

Mining **Future Skills**



**CONDUCTING RESEARCH STUDIES ON SKILLS DEVELOPMENT AND RELATED
MATTERS WITHIN THE SUBSECTORS OF THE MINING AND MINERALS SECTOR
(MMS): A CASE STUDY OF LIMPOPO PROVINCE**

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MINING QUALIFICATIONS AUTHORITY

Final Report

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LIST OF ABBREVIATIONS AND ACRONYMS

Table 1: Abbreviations and Acronyms

Abbreviation	Full Meaning
AET	Adult Education and Training
AgriSETA	Agriculture Sector Education and Training Authority
AMC	AMC Training Centre
APP	Annual Performance Plan
ARPL	Artisan Recognition of Prior Learning
CATHSSETA	Culture, Arts, Tourism, Hospitality and Sport Sector Education and Training Authority
CBO	Community-Based Organisation
CEIC	CEIC Data (Economic Database)
CHIETA	Chemical Industries Sector Education and Training Authority
CLAS	Cement, Lime, Aggregates and Sand
DBE	Department of Basic Education
DDM	District Development Model
DEET	Disability Economic Empowerment Trust
DHET	Department of Higher Education and Training
DMPR	Department of Minerals and Petroleum Resources
DMRE	Department of Mineral Resources and Energy
DPME	Department of Planning, Monitoring and Evaluation
EE	Electrical Engineering
EnSci	Engineering Sciences
EPWP	Expanded Public Works Programme
ERRP	Economic Reconstruction and Recovery Plan
EU	European Union
EWSETA	Energy and Water Sector Education and Training Authority
FASSET	Finance and Accounting Services Sector Education and Training Authority
FLC	Foundational Learning Competence
GDP	Gross Domestic Product
HR	Human Resources
HRDCSA	Human Resource Development Council of South Africa
HRDSSA	Human Resource Development Strategy for South Africa
HDSA	Historically Disadvantaged South Africans
HTFV	Hard-To-Fill Vacancies
ICT	Information and Communication Technology
ILO	International Labour Organisation
IPAP	Industrial Policy Action Plan
IT	Information Technology
JET	Just Energy Transition
LAP	Labour Activation Programme
LEDA	Limpopo Economic Development Agency
LGSETA	Local Government Sector Education and Training Authority
M&E	Monitoring and Evaluation
MCSA	Minerals Council South Africa
merSETA	Manufacturing, Engineering and Related Services Sector Education and Training Authority
MMS	Mining and Minerals Sector
MQA	Mining Qualifications Authority
MR	Mineral Resources
MRM	Mineral Resource Management
MTSF	Medium-Term Strategic Framework
NDP	National Development Plan
NEET	Not in Education, Employment or Training

Abbreviation	Full Meaning
NGO	Non-Governmental Organisation
NPO	Non-Profit Organisation
NPPSET	National Plan for Post-School Education and Training
NSDP	National Skills Development Plan
NSF	National Skills Fund
OECD	Organisation for Economic Co-operation and Development
OFO	Organising Framework for Occupations
OHS	Occupational Health and Safety
PGM	Platinum Group Metals
PSETA	Public Service Sector Education and Training Authority
PYEI	Presidential Youth Employment Initiative
SBU	Strategic Business Unit
SDA	Skills Development Act
SDF	Skills Development Facilitator
SETA	Sector Education and Training Authority
SHEQ	Safety, Health, Environment and Quality
SSP	Sector Skills Plan
Stats SA	Statistics South Africa
TIPS	Trade and Industrial Policy Strategies
TVET	Technical and Vocational Education and Training
UIF	Unemployment Insurance Fund
UNESCO	United Nations Educational, Scientific and Cultural Organization
WIL	Work Integrated Learning
WISE	World Information Service on Energy
WPPSET	White Paper for Post-School Education and Training

**The Department of Mineral Resources and Energy (DMRE) has since been restructured and renamed the Department of Minerals and Petroleum Resources (DMPR) to better reflect its expanded mandate, which now includes the oversight and regulation of both mineral and petroleum sectors. For consistency and accuracy, references within the literature review are retained as per the author and departmental name cited in the original source documents.*

Confidentiality Statement – Draft Report

This report has been prepared on behalf of the Mining Qualifications Authority (MQA) in terms of the Memorandum of Agreement entered into between the MQA and its appointed Research Partner(s). The contents of this report, including all findings, data, analyses, interpretations, conclusions, and recommendations, constitute confidential information and remain the intellectual property of the MQA.

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All primary and secondary data collected and utilised in this study were processed in compliance with the Protection of Personal Information Act, 4 of 2013 (POPIA). Personal, institutional, and stakeholder information has been anonymised and aggregated to prevent the identification of individual respondents.

This report is intended solely for use by the MQA, its governance structures, and authorised stakeholders for the purposes of skills development planning, policy formulation, research, and strategic decision-making within the mining and minerals sector. Any unauthorised use, disclosure, or reliance on the contents of this report is strictly prohibited.

EXECUTIVE SUMMARY

This study was commissioned to provide a comprehensive assessment of the skills landscape within the Mining and Minerals Sector (MMS) in the Limpopo Province and to generate robust evidence that can inform strategic planning and decision-making within the mandate of the Mining Qualifications Authority (MQA). The purpose of the study was to examine current and emerging skills demand, evaluate the alignment between training supply and labour-market requirements, identify systemic constraints hindering workforce development, and propose actionable recommendations that strengthen skills planning, programme design, funding efficiencies and collaborative partnerships. The study places strong emphasis on Limpopo's unique socio-economic conditions, marked by high unemployment, spatial inequality and pronounced rurality, while recognising the province's continued reliance on mining and its growing significance in South Africa's Just Energy Transition (JET), renewable-energy expansion and regional economic diversification.

A mixed-methods research design was applied. Secondary data analysis drew on Workplace Skills Plans (WSPs), Sector Skills Plans (SSPs), national and provincial policy frameworks (including NSDP, DDM and JET policies), and academic literature on skills, labour markets and human capital. This was complemented by extensive primary qualitative data collection through stakeholder surveys, interviews and engagements with MMS employers, training providers, education institutions, SETAs, government departments and ward councillors. While the study intended to undertake deep district-level analysis consistent with the District Development Model's (DDM) place-based approach, uneven stakeholder participation and inconsistent provincial disaggregation in WSP submissions limited the reliability of district-specific insights. Nevertheless, district patterns were identified where evidence permitted, particularly in Waterberg, Sekhukhune, Mopani and Vhembe, where mining and energy activities are geographically concentrated.

Findings indicate that Limpopo has a diverse but unevenly distributed skills provision landscape. The province hosts two public universities, seven TVET colleges, a regional UNISA centre, numerous private colleges and several MQA-accredited training centres. However, access to high-quality training infrastructure, practical workshops, artisan development and accredited trade testing is heavily centralised in urban nodes such as Polokwane, Thohoyandou, Tzaneen and Phalaborwa. Mining-dependent and rural districts, particularly in Waterberg, Sekhukhune and parts of Mopani, face significant barriers to accessing training, workplace learning, digital connectivity and career progression. As a result, the supply of training does not consistently translate into improved employment outcomes, especially for unemployed youth and mining-affected communities.

Labour-market intelligence from WSPs reveals persistent and severe shortages in artisanal trades (electricians, fitters, millwrights, diesel mechanics), engineering professionals (mechanical, electrical, mining and instrumentation engineers), mining production roles (mine overseers, mining supervisors, rock engineers) and machine-operator occupations (TMM operators, drill rig operators). Demand for cross-cutting skills, including digital literacy, data

systems, safety and environmental compliance, has also intensified as mining houses adopt mechanised and automated processes and as green-economy activities increase in the Waterberg region. Provincial diversification priorities further highlight an emerging demand for transferable skills relevant to agriculture, agricultural processing, construction, logistics and renewable-energy installation and maintenance.

Despite substantial investment in training by MQA, SETAs, the National Skills Fund (NSF), companies and the state, the study found that skills development in Limpopo remains largely supply-driven and compliance-oriented. Programmes do not always reflect district economic realities, and many remain insufficiently aligned to employer needs or emerging provincial transition priorities. A critical systemic gap exists between theoretical training and recognised trade certification, particularly for learners completing N1–N6 programmes who are unable to secure workplace exposure or trade testing opportunities. This leads to widespread underemployment among individuals who hold partial qualifications but lack the practical competencies required for occupational entry. These dynamics reinforce skills mismatch and weaken the return on human capital investment.

The study further concludes that systemic factors, rather than programme-specific issues, are at the core of Limpopo's skills challenge. Fragmented planning processes, weak coordination across SETAs and government departments, inconsistent participation in WSP submissions, and insufficient district-level skills intelligence collectively hinder the responsiveness of the skills system. Stakeholders identified limited equipment, outdated workshops, transport barriers, low employer participation in workplace learning, and insufficient funding for artisan development as major constraints. As a result, unemployment, skills shortages and unutilised training outputs coexist, with mining-affected and rural communities facing the most severe impacts.

From a systems perspective, these findings demonstrate that improving employment outcomes in Limpopo cannot rely on training provision alone. Skills development must operate within an integrated ecosystem where planning, funding, workplace learning and labour-market absorption are aligned across institutions, sectors and districts. Without this integration, skills accumulation risks failing to convert into viable employment pathways, thereby weakening the province's ability to reduce poverty, promote inclusive growth and support a JET.

Building on these insights, the study proposes several strategic recommendations to strengthen Limpopo's MMS skills development system. At a strategic level, the MQA should position itself as a provincial system steward responsible for convening cross-SETA collaboration, shaping district-responsive planning, strengthening labour-market intelligence and ensuring that WSP evidence informs demand-driven investment decisions. Provincial skills planning must integrate MMS priorities into economic and spatial development strategies, particularly through the DDM, while improving training access in rural districts through blended learning, mobile training units, and strategically located satellite sites.

Programme and funding improvements are necessary to strengthen end-to-end learning pathways, prioritise artisanal and technical skills pipelines, modernise training infrastructure, and ensure progression toward trade certification. Funding mechanisms should incentivise workplace-based learning, employer participation, and support for green skills, digital competencies and economic diversification pathways. Partnerships across mining companies, training institutions, SETAs, municipalities and local communities must be reinforced through structured agreements focused on workplace learning, equipment sharing, joint curriculum review and community outreach. Enhanced engagement is essential for improving awareness, participation and accountability across the skills ecosystem.

Collectively, these recommendations aim to reduce labour-market mismatch, strengthen the responsiveness of provincial skills systems, and support the translation of training into meaningful employment outcomes. By enhancing alignment across institutions, sectors and districts, Limpopo can build a more resilient, future-ready workforce capable of supporting mining operations, driving economic diversification and contributing to socio-economic development in line with national priorities.

1. INTRODUCTION AND STUDY CONTEXT

1.1. Background and Rationale

The Mining Qualifications Authority (MQA) commissioned this study to evaluate and analyse the skills development landscape within the mining and minerals sector (MMS) in the Limpopo Province. The study focused on assessing current and emerging skills demand and supply, as well as the alignment between education and training provision, labour-market needs, and provincial socio-economic development priorities.

