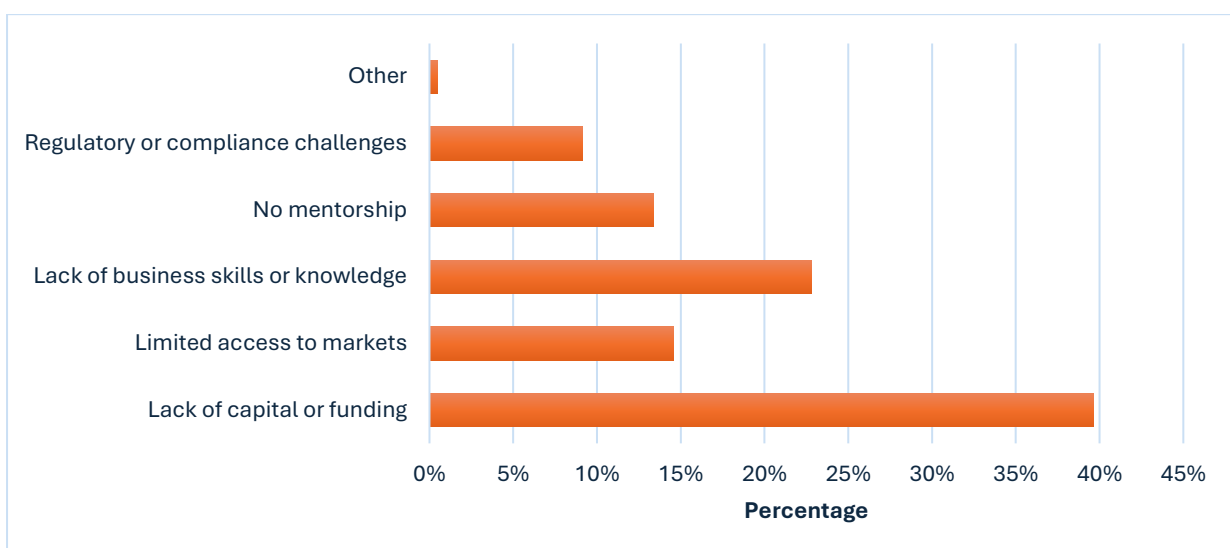


Figure 42: Factors affecting the establishment of small businesses

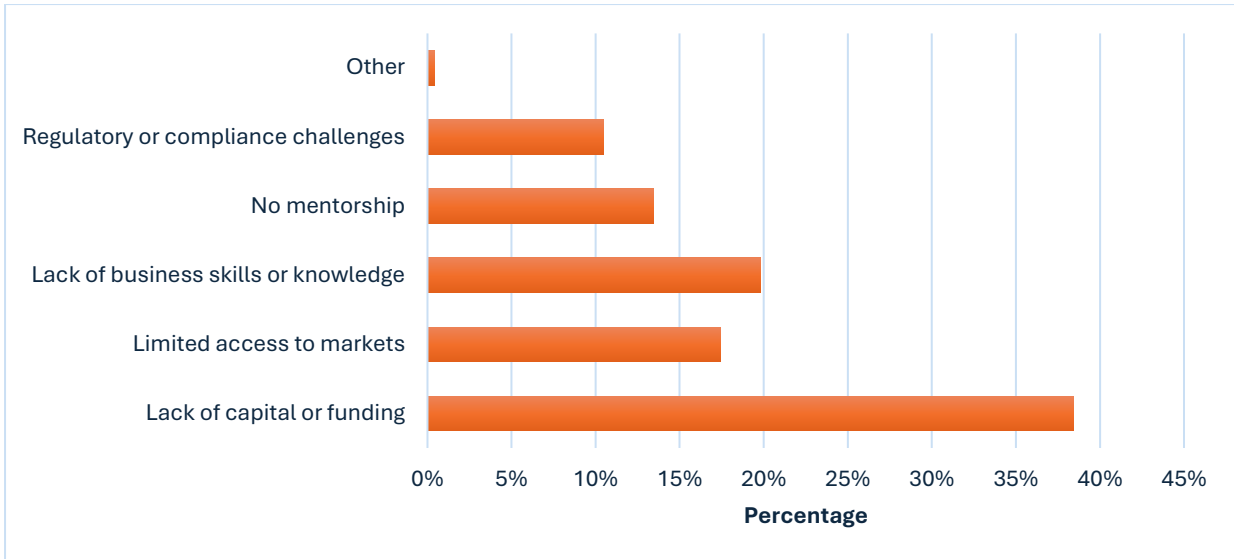


Figure 43: Factors affecting the performance of existing small businesses

Figure 44 shows the skills needed to support entrepreneurship in the province. The following skills were identified, business skills (21%) and financial management (21%), marketing (18%), leadership (15%), communication (14%), and digital skills (13%).

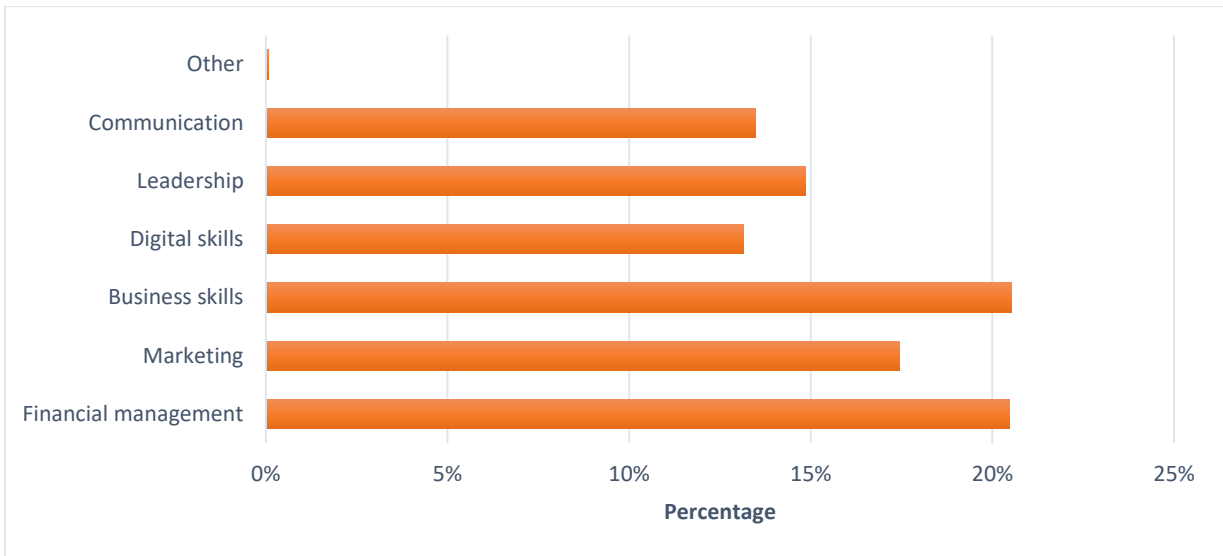


Figure 44: Entrepreneurial skills needed by community members

4.2.4. Skills development and training programmes

Several questions were posed to gather the perspectives of community members on the skills development and training programmes implemented in the province. This was done to assess the effectiveness of these programmes in addressing the skills needs of the communities. Additionally, specific questions were directed at community members to solicit their views on the MQA and its role in skills development within the mining sector.

The participants were asked whether they are aware of any mining-related training available in their communities. Only 13% answered “Yes” while the majority (87%) said “No,”. This represents a negative awareness gap of –74 percentage points. As seen on figure 45, the level of awareness is low across all municipalities.

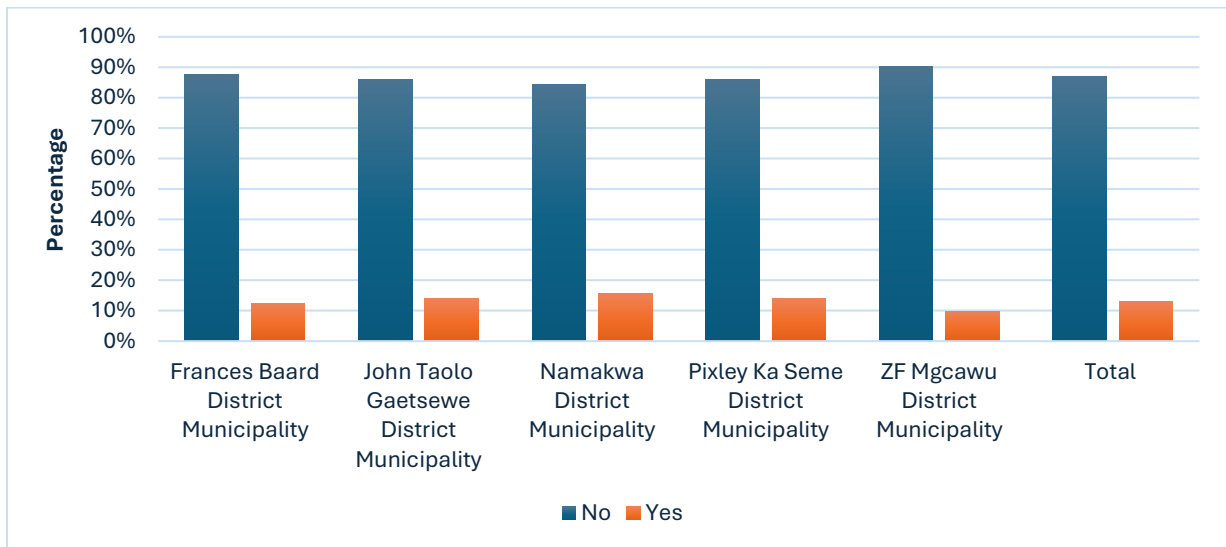


Figure 45: Awareness of mining-related training programmes in the province

Another question posed was on the accessibility of training programmes and most participants perceive training as hard to access with 43% rating access “very difficult” and 26% “difficult”. Only 10% said “accessible” and 2% easy (i.e., See figure 46).

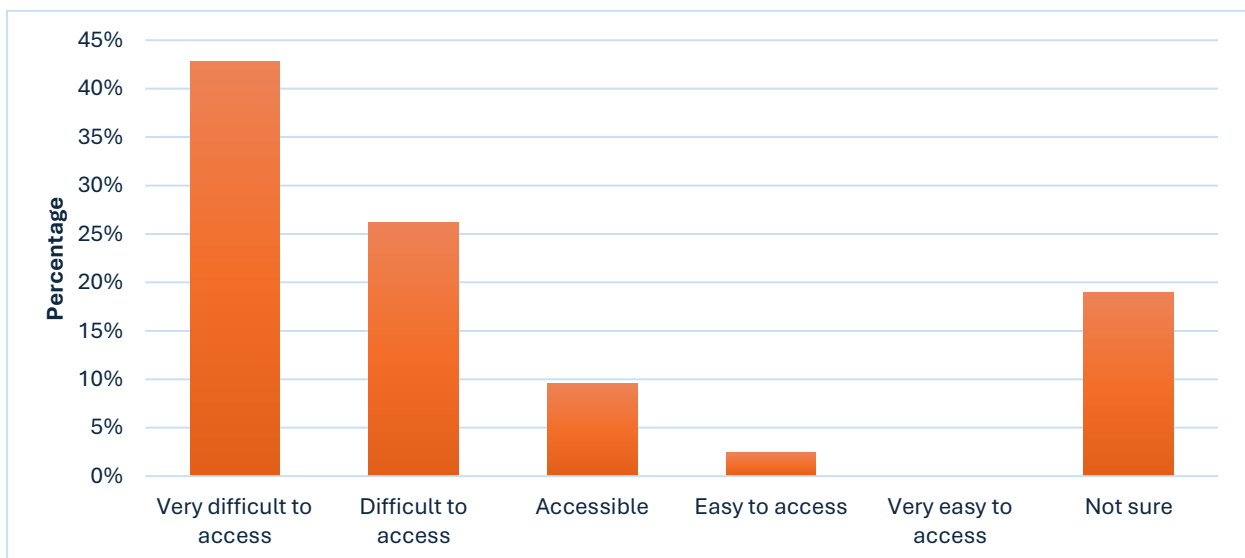


Figure 46: Communities' perception on the accessibility of training programmes

Several barriers affecting participation in training programmes were identified, as shown in Figure 47. When aggregated across districts, the leading barrier is lack of information about training opportunities (25%), followed by age restrictions (18%) and distance to training

centres (16%). The lack of information emerges as the main constraint in Namakwa, Pixley ka Seme and ZF Mgqawu district municipalities. In Frances Baard and John Taolo Gaetsewe, age restrictions were ranked high.

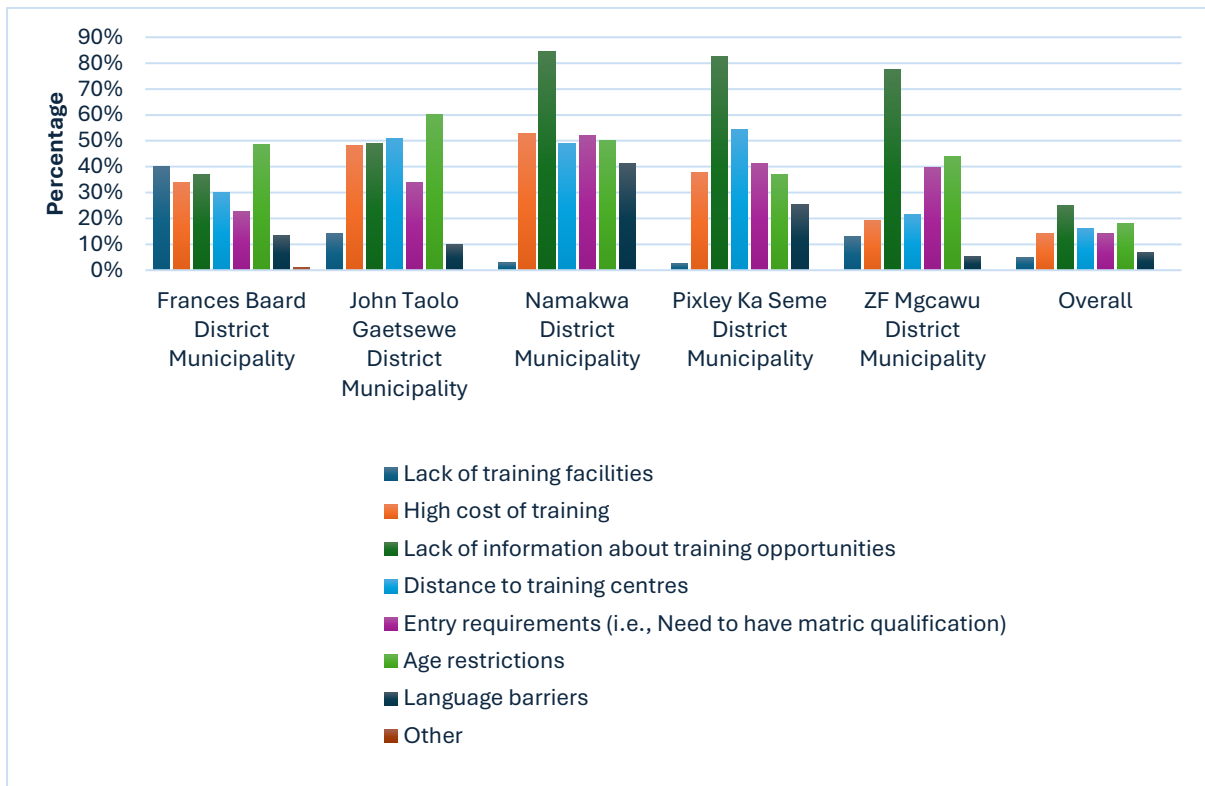


Figure 47: Barriers of entry when accessing training programmes

When asked where skills initiatives should concentrate, participants ranked high the following: preparing youth for mining careers (37%), upskilling current mining workers (23%) and supporting local businesses that serve the mining sector (21%) (i.e., See figure 48). The top two focus areas across district municipalities are as follows.