The rationale for the study was to ensure that skills development interventions in the province were grounded in credible evidence and responsive to both sectoral requirements and broader development objectives. By examining relevant policy and legislative frameworks, sectoral and labour-market dynamics, demographic trends, institutional capacity, and stakeholder experiences, the study aimed to generate actionable insights to inform MQA planning, funding allocation, and partnership decisions. In doing so, it aimed to contribute to a more coherent, responsive, and inclusive provincial skills development system that supports sustainable economic growth, employment creation, and participation in the mining value chain.

1.1.1. Provincial MMS Context

The MMS has historically been a central pillar of Limpopo's provincial economy, underpinned by the province's extensive and diverse mineral endowment. Mining activity is concentrated in districts such as Sekhukhune, Waterberg and Capricorn, where platinum group metals, coal, diamonds and copper have shaped employment patterns, settlement development and local economic structures over several decades. (Minerals Council of South Africa, 2025a; Limpopo Provincial Government, 2023). The presence of the Bushveld Igneous Complex has positioned Limpopo as a strategic contributor to South Africa's mineral economy, with mining forming the economic backbone of many host communities.

In recent years, Limpopo's MMS has been increasingly influenced by structural and cyclical pressures, including volatile commodity markets, rising production costs, mechanisation and South Africa's transition towards lower-carbon energy systems. While the sector continues to contribute a substantial share of provincial gross domestic product (GDP), its employment intensity has declined, reflecting productivity-driven changes and evolving operational models rather than widespread sectoral contraction. (Statistics South Africa, 2025a; National Treasury, 2024). These shifts have altered labour demand, reducing reliance on traditional labour-intensive roles and increasing demand for technical, automation-related and environmental management skills.

At the same time, Limpopo's economy has begun to diversify, with growing activity in agriculture, agricultural processing, logistics, manufacturing and renewable-energy-related sectors, particularly in districts such as Waterberg and Capricorn. (Statistics South Africa, 2024; Limpopo Treasury, 2025). This evolving economic context underscores the need for responsive, district-specific and demand-led skills planning that supports the modernisation of the MMS while enabling workforce adaptability and alignment with emerging economic pathways linked to beneficiation, industrialisation and the green economy.

1.1.2. Skills Development Mandate of MQA

The MQA is established by the Skills Development Act (Act 97 of 1998, as amended) and the National Skills Development Plan (NSDP) to promote, coordinate, and support skills development across the MMS throughout South Africa. While this mandate is nationwide, its execution is carried out at the provincial level through specific planning, funding strategies, and partnerships tailored to local labour-market needs. In the Limpopo Province, the MQA's responsibility is to ensure that skills development initiatives are evidence-based, aligned with sector demands, and conducive to sustainable economic growth, job creation, and inclusive participation in the mining value chain.

At the provincial level, the MQA fulfils its responsibilities by gathering and applying labour-market intelligence, distributing skills development funds, and working with employers, educational and training institutions, organised labour, and government stakeholders. These efforts seek to address occupational shortages and skills gaps, improve education and training programs, encourage workforce transformation, and foster community and cross-sector skills development in mining-affected regions. Through this strategy, the MQA aims to build a more responsive and integrated provincial skills development system that meets both the operational needs of the MMS and broader socio-economic development goals.

1.1.3. Link to National Priorities

The Limpopo provincial study was explicitly aligned with South Africa's overarching development and skills policy framework, particularly the NSDP, the National Development Plan (NDP) 2030, and the District Development Model (DDM). Together, these frameworks emphasise demand-led, place-based skills development that responds to sectoral needs, labour-market realities and spatial inequalities. Within this context, the study prioritised the alignment of skills development interventions with Limpopo's economic structure, characterised by a strong reliance on mining, especially platinum group metals, coal, diamonds and copper, alongside expanding sectors such as agriculture, agricultural processing, logistics, manufacturing and emerging green-economy value chains. Ensuring this alignment is essential for supporting sector sustainability, driving economic diversification, and improving

employment outcomes in a province facing persistent unemployment and uneven regional development dynamics.

In line with the DDM, the study adopted a district-level lens to examine skills demand, supply and development priorities across Capricorn, Mopani, Sekhukhune, Vhembe and Waterberg District Municipalities, as well as Polokwane Local Municipality, which functions as the economic hub of the province. This approach recognised that economic activity, labour-market patterns and development challenges differ markedly across districts and therefore require differentiated skills responses. Sekhukhune District remains a core centre of mining activity, particularly in platinum, chrome and related value chains; Waterberg is shaped by coal mining, energy generation and growing renewable-energy investments; while Capricorn and Vhembe exhibit increasing concentration in public services, logistics, agriculture and tertiary-sector activities linked to diversification and provincial development goals.

By aligning national policy priorities with district-specific socio-economic realities, the study was informed by an integrated conceptual framework that emphasises the relationship between skills investment, labour-market alignment and coordinated systems functioning. This framework reflects the intent of the NSDP to improve the match between skills supply and demand, supports the NDP's objectives of reducing unemployment and spatial inequality, and is consistent with the DDM's focus on integrated planning across spheres of government, industry and training institutions. Applying this approach enabled the study to assess not only occupational skills gaps and shortages, but also the structural and institutional constraints affecting skills utilisation, productivity and employment outcomes within Limpopo's MMS.

Through this alignment, the study aimed to ensure that MQA-supported skills development initiatives are responsive to Limpopo's sectoral and spatial priorities, grounded in labour-market evidence, and positioned to contribute to district-level economic development, social inclusion and long-term provincial resilience.

1.2. Scope of Study

The scope of this study was limited to the MMS within the Limpopo province of South Africa. The research focused on assessing skills demand, skills supply, and skills gaps relevant to the sector, with particular emphasis on critical and scarce occupations, workforce composition, and emerging skills requirements.

The study examined the accessibility, relevance, and perceived effectiveness of skills development interventions, including education and training provision, learnerships, and other workforce development mechanisms aligned with the mandate of the MQA. It incorporated perspectives from key stakeholders across the skills ecosystem, including industry, education and training institutions, organised labour, community representatives, government entities, and skills development intermediaries.

The analysis considered the provincial socio-economic context, sectoral characteristics, and cross-sectoral linkages influencing workforce development, including agriculture, manufacturing, and selected emerging sectors. The study also explored issues related to workforce readiness, reskilling and upskilling needs, and the implications of economic diversification and the energy transition for skills planning.

The scope of this study was deliberately broad and inclusive, reflecting the diverse occupational structure of the MMS and the interconnectedness of mining, supporting value chains, and related sectors. No specific occupational areas were predefined at the start. Instead, the scope was guided by empirical data from the Workplace Skills Plan (WSP), stakeholder consultations, and sector analysis.

The study included all occupational categories listed in the WSP data, submitted by mining companies and stakeholders. This encompassed technical, artisanal, professional, supervisory, managerial, and support roles. Such a broad scope enabled a thorough evaluation of occupational shortages, difficult-to-fill vacancies, and skills gaps across the MMS without restricting the focus to a limited set of jobs. Moreover, the analysis extended beyond core mining roles to encompass transferable and cross-sector skills relevant to industries such as manufacturing, agriculture, energy, logistics, tourism, and services. It also considers entrepreneurial and business skills that promote local economic growth and workforce mobility.

The study encompassed the entire provincial region, analysing data at both provincial and district levels in accordance with the DDM. It also evaluated the capacity and functions of education and training institutions, industry-based trainers, and MQA-supported skills initiatives. Using a data-driven and inclusive approach to occupational coverage, the study offers comprehensive evidence to guide MQA's planning, funding, and strategic efforts within the province.

1.3. Problem Statement

Limpopo's MMS remains a central pillar of the provincial economy, consistently contributing more than 30% to provincial GDP and shaping economic activity across major mining districts such as Capricorn, Sekhukhune and Waterberg (Limpopo Treasury, 2025). Despite this substantial contribution, the sector has experienced periods of instability, illustrated by the 5.9% reduction recorded in 2016, which highlights underlying structural vulnerabilities and the need for a more adaptive and resilient skills base (National Treasury, 2018). Such variability directly affects employment stability and long-term development outcomes in communities dependent on mining.

Within this context, Limpopo's post-school education and training system plays an important role in supplying skills for mining-related occupations. The province hosts seven public Technical and Vocational Education and Training (TVET) colleges, namely Capricorn, Lephalale, Mopani, Letaba, Sekhukhune, Vhembe and Waterberg, which collectively offer programmes in engineering studies, artisan trades, and other technical fields relevant to the MMS (Department of Higher Education and Training (DHET), 2023a). However, research highlights that many TVET institutions nationally, including those in Limpopo, face challenges such as ageing engineering equipment, limited access to modern industry technologies, and insufficient integration of digital and automation tools. These factors weaken the alignment between vocational training and industry requirements (Lukhele & Laseinde, 2024). Although national and provincial structures, including the Human Resource Development Council (HRDC) and relevant Sector Education and Training Authorities (SETAs), have engaged in initiatives to strengthen artisan development, progress in tailoring training to district-specific labour-market needs remains inconsistent (Department of Higher Education and Training (DHET), 2021a; Human Resource Development Council (HRDC), 2022a).

At the policy level, frameworks such as the Limpopo Development Plan (2025–2030) emphasise the expansion of sector-specific skills development and the strengthening of TVET pathways to support industrialisation, mineral beneficiation, and employment creation (Limpopo Provincial Government, 2025b). Similarly, mandates issued to institutions like the Limpopo Economic Development Agency (LEDA) reinforce the province's commitment to developing skills pipelines that promote beneficiation, industrial transformation, and localised value-chain growth (Limpopo Economic Development Agency (LEDA), 2023b). However, the practical implementation of these policy directives remains limited by fragmented coordination among industry players, education institutions, SETAs, and government departments.

From a systems perspective, skills planning in Limpopo remains insufficiently integrated, resulting in mismatches between the supply of qualifications, the evolving occupational profile of the MMS, and the province's broader development priorities. This includes gaps in critical mining-related trades, uneven distribution of training infrastructure across districts, and limited responsiveness to emerging skills required by technological change and green-economy transitions.

Consequently, the core problem addressed by this study is that *although Limpopo's MMS continues to drive a significant share of the provincial economy, persistent shortages in sector-critical skills, unequal access to relevant training infrastructure, and weak provincial-level coordination undermine the development of a demand-led, future-ready skills ecosystem capable of supporting sustainable growth and workforce mobility.*

1.4. Study Objectives

The aim of this research project was to conduct a thorough assessment of the MMS skills landscape in the Limpopo province. The study sought to identify and analyse critical occupational shortages, skills gaps, and development priorities that align with the MQA mandate and broader national and provincial policy frameworks. This included considering the province's unique economic landscape, mineral resource endowments, sectoral priorities, socio-economic advancements, and its broader development goals. Specifically, the research aimed to generate evidence-based insights that would inform targeted skills development interventions, support inclusive local economic growth, enable workforce participation, and contribute to the effective alignment of education and training supply with current and emerging industry demands in the province.