- ZF Mgqawu –preparing youth for mining careers and developing alternative skills for economic diversification
- Frances Baard - preparing youth for mining careers and supporting local businesses
- Namakwa - preparing youth for mining careers, supporting local businesses and developing alternative skills for economic diversification
- John Taolo Gaetsewe and Pixley ka Seme - preparing youth for mining careers and upskilling current mining workers

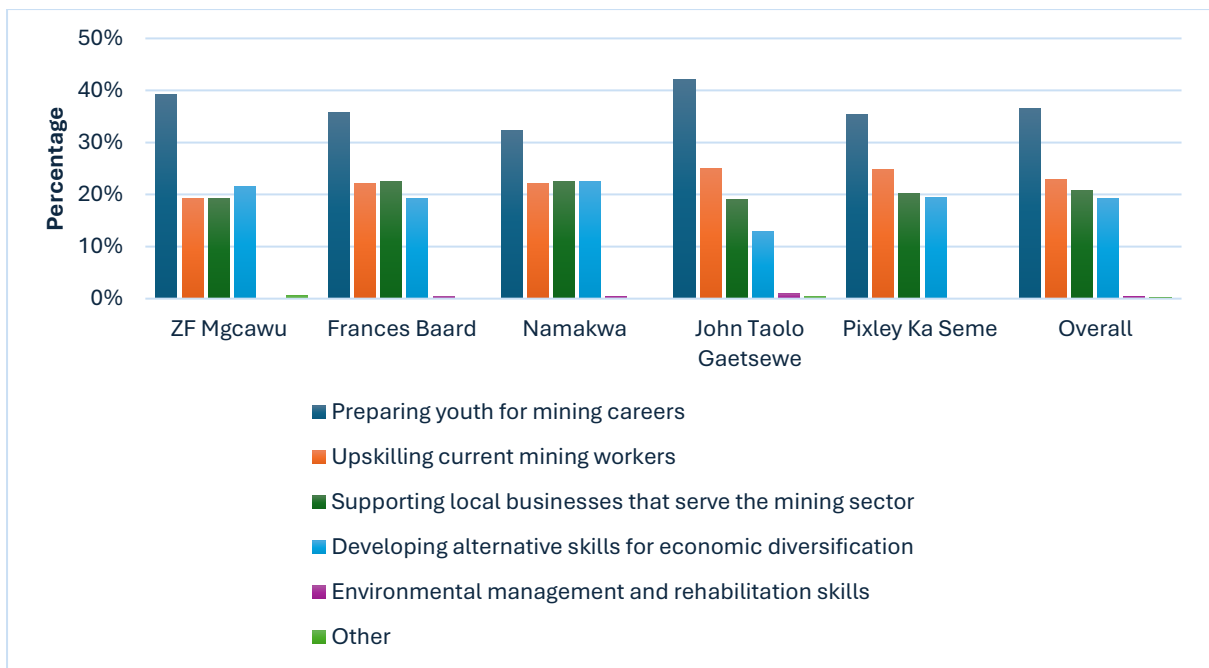


Figure 48: Priority areas for skills development in the province

The final section presents insights into community familiarity with the MQA, awareness of MQA-supported training programmes, levels of participation in these programmes, and the key areas identified by participants for improving MQA’s training offerings. The findings indicate low levels of familiarity with the MQA across the province (i.e., See figures 49). Overall, 73% of participants shared that they are not familiar with the work of the MQA, while only 17% say they are familiar, and 10% are somewhat familiar. District comparisons reveal slight variations. ZF Mgcawu recorded the highest share of participants familiar with the MQA (34%), followed by John Taolo Gaetsewe (23%). In contrast, familiarity is lower in Frances Baard (16%), Namakwa (14%), and Pixley Ka Seme (3%).

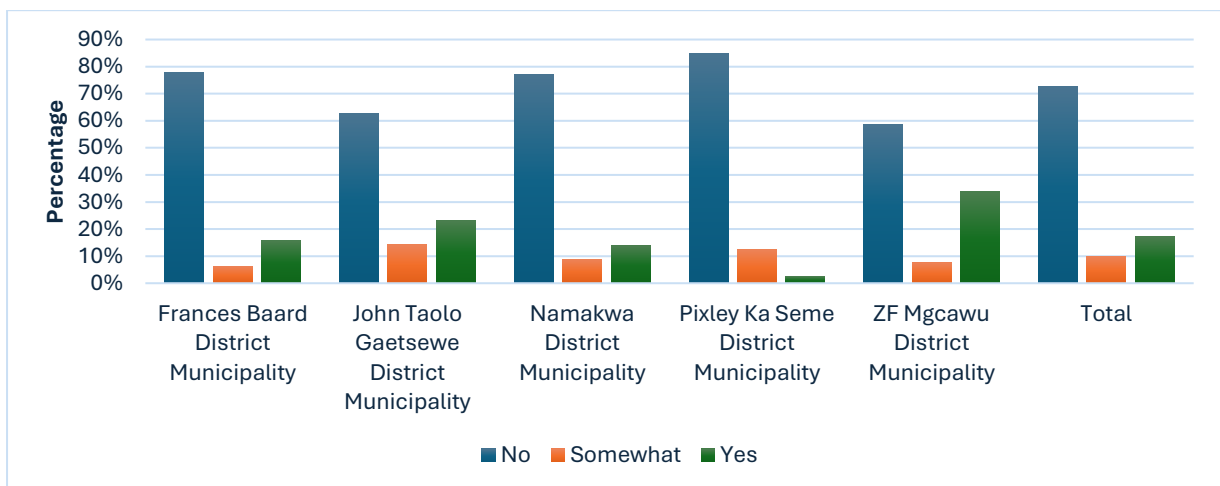


Figure 49: Levels of familiarity with MQA

Participants were also asked whether they, or anyone in their household, had ever taken part in an MQA training programme. Only 4% of Participants reported that someone in their household had participated in an MQA training programme, while 85% said “No” and 11% were “Not sure”. Participation is highest in ZF Mgcawu (14%), followed by Namakwa (4%), John Taolo Gaetsewe (2%), and Frances Baard (1%). Pixley Ka Seme recorded the lowest participation.

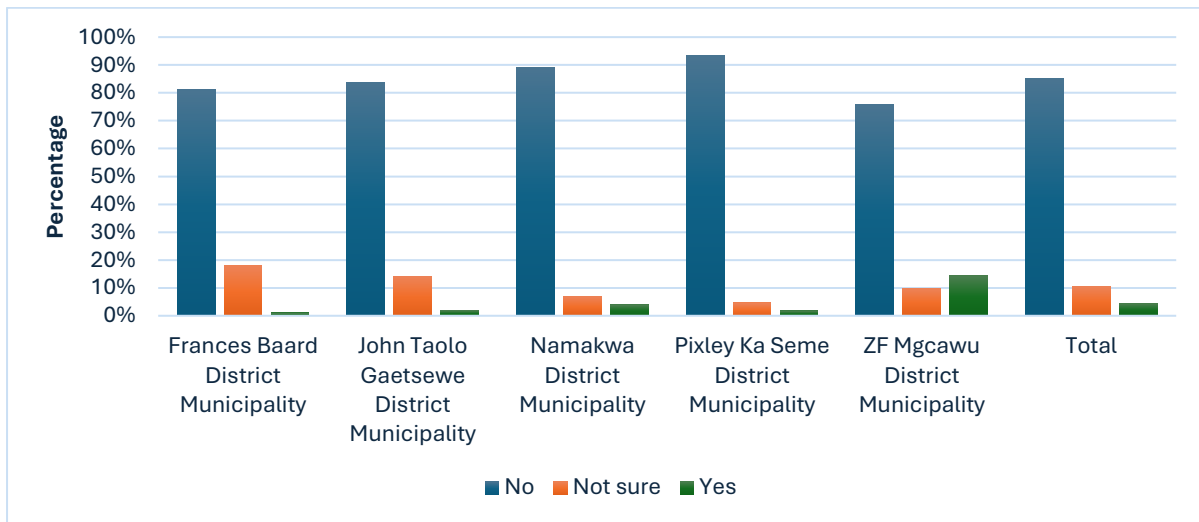


Figure 50: Participation in MQA supported programmes

In soliciting these insights, the community members suggested several areas of improvement that MQA should look at. The most cited improvement is better communication about available programmes (37%), followed by more variety in training programmes (29%). Additional priorities include better alignment with job market needs (18%) and an easier application process (16%).

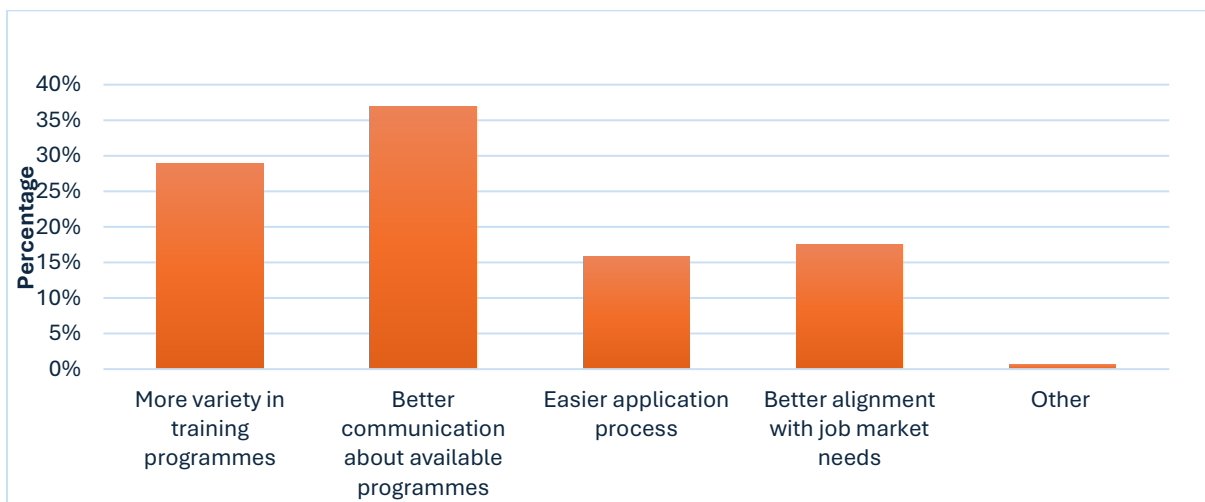


Figure 51: Suggested areas of improvement

4.2.5. Key insights from interviews with community representatives

The following insights were derived from interviews with community representatives operating within mining-affected communities and related local economic contexts in the Northern Cape:

- Community representatives consistently highlighted a structural disconnect between local skills supply and industry demand, driven by the limited availability of tertiary and technical institutions offering mining- and energy-relevant qualifications within the province. As a result, local youth are often compelled to leave the province for training, while companies recruit skilled labour from outside the region. This finding aligns with provincial labour market data showing low levels of post-school education attainment and limited access to specialised vocational training in the Northern Cape.
- Mining remains the dominant economic driver, with ongoing demand for skills such as heavy machinery operators, engineering support roles, and technical specialists linked to large-scale operations. At the same time, Participants noted the rapid expansion of the renewable energy sector, particularly solar and wind projects, which is generating new demand for electrical skills and the maintenance of modern, computerised equipment. However, the local skills base has not yet adapted to meet these emerging requirements, despite policy emphasis on aligning skills development with the green economy and critical minerals value chains.
- Community representatives emphasised that local business participation in mining and infrastructure supply chains remains constrained. While subcontracting opportunities exist, local SMMEs are often limited to low-capital activities due to insufficient access to heavy machinery, technical capacity, and start-up finance, restricting their ability to compete for larger contracts. This mirrors broader provincial development priorities that identify skills development and enterprise support as key enablers of inclusive economic participation.
- Socio-economic vulnerabilities among youth were identified as a significant barrier to skills development. High unemployment levels are compounded by school dropout rates, substance abuse, and limited financial resources, which collectively reduce young people's ability to access post-school training even when opportunities are available. These challenges are reflected in provincial labour statistics, which indicate

a high proportion of semi-skilled and low-skilled workers and limited progression into higher-level qualifications.

- Concerns were raised about the long-term sustainability of the provincial economy, particularly in relation to mine closure and post-mining livelihoods. Community representatives stressed the importance of diversifying skills development beyond mining to include sectors such as agriculture and tourism, leveraging underutilised land, water resources, and local heritage assets to support future economic resilience. This aligns with provincial development strategies that emphasise economic diversification and resilience as core priorities.
- Participants highlighted the need for earlier and more structured skills pipelines, recommending stronger linkages between secondary schools and industry. Initiatives that identify learners from Grade 10 onwards and support them through targeted training and workplace exposure were viewed as critical to improving local absorption into mining and energy-related employment. Existing policy initiatives targeting school-to-work transitions underscore the importance of early intervention in addressing long-term skills shortages.

4.3. Skills demand and industry needs

This section presents an analysis of the Workplace Skills Plan (WSP) and Annual Training Reports (ATRs) data, focusing on hard-to-fill vacancies, top-up skills, and community training programs. Hard-to-fill vacancies are defined as "occupations that an employer was unable to fill within 12 months or took longer than 12 months to find a suitably qualified and experienced candidate" (DHET, 2019, cited in MQA, 2023). In contrast, top-up skills refer to skills gaps that typically require short training interventions (DHET, 2019, cited in MQA, 2023).

Both hard-to-fill vacancies and top-up skills highlight skills gaps and serve as proxies to understand the skills demand in the mining sector. Additionally, the training programmes implemented by mining companies indicate priority areas for training, thereby reflecting the demand for specific skills. By analysing these programmes, the areas where training is needed can be identified to meet the industry's requirements and align them with the skills needs of the community.

4.3.1. *Hard to fill vacancies*

Table 11 outlines the occupations identified by mining companies in the Northern Cape province as hard-to-fill vacancies. The highlighted occupations were reported by at least two mining companies, indicating a consistent challenge in sourcing qualified candidates for these positions. The top three occupations most frequently cited as difficult to fill are: Auto Electrician, Diesel Mechanic, and Section Engineer. These roles are critical for the maintenance, engineering, and operational functions of mining operations.