The specific objectives identified for this study included:

- Analysing the effectiveness of current legislation, policies, and strategies driving skills development in the province.
- Assessing the alignment of provincial frameworks with national strategies (including DDMs).
- Analysing the population demographics of the province (including age distribution, gender, and racial representation, educational attainment levels and skillsets of working-age population).
- 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).
- Analysing the economic performance of the MMS compared to other sectors in the provincial economy.
- Assessing its contribution to GDP, job creation, and revenue generation.
- Identifying the existing mining-related occupational shortages (hard-to-fill vacancies) and skills gaps within the province and the reasons thereof
- Identify the mismatches between the skills required by mining companies and the skills available in the community.
- Assessing the adequacy and effectiveness of existing skills development programmes in addressing provincial needs.
- Analysing the capacity offerings of technical colleges, universities, and industry-specific training providers in addressing the skills development in the province.
- Identifying the common skills development needs of community members living near mining operations and beyond mining-specific jobs.
- Analysing the demand for skills in related sectors such as agriculture, manufacturing, tourism, and service industries.

- Assessing the need for entrepreneurial and business development skills for local economic empowerment.
- Gathering insights on the community and companies' experiences in accessing skills development offerings from the MQA.
- Exploring the potential synergies between skills development needs of the MMS for upskilling and reskilling the existing workforce for diversification into other sectors.
- Identifying potential partners and stakeholders relevant to addressing skills development needs in the province.

Insights from this research support evidence-based policy recommendations and strategic interventions by the MQA and relevant stakeholders, ensuring the sustainable development of the MMS and broader socio-economic empowerment of the Limpopo province.

1.5. Significance of the Study

The study holds strategic significance for:

- Enhancing the MQA's strategic and operational plans by providing a comprehensive understanding of province-specific skills requirements and gaps. This knowledge will facilitate the more effective allocation of funding to address community needs and ensure better alignment with sector skills plans.
- Supporting the implementation of the DDM by providing localised data on community and industry needs.
- Empowering communities through context-specific and responsive skills development initiatives.
- Fostering economic diversification and resilience by exploring pathways to integrate skills into non-mining sectors.
- Addressing key policy mandates from the Human Resource Development Strategy and the White Paper for Post-School Education and Training.

This is particularly important in Limpopo, where youth unemployment is currently 62,2% (Statistics South Africa, 2025b), and access to training is concentrated in urban nodes, leaving rural areas marginalised.

2. POLICY, LEGISLATIVE AND STRATEGIC FRAMEWORK

2.1. National Legislative and Policy Environment

South Africa's skills development and employment policy environment is shaped by a comprehensive set of legislative and strategic frameworks aimed at improving workforce capability, reducing unemployment, and promoting inclusive economic growth. Collectively, these policies establish the institutional architecture, strategic direction, and implementation mechanisms through which skills development is expected to contribute to labour-market participation and poverty reduction.

The Skills Development Act (SDA) No. 97 of 1998 provides the legal foundation for the national skills development system, mandating workplace-based learning, learnerships, and apprenticeships, and establishing key institutions such as the National Skills Authority (NSA), SETAs, and the National Skills Fund (Republic of South Africa, 1998). Building on this framework, the NSDP 2030 articulates a decisive shift toward demand-led skills development, emphasising alignment with occupations in demand, labour-market responsiveness, and measurable employment outcomes (Republic of South Africa, 2019).

At a macro level, the NDP 2030 positions skills development as a central driver of job creation, inclusive growth, and inequality reduction, recognising education and capability building as long-term enablers of economic participation (National Planning Commission, 2012). Complementing this, the White Paper for Post-School Education and Training (WP-PSET) and its implementation roadmap, the National Plan for Post-School Education and Training (NPPSET) 2021–2030, focus on strengthening the responsiveness, integration, and articulation of the post-school education and training system, with particular emphasis on access, quality, workplace learning, and progression pathways (Republic of South Africa, 2014; Department of Higher Education and Training (DHET), 2023b).

In addition, the Human Resource Development Strategy for South Africa (HRDS SA) 2030 provides an overarching framework for coordinating human resource development across the education, training, and employment system toward 2030. The strategy emphasises integrating skills development with workforce planning, labour-market intelligence, and employment outcomes, with a strong focus on lifelong learning and on improving the responsiveness of the skills system to changing economic conditions. By explicitly linking skills supply to labour-market demand, the HRDS SA reinforces national priorities aimed at reducing unemployment and poverty through a more coherent and coordinated human capital development system (Human Resource Development Council (HRDC), 2022a).

Economic and industrial policy frameworks further reinforce the role of skills development as a cross-cutting enabler of growth and employment. Instruments such

as the Industrial Policy Action Plan (IPAP), the Revised Medium-Term Strategic Framework (2019–2024), and the Economic Reconstruction and Recovery Plan link skills development to priority growth sectors, industrialisation, and post-crisis recovery, underscoring the importance of aligning training provision with sectoral demand (Department of Trade and Industry (DTI), 2018; Department of Planning, Monitoring and Evaluation, n.d.; Republic of South Africa, n.d.). Targeted interventions such as the Presidential Youth Employment Initiative and the Employment Tax Incentive Act further seek to improve the transition from learning to work, particularly for young people, by combining skills development with employment and enterprise incentives (South African Government News Agency, 2025; South African Revenue Service, 2025).

Across these frameworks, several consistent policy themes emerged from the literature. These included a shift from supply-led to demand-led skills planning; a strong emphasis on workplace-based learning as a pathway to employment; prioritisation of youth, women, rural learners, and historically disadvantaged groups; improved articulation and qualification pathways within the post-school system; and strengthened monitoring and evaluation to track employment and self-employment outcomes (Republic of South Africa, 2014; Republic of South Africa, 2019; Department of Higher Education and Training (DHET), 2023b). Effective implementation is repeatedly shown to depend on coordinated action among government, employers, training institutions, SETAs, and community stakeholders.

In conceptual terms, these national policy priorities align closely with Human Capital Theory, which holds that sustained investment in education, skills, and training enhances productivity, employability, and long-term economic growth (Leoni, 2023). By emphasising labour-market alignment, inclusion, and system-wide coordination, South Africa’s skills and employment frameworks seek to strengthen human capital development as a foundation for reducing unemployment and supporting sustainable development.

2.2. Sectoral Policies and Strategies

South Africa’s MMS is guided by a set of sector-specific policies and strategies aimed at strengthening technical capacity, supporting inclusive growth, and promoting long-term sector sustainability. These frameworks seek to leverage the country’s mineral endowment not only for extraction, but also for skills development, industrial upgrading, and employment creation across the broader mining value chain. Collectively, they reflect an understanding of the MMS as an interconnected system in which skills development, industrial policy, technology adoption, and labour-market outcomes are mutually reinforcing.

The White Paper on Minerals and Mining Policy (1998) established an early foundation for skills development in the sector by emphasising small-scale mining, beneficiation,

and community participation. It highlighted the importance of training and technical assistance to support historically disadvantaged communities and promote skills flexibility, particularly in enabling workers and communities to transition into alternative livelihoods as mining activities decline. In doing so, the policy implicitly recognised the interdependence between mining operations, community development, and skills systems (Department of Mineral and Petroleum Resources (DMPR), 1998).

The Critical Minerals and Metals Strategy 2025 introduced a more explicit systems-oriented approach by positioning South Africa's critical mineral resources within a wider ecosystem of green industrialisation, innovation, research, and skills development. The strategy emphasised the need for coordinated development across exploration, beneficiation, manufacturing, and research institutions to support emerging industries such as renewable energy, electric vehicles, and advanced manufacturing. This approach underscored that skills development outcomes depend not only on training provision but on alignment with industrial capabilities, technological change, and investment pathways across the value chain (Department of Mineral and Petroleum Resources (DMPR), 2025).

Similarly, the Beneficiation and Value-Addition Policy advanced a value-chain perspective that linked skills development to downstream processing and manufacturing rather than extraction alone. While acknowledging the limited employment impact of beneficiation at the refining stage, the policy highlighted the importance of developing complementary skills across manufacturing, logistics, and supporting industries to maximise employment potential. This reinforces a systems view in which labour absorption and skills utilisation are shaped by the interaction between multiple sectors, institutions, and stages of production (TIPS, 2024a).

Taken together, these sectoral strategies reflect a shift toward viewing skills development within the MMS as part of a broader, dynamic system involving industry, education and training institutions, communities, technology, and policy actors. From both a systems perspective and a Human Capital Theory standpoint, the literature suggests that sustainable employment outcomes in the MMS depend on coordinated interventions across this system, rather than isolated training initiatives. By promoting alignment across value chains and institutional actors, these policies aim to strengthen labour-market responsiveness, enhance skills utilisation, and support inclusive and sustainable economic growth within the sector.

2.3. Provincial Policies and Strategies

The Limpopo Province has articulated a strong commitment to inclusive growth, employment creation and economic resilience through provincial strategies that position skills development as a central driver of socio-economic transformation. These strategies recognise the province's continued reliance on the MMS, while simultaneously acknowledging the need to strengthen alternative and complementary

sources of growth to address continued unemployment, spatial inequality and poverty, particularly in rural and mining-affected communities.

The Limpopo Development Plan (LDP) provides the overarching medium- to long-term development framework for the province. It prioritises human capital development, employment creation and structural economic transformation through targeted growth in mining beneficiation, agriculture and agricultural processing, manufacturing, logistics, tourism and emerging green-economy sectors. Within this framework, skills development is positioned as a key enabler of economic diversification and labour-market adaptation, supporting both the modernisation of the mining sector and the expansion of non-mining value chains. The LDP emphasises the need to align education and training provision with provincial economic priorities and district-level development trajectories to support inclusive and sustainable growth (Limpopo Provincial Government, 2025b).

In addition to this economic focus, the Limpopo Department of Social Development's Strategic Plan reinforces the province's human capital agenda by linking social protection, community development and economic participation. The strategy positions skills development as a cornerstone of social and economic inclusion, with targeted interventions focused on youth and women empowerment, entrepreneurship, cooperative development and livelihoods-oriented skills programmes in rural communities. Through this approach, the Department extends its mandate beyond welfare provision, aiming to strengthen employability, independence and sustainable livelihoods, particularly in rural areas and former mining communities affected by structural labour-market change (Limpopo Department of Social Development, n.d.).

These provincial strategies reflect a shared recognition that sustainable economic growth and employment creation in Limpopo depend on sustained investment in human capability alongside economic diversification and social inclusion. By combining skills development with industrialisation, beneficiation, entrepreneurship and social development interventions, the province seeks to bridge the gap between social protection and economic participation. From a Human Capital Theory perspective, these strategies signal a shift away from short-term welfare responses toward long-term productivity enhancement, positioning education, skills acquisition and inclusion as critical factors toward the reduction of unemployment and a more resilient provincial labour market.