Table 11: Hard-to-fill vacancies in the MMS in Northern Cape province

Specialisation/Occupation	OFO Code	Reasons for difficulties in recruitment
Auto Electrician	2021-671208	Lack of relevant qualifications, lack of relevant experience, unsuitable job location, equity considerations, poor remuneration, unsuitable working hours, slow recruitment processes, new or emerging job not defined before
Diesel Mechanic / Field Service Technician (Diesel)	2021-653306	Lack of relevant experience, lack of relevant qualifications, unsuitable job location, equity considerations, poor remuneration, new or emerging job not defined before

Specialisation/Occupation	OFO Code	Reasons for difficulties in recruitment
Section Engineer / Engineering Manager	2021-132104	Lack of relevant experience, lack of relevant qualifications, equity considerations, poor remuneration, slow recruitment processes
Mining Manager / Mine Manager / General Manager Mining / Production Manager	2021-132201	Lack of relevant experience, unsuitable job location, slow recruitment processes, lack of relevant qualifications, equity considerations
Shift Supervisor (Mining) / Mine Overseer (Production)	2021-312101	Lack of relevant experience, lack of relevant qualifications, poor remuneration, equity considerations, unsuitable job location, slow recruitment processes
Maintenance Planner	2021-312202	Poor remuneration, lack of relevant qualifications, lack of relevant experience, unsuitable job location
Miner	2021-312102	Lack of relevant experience, unsuitable job location, equity

Specialisation/Occupation	OFO Code	Reasons for difficulties in recruitment
		considerations, lack of relevant qualifications
Human Resource Manager / Employee Relations Manager	2021-121201	Unsuitable job location, lack of relevant experience, equity considerations, lack of relevant qualifications
Occupational Hygienist / Safety, Health, Environment and Quality (SHE&Q) Practitioner	2021-226302	Lack of relevant experience, unsuitable job location, lack of relevant qualifications, equity considerations
Reliability Engineer	2021-132107	Lack of relevant experience, poor remuneration, unsuitable job location, slow recruitment processes
Training Officer / Training Coordinator	2021-242401	Unsuitable job location, lack of relevant qualifications, lack of relevant experience, slow recruitment processes
Cost Accountant	2021-241102	Lack of relevant experience, equity considerations
Mechanical Foreman / General Engineering Supervisor (GES)	2021-312103	Lack of relevant experience, lack of

Specialisation/Occupation	OFO Code	Reasons for difficulties in recruitment
		relevant qualifications, equity considerations, unsuitable job location
Supply Chain Executive / Supply Chain Manager	2021-132401	Equity considerations, lack of relevant experience, lack of relevant qualifications, unsuitable job location*
Plant Engineer / Automation and Control Engineer	2021-214101	Lack of relevant experience, equity considerations, lack of relevant qualifications, unsuitable job location, slow recruitment processes
Quality Inspector	2021-684305	Lack of relevant experience, lack of relevant qualifications
Mine Safety Officer / Housing Inspector	2021-325705	Unsuitable job location, lack of relevant experience, lack of relevant qualifications, equity considerations

(Note: For Supply Chain roles, 'Unsuitable job location' was only cited for the Manager, not the Executive, but is included here as a potential reason for the occupational group).

Several factors have been identified as contributing to the challenges in recruitment within the mining sector. These include a lack of relevant experience, insufficient qualifications,

unsuitable job location, equity considerations, poor remuneration, and slow recruitment processes. Figure 52 maps these challenges, with the lack of relevant experience emerging as the most frequently cited primary barrier, followed closely by the lack of relevant qualifications and unsuitable job location. The percentages shown reflect the primary reason for recruitment difficulty as reported by employers.

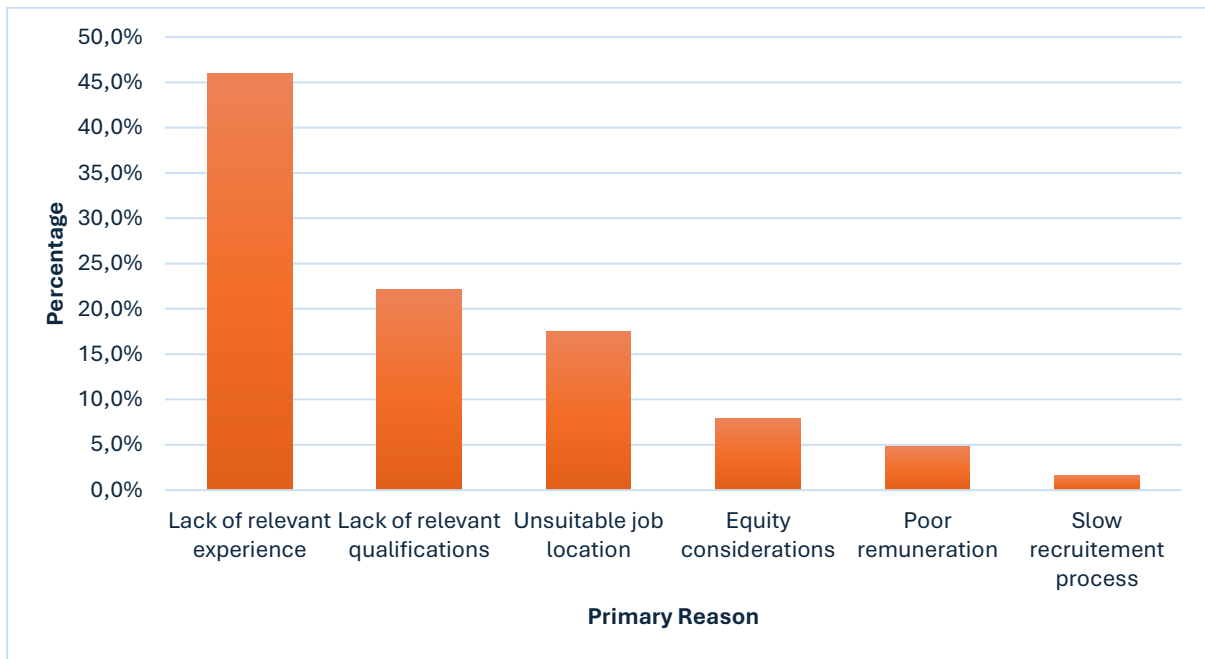


Figure 52: Primary reasons for hard-to-fill vacancies in the Northern Cape MMS

4.3.2. Top-up skills

Table 12 presents the occupations in which skills gaps have been identified by mining companies in the province. The highlighted occupations were reported by at least two companies, indicating recurring skills development needs across the sector. Leadership and supervisory skills emerge as the most prominent gaps, particularly for management and supervisory roles. In addition, occupational health and safety skills remain a critical requirement across technical, operational, and support occupations. Skills related to planning and organising, interpersonal communication, and problem-solving also feature consistently, reflecting the increasing complexity of operational coordination, workforce management, and compliance requirements within the mining sector. The highlighted occupations in Table 10 represent roles most frequently reported by mining companies and associated with multiple top-up skill requirements.

Table 12: Top-up Skills Required for the MMS in Northern Cape

Specialisation/Occupation	OFO Code	Generic Skillset
Production Manager	2021-132201	Leadership, interpersonal skills, legal governance and risk
Mine Manager / General Manager Mining / Plant Manager	2021-132201	Leadership
Technical Services Manager (Mining)	2021-132202	Leadership
Mining Operations Supervisor / Mining Production Supervisor / Shift Supervisor (Mining)	2021-312101	Supervisory skills, leadership, planning and organising, problem-solving, computer literacy, production management
Engineering Manager	2021-132104	Interpersonal skills, legal governance and risk, technical (job-specific)
Human Resource Officer / Administrator	2021-242303	Planning and organising, communication, management, problem-solving
Training Officer / Training and Development Practitioner	2021-242401	Technical (job-specific), problem-solving, computer literacy, legal governance and risk, interpersonal skills
Safety, Health, Environment and Quality (SHE&Q) Practitioner	2021-226302	Occupational health and safety skills, interpersonal skills
Business Services Manager	2021-121902	Customer service skills, production management, computer literacy, interpersonal skills

Maintenance Planner	2021-312202	Interpersonal skills, technical (job-specific)
Diamond Sorter / Diamond Handler / Diamond Sorter and Evaluator	2021-661304	Problem-solving, planning and organising, interpersonal skills, occupational health and safety skills
Millwright	2021-671202	Technical (job-specific), interpersonal skills
Security Guard	2021-541401	Interpersonal skills, problem-solving, first aid, legal governance and risk, leadership
Boilermaker	2021-651302	Technical (job-specific)
Diesel Mechanic	2021-653306	Technical (job-specific)
Auto Electrician	2021-671208	Technical (job-specific)
Trade Union Representative	2021-111402	Leadership, customer service skills, problem-solving

4.3.3. Community skills development and training programmes

The WSP-ATR community training statistics for the Northern Cape in the 2024 financial year indicate a high level of implementation that substantially exceeded original targets in both scope and scale. A total of 6,135 beneficiaries were reached through implemented training interventions, more than double the 2,572 beneficiaries initially planned. This outcome was supported by a marked increase in implementation activity, with 357 training line items delivered against 225 planned, reflecting a strong expansion in training delivery during the reporting period.

The largest beneficiary reach was achieved through bursaries and academic support programmes, driven primarily by large-scale school-level interventions alongside a broad range of tertiary and vocational bursaries across technical, professional and social disciplines. Job-specific development programmes also contributed significantly to overall delivery, particularly through apprenticeship training, portable skills development and targeted youth programmes aimed at enhancing employability within mining and related sectors.

Short courses and portable skills programmes played a central role in expanding beneficiary numbers, reflecting an emphasis on rapid skills acquisition and immediate employability. These interventions were complemented by Adult Education and Training (AET) programmes, where literacy and numeracy initiatives demonstrated strong uptake and completion rates, particularly at Pre-AET and AET Level 4.

The dataset further reflects sustained investment in technical and trade training, including programmes for diesel mechanics, electricians, fitters and turners, as well as professional development through internships and work placements in disciplines such as mining engineering, geology, environmental health and safety. Safety-related training featured prominently across multiple intervention types.

While most programme categories exceeded planned beneficiary targets, more structured interventions such as learnerships recorded lower delivery relative to planned figures. However, this shortfall was offset by expanded delivery through short courses and job-specific development programmes, indicating a substitution effect rather than an overall reduction in training effort.

Overall, the Northern Cape training data reflects a delivery model characterised by flexibility and scale, with mining companies prioritising interventions that maximise community reach, particularly among unemployed youth. The strong reliance on portable skills and job-specific programmes suggests a strategic focus on broad-based skills development to enhance local economic participation, while formal qualifications continue to play a complementary role in longer-term human capital development.

Table 13: Summary of planned and implemented training programmes

Programme Planned	Training Planned (Line Items)	Training Done (Line Items)	No. of Beneficiaries (Planned)	No. of Beneficiaries (Trained)
Adult Education and Training	16	12	101	185
Bursary	32	128	262	1,826
Certificate	7	8	56	21
Internship	18	27	38	70
Learnership	34	24	196	105
MQA Qualification	6	3	99	52
National Diploma / Degree	48	32	81	78
Short Course	12	56	175	813
Skills Programme	8	3	52	24
Trade	15	18	40	102
Work Placement	8	25	32	75
Job Specific Development	21	21	1,440	2,784
TOTAL	225	357	2,572	6,135

The data reveals a strong focus on engineering and mining-related education through bursaries, with substantial investment in tertiary education for youth pursuing careers in mining engineering, electrical engineering, mechanical engineering and related fields. Short courses in construction and business skills also feature prominently, supporting the development of immediate employability skills within surrounding communities.

While the data reflects substantial delivery of community programmes, it also highlights areas where planned training exceeded implementation, particularly within formal qualification pathways, alongside other areas where delivery significantly exceeded initial plans, notably in job-specific and trade-related skills. This pattern indicates a flexible implementation approach, while also pointing to opportunities for improved alignment between planning and delivery processes.

4.3.4. Key insights from interviews with mining companies, training providers and engineering firms

The following insights were drawn from key informant interviews with representatives from mining companies, training providers, and engineering firms operating in the province:

- A central theme emerging from the interviews is the presence of a persistent barrier to entry into mining-related occupations, particularly for unemployed youth. Participants described an “experience gap”, where candidates are unable to secure employment without prior workplace exposure, yet cannot obtain such experience without first being employed. This constrains progression from school leaver to semi-skilled artisan and reflects broader systemic challenges in linking training provision with work-integrated learning pathways.
- Key informants highlighted a severe shortage of local artisan training infrastructure within the province. The absence of accredited facilities and trade test centres requires companies to send learners and employees to other regions for training and assessment, significantly increasing costs related to travel, accommodation, and downtime, and limiting the scale at which training can be implemented. This finding aligns with provincial and national policy concerns regarding uneven access to accredited technical training in geographically extensive provinces.
- Interviewees noted that even where theoretical training is available, access to practical training environments remains limited, particularly for unemployed individuals. Without exposure to operational sites or heavy machinery, many learners are unable to complete the practical components required for certification,

reinforcing the importance of structured workplace-based learning models supported through industry collaboration.

- There is a strong demand for accredited short courses that can act as stepping stones into artisanal roles. Participants specifically identified short-duration programmes in areas such as welding, spray painting, and basic mechanical work as critical for enabling progression from general labour to semi-skilled employment. The need for modular and flexible training pathways is consistent with policy emphasis on improving access to occupational skills for unemployed and under-skilled populations.
- Key informants emphasised that skills needs are evolving in response to automation and digitalisation within the mining sector. Roles involving Trackless Mobile Machinery, auto-electrical work, and draughting are increasingly affected by remote-controlled and automated systems. As a result, digital literacy and computer-based skills are now regarded as essential prerequisites for advancement into supervisory and technical positions, mirroring broader industry trends identified in skills planning frameworks.
- Ongoing scarcity of specialised professional skills was also highlighted, particularly in geology, mining engineering, and electrical engineering. The lack of regionally available academic programmes limits the local supply of graduates, contributing to continued reliance on skills imported from outside the province. This reflects wider concerns around the alignment of higher education provision with sector-specific skills demand.
- While mining companies generally indicated a commitment to local recruitment and procurement, Participants acknowledged challenges related to workforce retention. Skilled artisans frequently migrate to larger mining hubs offering higher remuneration, resulting in a continual loss of experienced personnel from the province and undermining long-term skills stability.
- The Mining Qualifications Authority (MQA) was consistently described as a credible and trusted stakeholder in skills development. Participants called for a stronger regulatory and oversight role to address non-compliant training providers, as well as an expanded regional presence to better support community-based training initiatives and alignment with local development priorities, consistent with policy expectations regarding SETA coordination and quality assurance.

4.4. Synthesis of findings and priority skills areas

The community surveys and key informant interviews revealed key insights that are shaping skills development and local economic participation in the Northern Cape. These are highlighted below.