3. THEORETICAL FRAMEWORK

The study was guided by an integrated theoretical framework that combined Human Capital Theory as the primary analytical lens with complementary insights from Labour Market Mismatch Theory and Systems Theory. This framework provided a structured basis for analysing skills development, labour-market dynamics, and institutional coordination within the MMS in the Limpopo Province (Sreekumar, 2023).

Human Capital Theory, originating from Becker's work in 1964, underpinned the study's focus on education and skills development as drivers of productivity, employability, and economic growth (Almendarez, 2011; Auerbach & Green, 2024). The theory recognises both micro-level benefits, where individuals enhance their productivity and earning potential through education, and macro-level impacts, where aggregate educational attainment contributes to broader economic performance (Leoni, 2023). The literature further highlighted the role of education in promoting social participation, reducing poverty, and improving quality of life, particularly where access to education is expanded to disadvantaged groups (Leoni, 2023). However, critiques of Human Capital Theory were also acknowledged, including evidence that increased education expenditure does not automatically translate into economic growth and may reinforce existing inequalities, particularly in highly unequal contexts such as post-apartheid South Africa (Auerbach & Green, 2024; Harber & Mncube, 2011).

To address these limitations, Labour Market Mismatch Theory was incorporated to explain why education and training do not necessarily result in employment. Drawing on foundational work by Beveridge (1944) and later developments in search and matching theory by Diamond, Mortensen, and Pissarides (2010). The theory highlights how mismatches between skills supply and labour-market demand can persist due to structural change, geographic immobility, skills obsolescence, and institutional rigidities (Diamond, *et al.*, 2010). Structural unemployment was relevant to this study, as shifts in sectoral demand require reskilling or relocation that many workers are unable to achieve (Cambridge Dictionary, n.d.; International Labour Organisation (ILO), 2020; Rathelot, *et al.*, 2023). This perspective informed the study's interrogation of misalignments between training provision, employer needs, and employment outcomes in the Limpopo MMS.

Systems Theory further strengthened the analytical framework by situating skills development within a broader socio-economic system comprising interdependent actors and institutions. Originating from the work of von Bertalanffy (1950, 1968, 1972), Systems Theory emphasises the interactions, coordination mechanisms, and feedback loops among government departments, SETAs, education and training providers, employers, communities, and learners (Weilkiens, 2007; UNESCO, 2023). Within this study, a systems perspective highlighted how weak coordination, fragmented planning, and limited feedback between stakeholders constrained the

effectiveness of skills development interventions. Feedback loops, such as the need for curricula to adapt to technological change and industry demand, were identified as critical mechanisms influencing system responsiveness (Khan, et al., 2025).

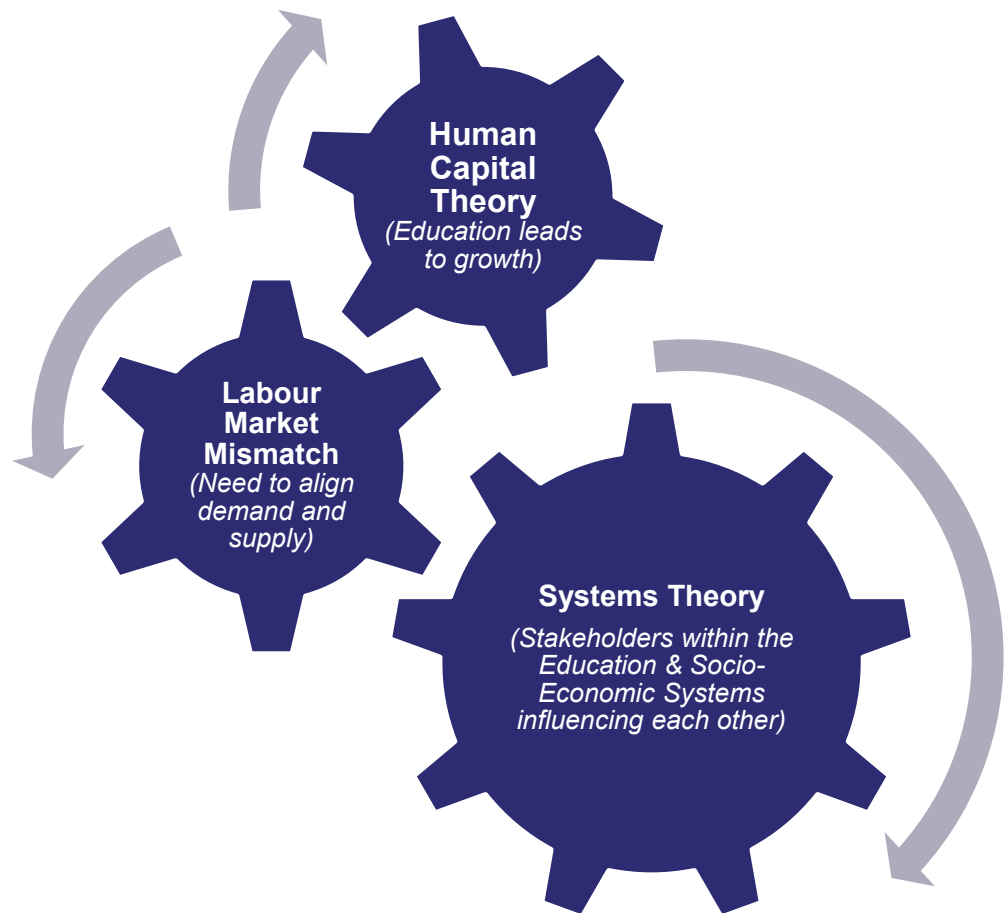


Figure 1: Theoretical Framework

Taken together, this integrated theoretical framework provided a coherent basis for analysing why investments in education and skills development in the Limpopo MMS had not consistently translated into improved employment outcomes or socio-economic mobility, as seen in the socio-economic status of the province, as discussed in section 5.1. Human Capital Theory justified skills investment as a necessary foundation for development, Labour Market Mismatch Theory explained persistent unemployment despite training provision, and Systems Theory illuminated the institutional and coordination failures that limited skills utilisation. Collectively, these perspectives informed the study's analysis of skills demand, supply, and systemic alignment and guided the interpretation of findings presented in subsequent sections.

4. METHODOLOGY

4.1. Research Design

This study adopted a mixed-methods research design, integrating both qualitative (understanding experiences and non-numerical data) and quantitative (numerical data) approaches (McLeod, 2024). The rationale was to gain a comprehensive and contextualised understanding of the MMS-related skills development needs and gaps in the Limpopo province. Quantitative methods captured statistical data on employment trends, skills shortages, and institutional outputs (including secondary data), while qualitative methods were used to explore experiences, perceptions, and implementation challenges from stakeholders.

A convergent parallel design was utilised, which involves undertaking quantitative and qualitative data collection concurrently, followed by interpretation (McLeod, 2024).

The skills development landscape is complex and influenced by socio-economic, policy, and institutional variables that cannot be fully understood through a single methodological lens. The mixed-methods design enables triangulation, enhances both depth and breadth of insights, and supports evidence-based recommendations with both statistical and contextual relevance (McLeod, 2024).

4.2. Sampling and Target Groups

The study employed a stratified purposive sampling approach to ensure relevance, representation, and meaningful engagement with stakeholders involved in, affected by, or influencing skills development within Limpopo's MMS. This approach was appropriate given the multi-stakeholder nature of the study and the use of both quantitative and qualitative data collection methods (EBSCO Knowledge Advantage, 2025).

During the inception phase of the study, it was determined that community sampling would be informed by census data and that all district and metropolitan municipalities would be included. The research team subsequently assessed the feasibility of this approach in consultation with internal fieldwork coordinators. Population estimates at the district level were reviewed to determine appropriate community sample sizes.

Table 2: District municipality population sizes

District Municipalities	Population Size	Required Sample Size
Waterberg	745 758	384
Capricorn	1 330 436	385
Sekhukhune	1 169 762	385
Vhembe	1 393 949	385

Mopani	1 159 185	385
	Total	1 924

Using Cochran’s formula with a 95% confidence level and a 5% margin of error, a minimum community sample of 1 924 respondents was calculated as necessary to achieve statistical representativity across the five district municipalities (Johnson, 2025). However, due to budgetary and project timeline constraints, it was not feasible to undertake a direct community survey at this scale.

As a mitigation measure, Ward Councillors were used as proxies for community perspectives. This approach was adopted because Ward Councillors form a defined and contactable population, are geographically spread across all municipalities, and are elected representatives with a mandate to understand and articulate community needs. A structured, three-tier contact approach (email, SMS, and telephonic follow-up) was implemented to maximise participation while remaining within project constraints. This method allowed the study to gather community-level insights in a cost-effective and methodologically robust way.

A feasible quantitative sample across stakeholder categories was then calculated using a 95% confidence interval and a 5% margin of error (Calculator.net, 2025). The sampling reflected the number of representatives within each stakeholder group rather than single institutional entities.

Table 3: Quantitative Sampling

Stakeholder Group	Targeted Sample	Available, Valid & Unique Contact Details	Participated	Sample %
¹ MMS Employers	193	89	11	12,4%
² Skills Development Facilitators	144	121	55	45,5%
³ Education Institutions (Uni, TVETS)	12	10	4	40,0%
³ Training Providers	53	37	6	16,2%
Government Officials	57	27	5	18,5%
Labour Unions	7	0	0	0
⁴ Ward Councillors	568	211	85	40,3%
Total	997	502	169	33,7%

1 Source: 2025 WSP data received from the MQA & De Water, 2025.

2 Source: 2025 WSP data received from the MQA.

3 Source: 2025 Accredited Training Providers and Programme Approvals from the MQA, DHET (2025a), Department of Basic Education (2025a), DHET (2025b).

4 Source: Electoral Commissions of South Africa, 2025.

The quantitative sample included representatives from MMS employers, skills development facilitators, education and training institutions, training providers, government officials, organised labour, and Ward Councillors. Education and training

providers included public TVET colleges, universities, and accredited private providers. Government officials were drawn from SETA's, provincial departments and district and local municipalities, while organised labour representatives reflected worker perspectives within the mining sector.

Where valid contact details could not be obtained, population and sample sizes were adjusted accordingly. Online surveys were distributed to all stakeholders for whom valid contact information was available, with follow-up calls conducted.

In terms of district representation, stakeholders participated from every district municipality.

Qualitative methods were used to complement the survey data and to generate deeper insights into institutional dynamics, coordination challenges, and emerging opportunities within the skills development system. Stakeholders who participated in the online survey were requested to indicate their willingness to participate in key informant interviews and focus group sessions. Only where permission was granted to participate were participants contacted.

Table 4: Qualitative Sampling

Data Collection Method	Stakeholder Group	Targeted Sample Size (Representatives)	Actual Sample Achieved	Purpose
Key Informant Interviews	Senior Stakeholders (e.g. MQA, TVET Heads)	20 - 25	6 interviews.	Gather strategic and operational insights
Focus Group Discussions	Multi-stakeholder groups	6 groups (~8 each)	2 focus groups.	Understand experiences and needs

Qualitative data collection comprised key informant interviews and virtual focus group discussions (FGDs).