- The provincial sample is youth dominated but formal education attainment is low with only 36% holding matric and only 10% have post-school qualifications. Foundational gaps are most acute in Namakwa and Pixley ka Seme. School subject choices are skewed toward humanities and life sciences where Mathematical Literacy exceeds Mathematics, limiting access to STEM and engineering pathways. Learners cite difficulty with mathematics, weak pedagogy, insufficient support, and limited career guidance as primary deterrents.
- Unemployment is high with full-time employment modest and self-employment small. Employment concentrates in general government services and mining while and while social grants are the largest income source signalling vulnerability and limited private-sector absorption beyond mining. Pixley ka Seme and Namakwa show the toughest labour-market conditions.
- Across districts, agriculture, construction, and renewable energy emerged as top opportunity sectors (with Mining a core employer among the participants). This alignment appears in ZF Mgcawu, Frances Baard, Namakwa, John Taolo Gaetsewe, and Pixley ka Seme, where the three sectors have been identified to offer opportunities.
- Communities have identified mining engineering, electrical engineering, boiler making, OHS and mechanical engineering (9%) as key skills needed to support for meaningful participation in the MMS in the province.
- Youth recorded technical skills as their top need, followed by leadership, soft skills and Entrepreneurship. District emphases differ with John Taolo Gaetsewe leaning most to technical training, Namakwa to leadership, Pixley ka Seme to soft skills, and ZF Mgcawu to entrepreneurship.
- Familiarity with Fourth Industrial Revolution (4IR) technologies and mining automation is comparatively low among community members, indicating limited

readiness for digitally driven changes in the mining sector. In contrast, awareness of renewable energy is significantly higher, suggesting greater exposure to or engagement with energy-transition initiatives.

- The key skills needed to leverage opportunities in renewable energy projects are solar installation, maintenance, battery systems, and supporting health and safety and project coordination skills.
- In addition, the following skills were identified as being crucial to widen participation in different economic sectors in the province - health and safety, project management and digital skills, as well as leadership and supervision, equipment maintenance and financial management.
- A majority perceive small-business opportunities, clustering in retail, services agriculture as the sectors offering most opportunities. Several challenges were noted as affecting small businesses in the province and these include lack of capital, business skills, market access, limited mentorship, and regulatory hurdles. Communities identified business skills, financial management, and marketing as the most needed by entrepreneurs
- When asked where initiatives should concentrate, participants highlighted the need to direct focus towards preparing youth for mining careers, upskilling current mining workers, and supporting local businesses that serve mining.
- In terms of training, only a small percentage was aware of mining related programmes. Access to training is perceived as difficult/very difficult, with lack of information, age restriction, and distance to training facilities identified as main barriers.
- Most community members were not familiar with the MQA and so they call for better communication about training opportunities, more programme variety, stronger job-market alignment, and an easier application process.
- Across both participant groups, there is clear agreement that the province faces a systemic mismatch between local skills supply and industry demand. Limited access to accredited training institutions, artisan development facilities, and trade test centres constrains the ability of residents to enter or progress within mining and related sectors. This results in continued reliance on skills sourced from outside the province, while local unemployment remains high. These findings align with concerns

raised in national and provincial skills planning frameworks, including the National Skills Development Strategy (NSDS III), which emphasises the need to expand access to occupationally directed training in under-serviced regions.

- Both community representatives and key informants highlighted the existence of a skills pipeline bottleneck, particularly for unemployed youth. While demand exists for semi-skilled and artisanal roles, pathways from school completion to workplace readiness remain fragmented. The lack of practical training exposure, combined with experience requirements imposed by industry, creates a cycle that excludes first-time entrants to the labour market. This challenge reflects broader policy concerns articulated in the White Paper for Post-School Education and Training, which identifies weak school-to-work transitions and limited work-integrated learning opportunities as persistent structural constraints.
- There is strong convergence around the need to adapt skills development to changing industry dynamics. Mining remains central to the provincial economy, but automation, digitalisation, and the parallel growth of renewable energy infrastructure are reshaping occupational requirements. Both groups noted that technical, electrical, and digitally enabled skills are increasingly essential, yet current training offerings have not fully aligned with these shifts. This mirrors national policy emphasis on preparing the workforce for technological change and the green economy, including priorities outlined in sectoral skills plans and energy transition frameworks.
- Participants from both perspectives underscored that economic participation extends beyond employment, particularly through local procurement and enterprise development. However, community-based SMMEs face persistent barriers related to access to capital, equipment, and technical capacity, limiting their ability to scale into higher-value segments of mining and infrastructure supply chains. These challenges echo policy objectives within the Mineral and Petroleum Resources Development Act (MPRDA) and Social and Labour Plan (SLP) framework, which emphasise local economic development and supplier development in mining-affected communities.
- Social and economic vulnerability emerged as a cross-cutting constraint. Field workers emphasised the role of poverty, youth disengagement, and limited access to post-

school education, while key informants pointed to affordability constraints and insufficient funding mechanisms for community-based training. Together, these factors reduce the accessibility and effectiveness of skills development initiatives for those most in need, reinforcing concerns raised in provincial socioeconomic and labour market analyses.

- Finally, both data sources converge on the importance of long-term, coordinated planning. Strengthening early skills pipelines, improving collaboration between industry, training providers, and schools, and ensuring oversight and accountability within the training ecosystem were consistently identified as critical to building a more inclusive, resilient, and future-oriented provincial workforce. This aligns with the intended coordinating role of SETAs, including the MQA, as articulated in national skills governance and quality assurance frameworks.

4.5. Conclusion

This chapter presented an integrated overview of the skills development context in the Northern Cape, drawing on community-level insights, key informant interviews, and analysis of WSP-ATR documentation. This chapter presented an integrated overview of the skills development context in the Northern Cape, drawing on community-level insights, key informant interviews, and analysis of WSP-ATR documentation. The findings highlighted key socioeconomic characteristics of mining-affected communities, alongside priority skills needs linked to mining operations and emerging sectors such as renewable energy.

The analysis identified persistent skills gaps, including hard-to-fill vacancies, limited access to accredited training and trade test facilities, and barriers to work-integrated learning for unemployed youth, while also highlighting the role of mining companies in supporting community-based training initiatives. Insights from stakeholders further illustrated challenges related to skills alignment, workforce readiness, and enterprise participation, providing a comprehensive understanding of the current skills development landscape in the province. Collectively, these findings provide an evidence-based foundation for the recommendations presented in the subsequent chapter.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

This study was initiated to gain insights into MMS-related skills development needs in the Northern Cape province, in response to persistent unemployment, poverty, and limited economic participation within mining-affected communities. The Northern Cape hosts several large-scale mining operations and plays a strategic role in the national mining economy, while also experiencing spatial dispersion, limited access to training infrastructure, and high youth unemployment. The study sought to identify priority skills gaps and development needs that must be addressed to enhance the employability of community members and strengthen their ability to leverage economic opportunities within the MMS and related sectors of the provincial economy.

The study was conducted using a mixed-methods approach comprising document analysis, community surveys, community engagements, and key informant interviews. Through the application of these methods, insights were obtained into the socioeconomic context of mining-affected communities, current skills development challenges, and stakeholder perspectives on the effectiveness of existing training interventions and workforce development initiatives.

The key findings of the study revealed a mismatch between the province's skills supply and the demands of its major economic sectors, especially mining, construction, agriculture, and renewable energy. Communities emphasise the importance of mining-related technical skills, while young people prioritise technical training, leadership development, soft skills, and entrepreneurship. The interviews highlighted that limited access to accredited training institutions, artisan development facilities, and trade test centres continues to constrain skills development, forcing reliance on labour imported from outside the province instead of building local capacity. This misalignment is recognised in national policy frameworks such as NSDS III and underscores the need to expand access to occupationally directed programmes.

Across both datasets, a major bottleneck is the fragmented skills pipeline, particularly affecting unemployed youth. While there is demand for semi-skilled and artisanal roles,

pathways between school completion and workplace readiness remain weak, a challenge worsened by limited opportunities for practical training. These insights mirror concerns raised in the White Paper for Post-School Education and Training, which identifies poor school-to-work transitions and restricted work-integrated learning (WIL) access as ongoing structural barriers. On the survey side, this is compounded by low awareness of available training programmes, high perceived difficulty in accessing them, and significant educational gaps, especially in districts where large proportions of adults do not hold matric or have weak STEM foundations.