4.3. Data Collection

Quantitative data were collected using structured online surveys administered to key stakeholder groups within the skills demand and supply value chain of the MMS in the Limpopo Province. The stakeholder groups included employers operating within the MMS, education and training institutions (including TVET colleges, universities, and SETA-accredited providers), government officials, and representatives of communities in mining-affected areas.

Online surveys were utilised to reach a broad and geographically dispersed stakeholder base and to maximise the volume and consistency of data collected. This

method was appropriate given its cost and time efficiency, its capacity to reach large numbers of respondents, and the flexibility it afforded participants to respond at a time most suitable to them. In addition, online surveys provided a greater degree of anonymity than face-to-face methods and supported improved data accuracy through standardised question formats (Cleave, 2023).

The online survey was launched on 19 November 2025 and was closed at the end of the day on 05 December 2025. From 19 November 2025 until 30 November 2025, a team of two fieldworkers were following up with potential respondents to encourage participation. Starting from 01 December 2025, an additional six fieldwork members were mobilised to follow up on respondents. Attempts were made to reach each stakeholder 4 - 5 times, after which they were indicated as non-responsive. In addition, a total of 128 stakeholders informed the fieldwork team that they did not wish to participate and that they should be removed from the database.

Qualitative data collection complemented the survey findings and provided deeper insight into institutional dynamics, coordination challenges, and contextual factors influencing skills development in the province. Qualitative methods included semi-structured key informant interviews and focus group discussions.

Key informant interviews were conducted with selected subject matter experts and were semi-structured to allow for consistency across respondents while providing sufficient flexibility to explore emerging issues in depth. Interviews were conducted using online platforms, such as Microsoft Teams®, or telephonically, depending on participant availability. Interviews were used to elicit expert perspectives on policy effectiveness, operational challenges, skills gaps, and opportunities within the MMS skills ecosystem (McFarlen, n.d.).

Focus group discussions were scheduled with multi-stakeholder groupings, including representatives from industry, education and training institutions, Ward Councillors, and government officials. Focus groups enable real-time engagement, facilitate in-depth discussion, and allow for iterative feedback among participants. This method is particularly useful for exploring shared experiences, differing perspectives, and cross-sectoral challenges related to skills development and employment pathways (Broder , 2024).

Stakeholders were selected on the basis that they were either directly impacted by skills development outcomes or had a direct influence on skills planning, provision, and utilisation within the MMS and the broader Limpopo provincial economy (Rabinowitz, 2025) and where permission was granted to contact them.

Despite the original research design providing for 20 - 25 key informant interviews and six focus group discussions with 6 - 8 participants each, actual participation levels were significantly lower than anticipated. Only six interviews were completed, and two

focus groups were convened: one with three participants and one with four, despite invitations being extended to approximately 33 stakeholders and later expanded to 34. While disappointing, this level of non-participation is not uncommon in applied policy and sectoral research, particularly in contexts characterised by stakeholder fatigue, competing operational priorities, and limited institutional capacity. The low response rate may indicate broader systemic challenges within the Limpopo skills ecosystem, including constrained stakeholder availability, weak coordination across institutions, limited incentives for engagement, and possible consultation fatigue arising from multiple concurrent policy and research processes. It may also reflect the realities of organisational instability and resource pressures within both public and private sector entities. Importantly, the poor participation itself constitutes a meaningful finding, signalling gaps in stakeholder responsiveness and engagement that have implications for the effectiveness of coordinated skills planning and implementation. These limitations were taken into account in the interpretation of findings, with greater reliance placed on triangulation between the literature review, quantitative survey data, and available qualitative insights.

4.4. Data Analysis

4.4.1. Quantitative Data Analysis

Quantitative data was collected using an online survey. Due to the varying sample sizes across stakeholder groups and regions, a descriptive statistical approach was adopted to ensure accuracy and transparency.

The analysis followed a three-stage process:

1. Descriptives: A frequency table was generated for every variable within the dataset. To maintain statistical integrity, a sample size threshold was applied to the reporting format:
 - Raw counts (N): Were used for smaller sample groups ($N < 15$) to avoid misleading generalisations or artificially volatile percentage shifts. Such disclaimers were included in the synthesis section (described below).
 - Percentages (%): Were used only where sample sizes were sufficiently robust ($N > 15$) to indicate meaningful trends.
2. Visualisation: To facilitate immediate visual interpretation, charts were generated for all datasets, regardless of sample size. This ensures a consistent presentation format throughout the report, allowing stakeholders to scan data patterns easily.
3. Synthesis: Finally, a qualitative review of the data was conducted to extract high-level insights. These are presented in Section 5 as key findings for each stakeholder group, synthesising the raw numbers into narrative themes regarding barriers, collaboration, and future skills needs.

4.4.2. Qualitative Data Analysis

Qualitative data obtained from the semi-structured interviews and focus group discussions were analysed using a thematic analysis approach. Interview and focus group transcripts were reviewed systematically to identify recurring patterns, points of convergence, and areas of divergence across stakeholder perspectives. An initial coding process was undertaken to categorise responses related to skills demand, skills supply, labour-market alignment, institutional coordination, and implementation challenges. These codes were then grouped into higher-order themes aligned with the study's conceptual framework, particularly Human Capital Theory, Labour Market Mismatch Theory, and Systems Theory. Comparative analysis was applied to assess consistency between stakeholders in the focus group discussions. This process enabled the triangulation of qualitative findings with literature review evidence and quantitative survey results, strengthening the robustness and interpretive validity of the analysis.

4.5. Reliability, Validity and Ethical Considerations

To enhance the reliability of the study, the following activities have been undertaken:

- Standardised administration: Enumerator manual, scripted introductions, uniform prompts, mock interviews, and spot-checks during the field work.
- Data quality controls: Programmed skip logic, range checks, required fields, timestamps, and duplicate detection; daily QC reports and supervisor sign-off.
- Version control and audit trail: Locked instrument versions; change logs; documented protocol deviations.

Validity has been reinforced by:

- Triangulation: Integrating multiple data sources (e.g., surveys, interviews, documents), methods (quant/qual), and investigators (cross-checking).
- Member checking (qualitative): Verifying emergent themes with selected participants or stakeholder representatives.
- External validity/transferability: Stratified sampling aligned to the study population, with application of non-response weightings where appropriate.
- Bias mitigation through social desirability/response bias: Neutral wording, anonymity assurances, indirect questioning where needed.
- Ethical integrity: Confidential handling and clear consent to encourage accurate disclosure, reinforcing measurement validity.

The University of Pretoria has strict guidelines related to ethics within research. Below is an excerpt of relevant details from the Code of Ethics for Scholarly Activities (University of Pretoria, n.d.).

- Responsibilities of the Researcher to Human Participants

- Ethical Approval: Researchers must obtain approval from the relevant Ethics Committee before conducting research involving human participants.
- Risk-Benefit Evaluation: Researchers must assess potential risks and benefits, minimise harm, and ensure benefits outweigh risks, especially for vulnerable groups.
- Informed Consent: Researchers must ensure voluntary participation, provide comprehensive study information, and adapt communication to participants' understanding.
- Selection of Participants: Participants must be selected fairly; vulnerable populations should not be exploited; inclusion must be justified.
- Privacy and Confidentiality: Researchers must protect participant data and consider cultural norms for privacy.
- Ongoing Responsibility: Researchers must monitor harm, respect withdrawal rights, and address emerging risks or issues during the study.
- Rights of Human Participants:
 - Autonomy and Voluntary Participation: Participants have the right to make an informed decision and withdraw at any time without penalty.
 - Informed Consent: Participants must receive complete and understandable information and provide consent freely, without coercion.
 - Protection from Harm: Participants must be shielded from foreseeable physical, psychological, or social harm.
 - Privacy and Confidentiality: Participants have the right to keep personal information private and secure.
 - Fair Treatment and Justice: Research burdens and benefits should be distributed equitably across groups.
 - Respect and Dignity: Participants must be treated with cultural sensitivity and their preferences acknowledged.

4.6. Limitations and Delimitations

Limitations in a research study refer to practical or theoretical constraints that are beyond the control of the researcher and cannot be fully mitigated, even where corrective measures are considered (Viera, 2023). In this study, several limitations were identified that influenced the scope, depth, and interpretation of the findings.

Firstly, the study experienced lower-than-anticipated participation levels, particularly in the qualitative component. Although the research design had provided for a substantially larger number of interviews and focus group discussions, stakeholder availability and responsiveness were limited. This resulted in a reduced number of completed interviews and focus group participants, constraining the breadth of qualitative insights obtained. Such non-participation is not uncommon in applied policy research and may reflect stakeholder fatigue, competing operational priorities, or

limited institutional capacity. Importantly, the low response rate itself constituted a meaningful contextual finding, pointing to broader challenges related to stakeholder engagement and coordination within the provincial skills development system.

Secondly, the study was subject to potential non-response bias in the quantitative survey data, as participation depended on stakeholders' willingness and availability to respond. While multiple follow-up attempts were made using different communication channels (i.e. phone calls and text messages), uneven response rates across stakeholder groups and regions remained a limitation.

Thirdly, logistical challenges were encountered in reaching stakeholders in remote and informal mining areas. Addressing these challenges would have required additional fieldwork resources and time beyond what was available within the approved project budget and timelines.

Fourthly, sampling constraints emerged following the shift to district-level sampling, which was confirmed during the inception meeting. This change in scope was not accompanied by a corresponding adjustment to the project budget, which had already been reduced at the contracting stage. As a result, methodological compromises were required, including the use of Ward Councillors as proxies for broader community perspectives. While this approach was methodologically defensible and practical under the circumstances, it nonetheless limited the depth of direct community-level data.

Finally, data quality constraints were noted regarding the availability and accuracy of stakeholder contact details. These details were sourced from publicly available databases or provided by partner institutions, and systematic verification fell outside the scope and resources of the study. In some cases, incomplete or outdated contact information reduced the effective sample size.

Delimitations define the intentional boundaries of a study, enabling analytical focus while acknowledging contextual constraints (DiscoverPhDs, 2020). In this instance, the study was deliberately limited to the Limpopo Province of South Africa and focused on skills development within the MMS and its provincially relevant value chains. While the analysis considered linkages to adjacent sectors such as agriculture and manufacturing, the study did not constitute a comprehensive skills-demand and supply analysis across all sectors of the provincial economy. The findings should therefore be interpreted within the specific context of the MMS and related transition pathways.

5. RESULTS AND DISCUSSION

5.1. Socio-Economic Landscape of the Province

This chapter presents a consolidated socio-economic profile of the Limpopo province, positioning the demographic, educational and labour market characteristics within established human capital and labour market mismatch theories. Human Capital Theory suggests that investments in education and skills enhance individual productivity and broader economic growth (Almendarez, 2011; Leoni, 2023). However, persistent unemployment, particularly among youth and women, suggests the presence of structural mismatches between skills supply and labour market demand (Auerbach & Green, 2024). These dynamics are particularly salient in the Limpopo, a predominantly rural province undergoing a gradual transition from mining towards services, trade and manufacturing (Statistics South Africa, 2025c; TIPS, 2024a).

5.1.1. Locality

The Limpopo province is located in the northernmost part of South Africa and consists of five district municipalities that are subdivided into 22 local municipalities. Currently, there is no metropolitan municipality within the Limpopo province; however, the Polokwane Local Municipality is progressing towards achieving this status (Municipalities.co.za, 2025).

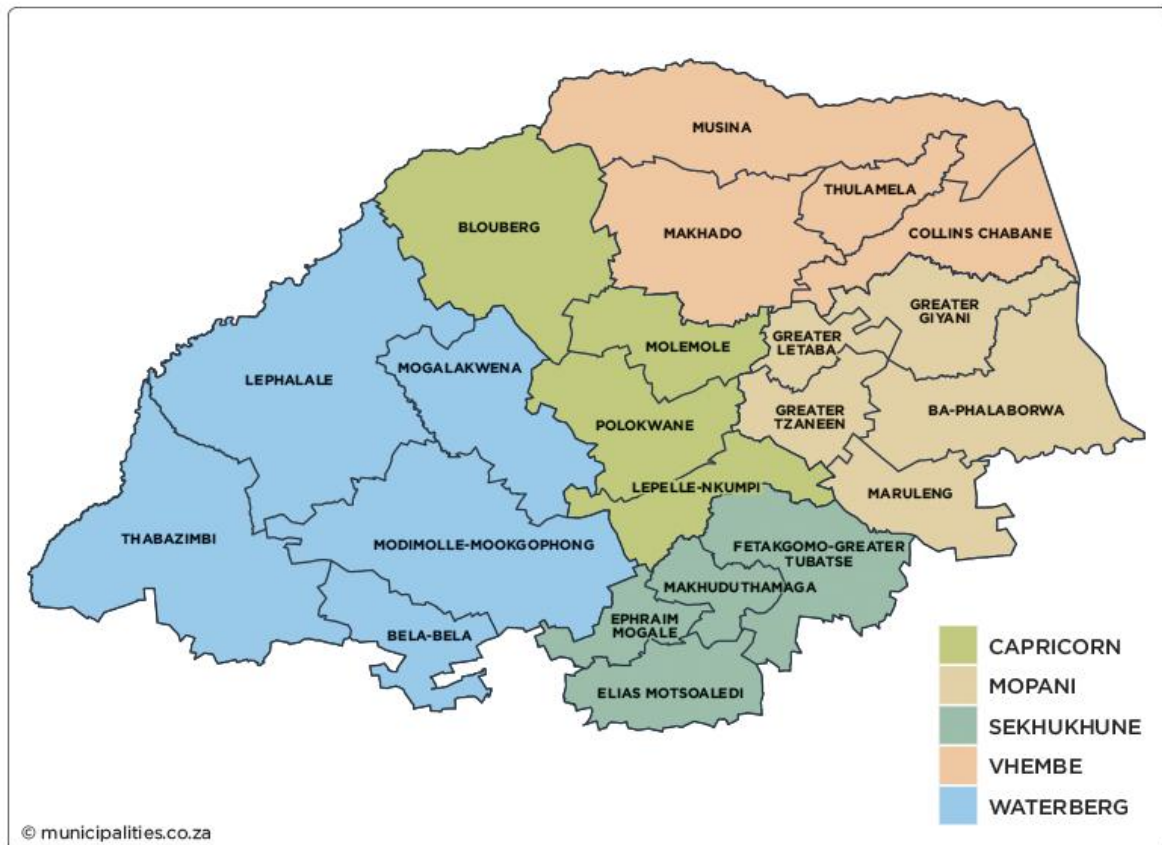


Figure 2: Limpopo Municipalities

Source: *Municipalities.co.za (2025)*

It is a rural province mainly made up of mountains, farmland, bushveld and mines, and it is ranked fifth largest in South Africa geographically, as well as having the fifth highest population density in South Africa (Municipalities.co.za, 2025). The province has a population of approximately 6.4 million people, which is an increase of 22% from the 2011 census (Statistics South Africa, 2025c).

5.1.2. Demographic profile

The Limpopo province has the lowest percentage distribution of population within South Africa, with a slight decline from 1996 - 2001, followed by a consistent incline over the period of 2001 - 2022 (Statistics South Africa, 2025c). However, the population of the province has increased by 22% since 2011 (Statistics South Africa, 2025c).

Table 5: *Limpopo Population 1996 - 2022*

Census year	Male	Female	Total
1996	2 095 241	2 480 892	4 576 133
2001	2 271 809	2 723 653	4 995 462
2011	2 524 136	2 880 732	5 404 868
2022	3 099 416	3 473 304	6 572 721

Source: *Statistics South Africa (2025c)*

The majority of the population is female, and this has remained consistent since 1996 (Statistics South Africa, 2025c).

The population has increased in all district municipalities since the 2011 census. Population numbers within Vhembe District Municipality have exceeded 1.6 million in the 2022 census, making this district municipality the largest within Limpopo (Statistics South Africa, 2025c).

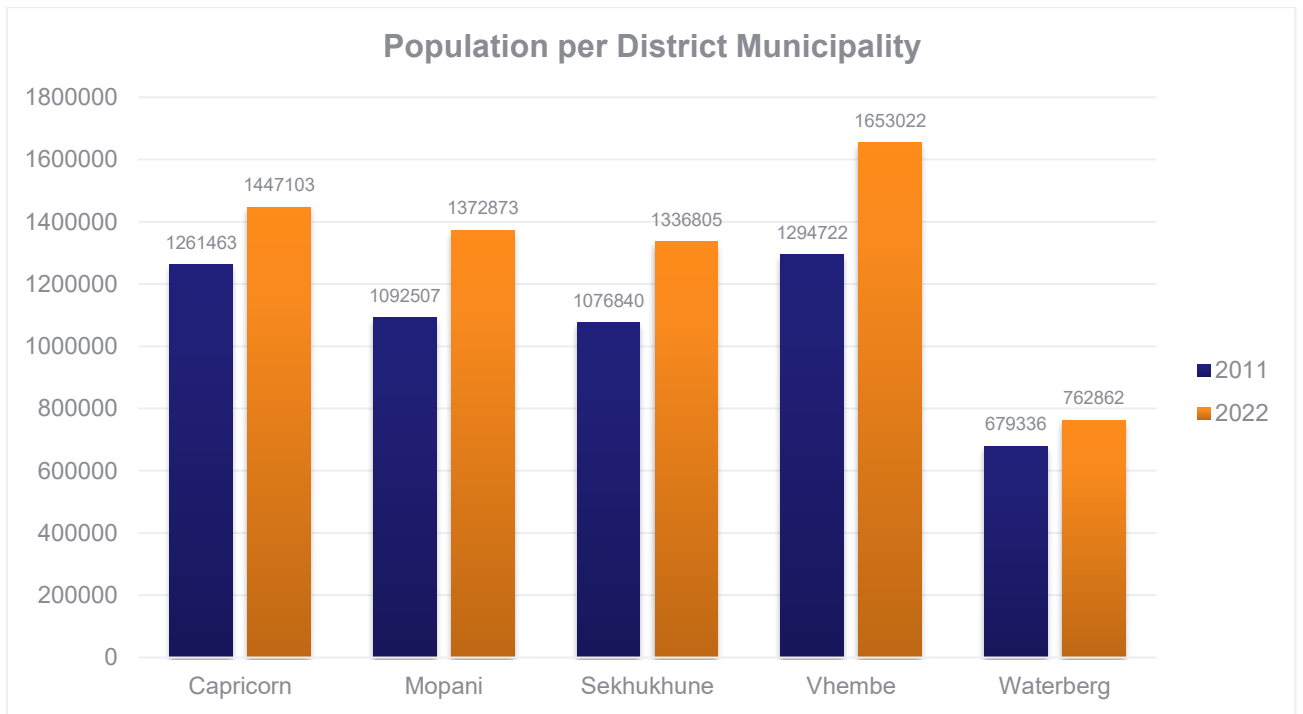


Figure 3: Population by district municipality

Source: Statistics South Africa (2025c)

The majority of the population is Black African (96.5%) (Statistics South Africa, 2025c). This number has remained consistent since 1996. All other population groups have also remained consistent since 1996. However, the population group classified as 'Other' were recorded for the first time in 2011, and this number also reduced in the 2022 census.

Table 6: Distribution by population group

Census year	Black African	Coloured	Indian/Asian	White	Other
1996	96.9%	0.2%	0.1%	2.8%	0.00%
2001	97.0%	0.2%	0.2%	2.7%	0.00%
2011	96.7%	0.3%	0.3%	2.6%	0.2%
2022	96.5%	0.3%	0.5%	2.5%	0.1%

Source: Statistics South Africa (2025c)

In terms of the age profile, most of the population is between the ages of 0 and 39 years, with Vhembe District Municipality having the greatest proportion of youth (Statistics South Africa, 2025c).

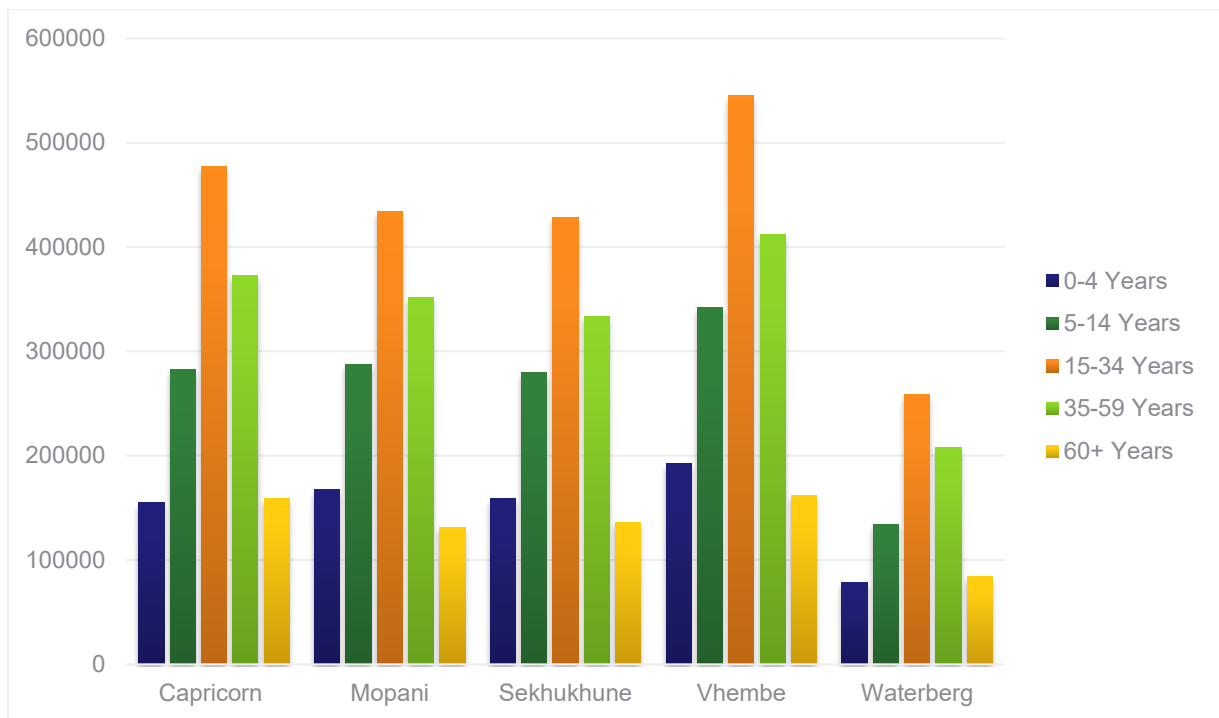


Figure 4: Distribution by Age

Source: Statistics South Africa (2025c)

5.1.3. Education profile

The majority of the population over the age of 20 has completed secondary schooling (42.9%). The second largest group is those of the population who have completed some secondary schooling (29.2%). In terms of post-school qualifications, this has been attained by 16.2% of the population.