Both the survey results and interviews highlight the need for skills development systems to adapt to technological changes reshaping the mining and energy landscapes. Community familiarity with 4IR and mining automation is low, even though these technologies are increasingly central to modern mining operations. In contrast, survey participants show relatively high awareness of renewable energy opportunities, identifying solar installation, maintenance, and battery storage systems as key skills required for emerging opportunities. Interviewees reinforce this trend, noting that technical, electrical, and digitally enabled skills are becoming essential, but that training offerings have not yet aligned with these evolving occupational requirements. This reflects broader national imperatives to prepare the workforce for digitisation, automation, and the green economy.

Another recurring theme across both evidence sources is that economic participation extends beyond employment, with meaningful opportunities stemming from local procurement, enterprise development, and integration of SMMEs into mining and infrastructure value chains. However, community-based small businesses face systemic barriers relating to access to capital, equipment, technical capability, and mentorship. Surveys reveal that lack of funding, limited business skills, and market access are among the top inhibitors of entrepreneurship. Interviews similarly show that SMMEs struggle to move beyond low-value activities due to capability gaps, despite policy frameworks (e.g., MPRDA, SLPs) emphasising supplier development in mining-affected communities. This signals a need for a more coordinated approach to enterprise-linked skills development that connects training to real procurement and contract opportunities.

The findings also underscore social and economic vulnerabilities shaping education and training participation. Financial constraints, poverty, limited access to institutions, poor maths and science preparation, and a lack of career guidance restrict learning progression and influence subject choices. Interviewees further emphasise that affordability and insufficient community-based training funding disrupt access for those most in need. These pressures reduce the reach and effectiveness of training initiatives and contribute to youth disengagement. Addressing these barriers requires a dual strategy that strengthens foundational schooling while removing access obstacles in the post-school ecosystem.

Finally, both the surveys and interviews stress the importance of long-term, coordinated planning and collaboration among industry, training providers, SETAs (including the MQA), schools, and municipalities. Interview respondents point to the need for stronger system oversight, shared accountability, and integration of skills planning into district development structures. Survey feedback further reinforces that low awareness and limited participation in MQA programmes stem from communication gaps, insufficient programme variety, and weak alignment to community needs. Together, these findings indicate that skills development efforts must be integrated, responsive, and better coordinated to achieve a more inclusive and future-oriented skills pipeline.

5.2. Priority areas for skills development and training in the province

Against these findings, the following have been identified as priority areas for skills development and training in the Northern Cape.

- Strengthening foundational education and STEM readiness – there is a need to address high rates of non-matriculation, weak maths/science performance, and limited STEM subject uptake to open pathways into engineering, artisanal, and digital careers.
- Expanding technical, artisanal, and engineering training capacity – there is a need to increase access to accredited training, artisan development, WIL pathways, and trade testing especially aligned to mining, energy, construction, and agri-processing.
- Aligning training programmes to technological change – there is a need to develop training for automation, digitalisation, and 4IR-related capabilities while expanding

renewable-energy skill sets such as solar installation, battery systems, and energy safety.

- Improving access, awareness, and navigability of training programmes – there is a need to address the province’s low awareness levels, high access barriers to ensure inclusive participation in training programmes.
- Supporting enterprise and supplier development capabilities - strengthening business skills, financial management, and technical capacity within SMMEs to enable participation in mining and infrastructure supply chains.
- Strengthening system coordination and accountability – there is a need to enhance collaboration across SETAs, TVETs, industry, and municipalities; integrate skills planning into local development frameworks; and improve programme monitoring

5.3. Recommendations

Recommendations

The following recommendations are based on the key findings of the study are as follows:

Recommendation 1: Increase visibility and communication in the province

The MQA should significantly strengthen its visibility and communication in the Northern Cape, as most communities are unfamiliar with its role or programmes. This requires district-level outreach, multilingual communication campaigns, and easy-to-access information channels such as WhatsApp, SMS, and community radio. Improving visibility is essential to close the awareness gap and ensure communities understand what training opportunities exist and how to access them.

Recommendation 2: Expand accredited training

The study identified a significant constraint in the Northern Cape relating to the limited availability of accredited artisan training providers and trade test centres, particularly in high-demand occupations such as diesel mechanics, plant fitting, welding, and electrical trades. Both field workers and key informants indicated that this gap restricts local skills development, delays certification, and increases training costs for employers, who are often required to send learners to other provinces for training and assessment. The absence of local accreditation capacity further limits opportunities for unemployed community members to access artisanal career pathways and contributes to the persistence of hard-to-fill vacancies

within the province. In response to these challenges, it is recommended that the MQA initiate targeted interventions to expand accredited artisan training provision within the Northern Cape. This should include capacity-building support for potential training service providers to meet accreditation requirements, as well as engagement with relevant stakeholders to explore the establishment of local trade test centres.

Recommendation 3: Strengthening work-integrated learning (WIL) pathways

The study findings indicate that a key barrier to employment for unemployed youth and entry-level workers in the Northern Cape is the lack of practical workplace experience required to access mining and related sector jobs. Both field workers and key informants highlighted a persistent “experience gap”, where individuals complete theoretical training but are unable to secure employment or certification due to limited access to operational sites, machinery, or supervised practical exposure. This challenge is particularly acute for community members seeking progression from general labour into semi-skilled and artisanal roles. It is recommended that the MQA support the expansion of work-integrated learning (WIL), apprenticeships, and short accredited courses that provide practical exposure aligned to industry requirements

Recommendation 4: Need to align training programmes with emerging technologies

The study findings indicate that skills demand within the Northern Cape is shifting because of increased automation, digitalisation, and the expansion of renewable energy infrastructure. Key informants highlighted that several traditional mining roles are being transformed through the introduction of automated and remote-controlled systems, while community members noted growing demand for electrical, technical maintenance, and digitally enabled skills linked to solar and wind energy projects. Despite these shifts, current training provision has not fully adapted to reflect emerging occupational requirements, limiting workforce readiness and progression opportunities. It is recommended that the MQA strengthen the alignment between skills development initiatives and evolving industry needs by prioritising training that integrates digital literacy, computer-based competencies, and technical skills relevant to both mining and renewable energy sectors.

Recommendation 5: Strengthen the skills pipeline from schooling into post-school training

To strengthen the skills pipeline from schooling into post-school training, the MQA should promote STEM readiness and career guidance. Partnerships with schools, targeted maths and science bridging programmes, and tailored bursaries for high-demand fields such as mining engineering and electrical engineering would enhance progression pathways for youth, particularly those in districts with low matric and STEM uptake.

Recommendation 6: Support enterprise development in the province

Recognising the role of enterprise development in economic participation, the MQA should support mining-aligned SMMEs through enterprise-readiness training, financial-management support, and linkages to procurement opportunities in Social and Labour Plans. Training alone is insufficient; entrepreneurs also need capacity and access to markets to build viable businesses around mining supply chains.

Recommendation 7: Implementation of targeted occupational health and safety training in mining operations in the Northern Cape

The study findings indicate that occupational health and safety (OHS) skills gaps remain a critical concern within mining operations in the Northern Cape. Both field workers and key informants identified OHS as one of the most prominent cross-cutting skills gaps affecting a wide range of occupations, from general workers to supervisory roles. Inadequate OHS training poses risks to worker safety, operational efficiency, and regulatory compliance, particularly in a sector characterised by hazardous working environments. It is recommended that the MQA support the implementation of targeted OHS training programmes in collaboration with mining companies and accredited service providers. These programmes should focus on practical risk management, compliance with safety standards, and the development of a strong safety culture across mining operations.

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