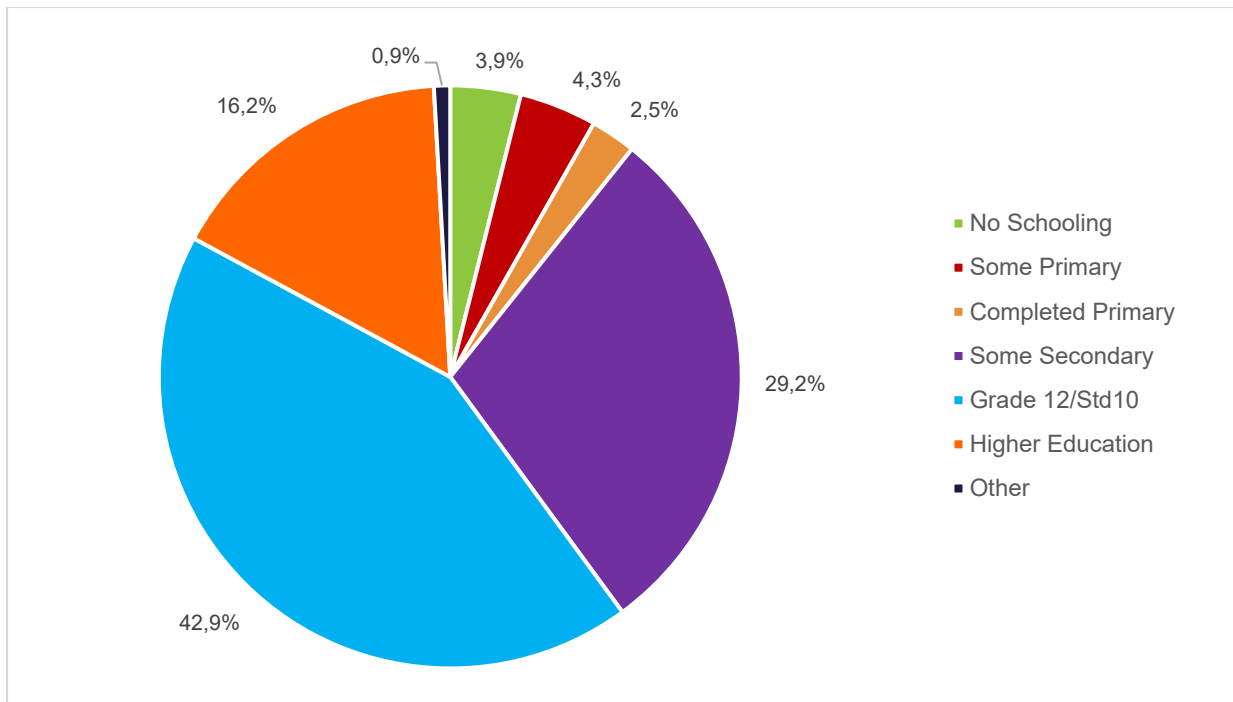


Figure 5: Educational levels attained

Source: Statistics South Africa (2025c)

5.1.4. Type of households

The total number of households in all five district municipalities in Limpopo has increased significantly from 2011 to 2022 (between 20% and 40% increase). However, the average household sizes have decreased in all districts except for Mopani, showing a slight increase from 3.7 to 3.8 average household size (Statistics South Africa, 2025c).

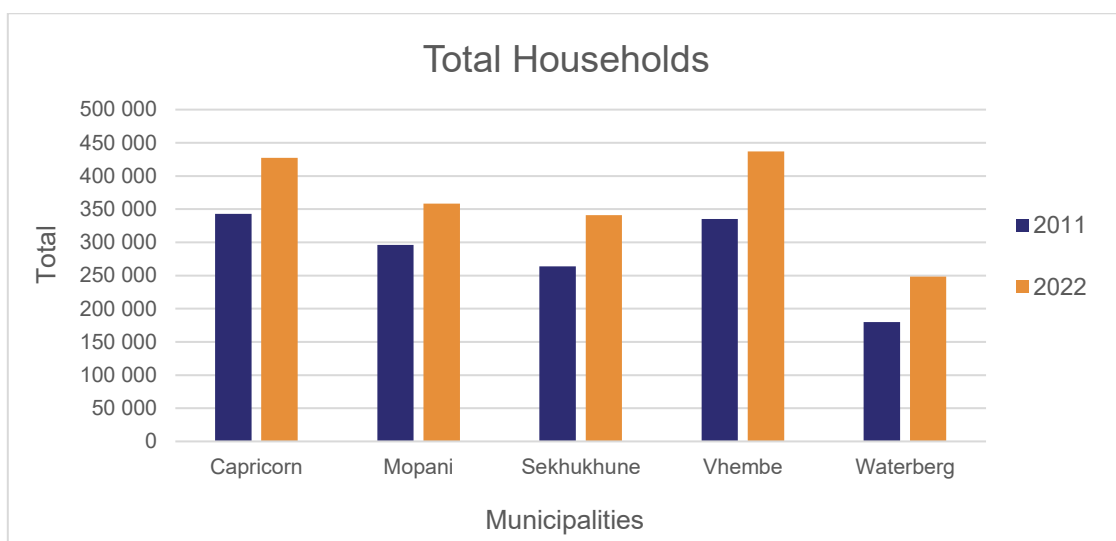


Figure 6: Total Households

Source: Statistics South Africa (2025c)

Table 7: Average Household Size

Municipality	2011	2022
	Average Household Size	Average Household Size
Capricorn	3.7	3.4
Mopani	3.7	3.8
Sekhukhune	4.1	3.9
Vhembe	3.9	3.8
Waterberg	3.8	3.1

Source: Statistics South Africa (2025c)

In terms of dwelling type, the number of formal dwellings has increased across all district municipalities by between 25% and 45% from 2011 to 2022. The Waterberg District Municipality has had the largest increase (45.5%) of formal dwellings, with Sekhukhune District Municipality showing the largest decrease in traditional and informal dwellings (49%) (Statistics South Africa, 2025c).



Figure 7: Dwelling type

Source: Statistics South Africa (2025c)

The number of households with access to regional/local water schemes has increased by 13% since 2011, and the same change is noted in access to flush toilet facilities. In terms of energy for cooking, most municipalities had a slight decrease in electricity demands, with all municipalities showing a significant increase in demand for gas (Statistics South Africa, 2025c).

5.1.5. Economic landscape

Globally, there is an anticipated decline of 2.7% in growth from the 3.3% observed in 2024; recovery is projected to occur in 2026 at 3% (Limpopo Provincial Treasury, 2025). The growth forecast for South Africa is estimated to range from 1% to 1.8% (Limpopo Provincial Treasury, 2025), while the Organisation for Economic Co-operation and Development (OECD) places this estimate at 1.3% (OECD, 2025). Enhanced investment support is facilitated by the improved accessibility of electricity and the relaxation of monetary policy. Simultaneously, the pension reforms implemented in 2024 contribute to increased public consumption by facilitating access to retirement savings (OECD, 2025). The 10% import tariffs imposed by the United States on selected South African items have a limited impact on the GDP due to the exclusion of gold bullion and certain critical minerals (OECD, 2025).

Nationally, the expanded unemployment rate for the second quarter of 2025, encompassing both job seekers actively seeking employment and discouraged job seekers, exhibited a decline to 42,9%, from the percentage recorded in the first quarter of 2025, which was 43.1% (Statistics South Africa, 2025b).

Table 8: National Employment Figures 2025: Q2

	Apr-Jun 2024 (Thousand)	Jan-Mar 2025 (Thousand)	Apr-Jun 2025 (Thousand)	Qtr-to-qtr change (Thousand)	Year-on-year change (Thousand)	Qtr-to-qtr change (%)	Year-on-year change (%)
Population 15-64 years	41 296	41 691	41 822	131	526	0.3	1.3
Labour force	25 036	25 015	25 174	159	138	0.6	0.6
Employed	16 652	16 787	16 807	19	154	0.1	0.9
Formal sector (non-agricultural)	11 467	11 434	11 468	34	2	0.3	0
Informal sector (non-agricultural)	3 129	3 345	3 326	-19	197	-0.6	6.3
Agriculture	896	930	906	-24	10	-2.6	1.1
Private households	1 160	1 078	1 106	28	-54	2.6	-4.7
Unemployed	8 384	8 228	8 367	140	-16	1.7	-0.2
Not economically active	16 260	16 676	16 648	-28	388	-0.2	2.4
Discouraged work-seekers	3 195	3 473	3 445	-28	250	-0.8	7.8
Other (not economically active)	13 065	13 203	13 203	0	138	0	1.1
Unemployment rate (%)	33.5	32.9	33.2	0.3	-0.3	0.3	-0.3
Employed/population ratio (absorption) (%)	40.3	40.3	40.2	-0.1	-0.1	-0.1	-0.1
Labour force participation rate (%)	60.6	60	60.2	0.2	-0.4	0.2	-0.4

Source: Statistics South Africa (2025b)

Provincially, the Limpopo Province has been experiencing increases in employment levels since April 2024, with the increase in the last quarter being 27 000 (Statistics South Africa, 2025b).

Table 9: Provincial Employment Figures 2025: Q2

Province	Apr-Jun 2024	Jan-Mar 2025	Apr-Jun 2025	Qtr-to-qtr change (Thousand)	Year-on-year change (Thousand)	Qtr-to-qtr change (%)	Year-on-year change (%)
South Africa	16 652	16 787	16 807	19	154	0.1	0.9
Western Cape	2 675	2 861	2 744	-117	69	-4.1	2.6
Eastern Cape	1 369	1 373	1 462	89	93	6.5	6.8
Northern Cape	314	343	314	-28	0	-8.3	0.1
Free State	745	754	766	12	21	1.6	2.8
KwaZulu-Natal	2 842	2 788	2 702	-86	-140	-3.1	-4.9
North-West	887	879	895	16	8	1.8	0.9
Gauteng	5 103	5 091	5 186	95	83	1.9	1.6
Mpumalanga	1 192	1 212	1 223	11	31	0.9	2.6
Limpopo	1 526	1 488	1 515	27	-11	1.8	-0.7

Source: Statistics South Africa (2025b)

The overall unemployment rate in Limpopo Province has increased by 1.7 percentage points for Q2:2025 and by 3.6 percentage points for the year. However, the expanded unemployment rate for Limpopo has decreased by 0.9 percentage points for Q2:2025, but has increased by 0.6 percentage points from the previous year (Statistics South Africa, 2025b). The quarterly decrease in the expanded unemployment rate for the Limpopo labour market indicates a reduced level of discouragement among job seekers, even though the official unemployment rate for Q2:2025 has increased. This suggests that a greater number of individuals are re-entering the labour force, yet the economy has not generated sufficient employment opportunities to accommodate them. Consequently, persistent structural challenges persist in the labour market's ability to absorb these individuals.

The figure below provides a summary of key employment figures by province. The Limpopo Province records a higher percentage of unemployment, according to the standard and expanded definitions, when compared to the national figures. The absorption rate (37.1%) is slightly lower than the national average of 40.2%, as well as the labour force participation rate at 57%, as opposed to the national 60.2% (Statistics South Africa, 2025b).

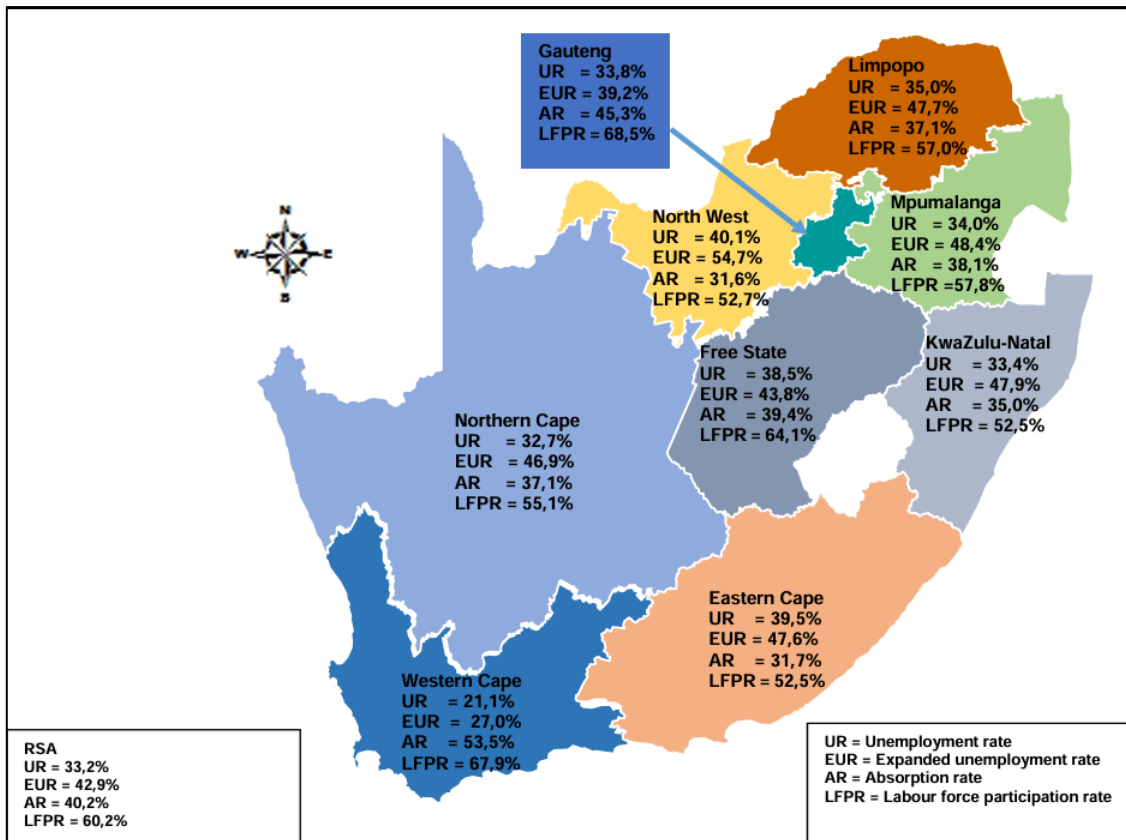


Figure 8: Summary of employment figures by province

Source: Statistics South Africa (2025b)

The youth in South Africa, i.e. individuals aged 15 - 34, are experiencing an alarming rate of unemployment. Unemployment among youth has remained around 46% for the past year; this value increases when considering the 15 - 24 age group, which is currently at 62.2% (Statistics South Africa, 2025b).

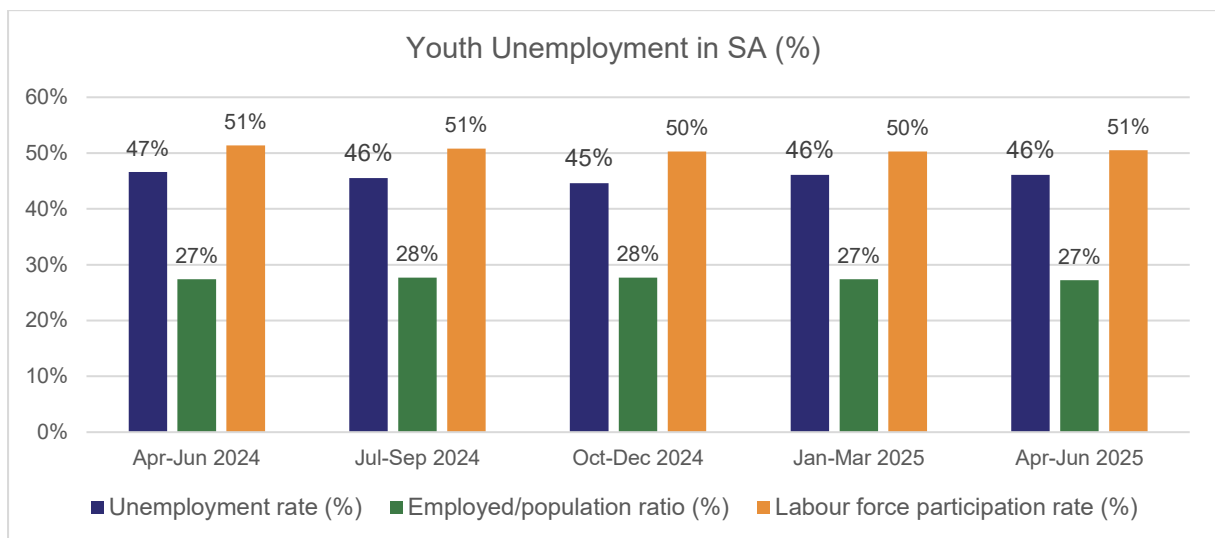


Figure 9: Youth (aged 15 - 34) unemployment in South Africa

Source: Statistics South Africa (2025b)

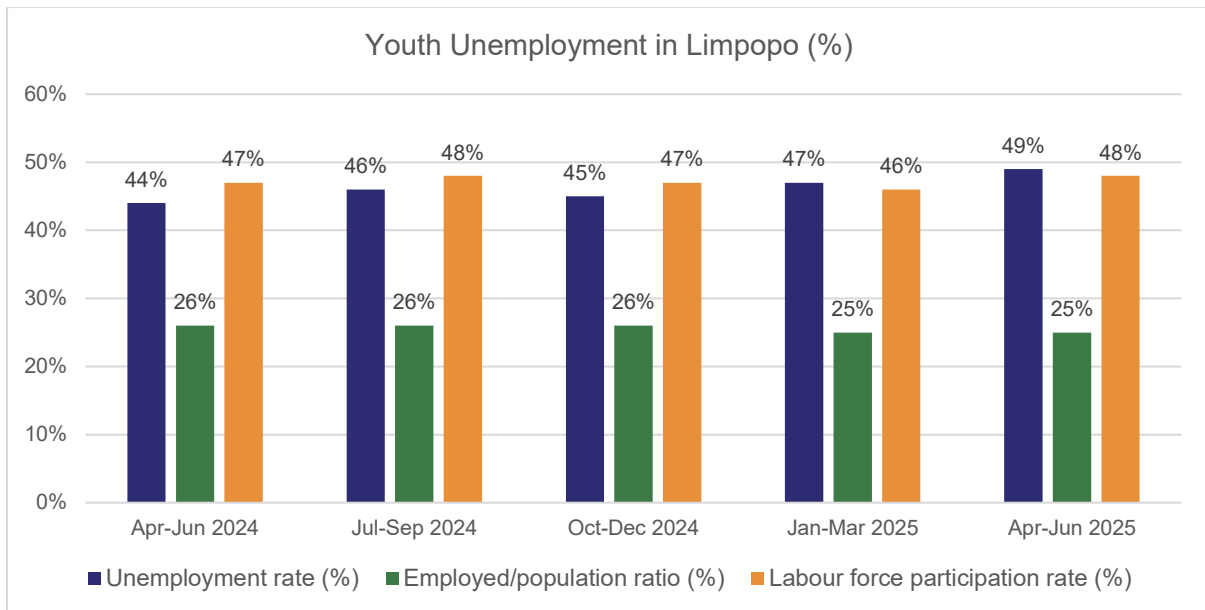


Figure 10: Youth (aged 15 - 34) unemployment in Limpopo

Source: Limpopo Provincial Treasury (2025)

In terms of gender, it was observed that the unemployment rate of women in Limpopo has slightly decreased from 34.3% in 2020 to 33.9% in 2024. Whilst the unemployment rates for men during the same period were 32.5% (in 2020) and 31.9% (in 2024), the unemployment rate for women in this province remains consistently higher than that of men (Limpopo Provincial Treasury, 2025).

Considering the data presented and reviewed, the labour market in Limpopo Province demonstrates contrasting trends, with the official unemployment rate rising by 1.7 percentage points in Q2:2025 and 3.6 points from the previous year, whilst the expanded unemployment rate declined by 0.9 points for Q2:2025 but increased by 0.6 points annually. These trends suggest that job creation in the province remains insufficient to absorb a growing labour force, even considering some previously discouraged individuals re-entering the market. Addressing this inconsistency requires targeted efforts to stimulate inclusive job creation through investment and enterprise support, alongside strengthened labour market programmes to improve skills development and employment placement, towards mitigating the rising labour market pressure and promoting sustainable growth.

In 2023, the Limpopo province contributed 7.6% to the national GDP (Limpopo Provincial Treasury, 2025). Mining contribution to provincial GDP has increased to 19%, and the four largest industries within the Limpopo, in terms of contribution to provincial GDP in 2024, were Personal Services (22%), Mining (19%), Finance (13%) and Trade (12%) (Statistics South Africa, 2025c).

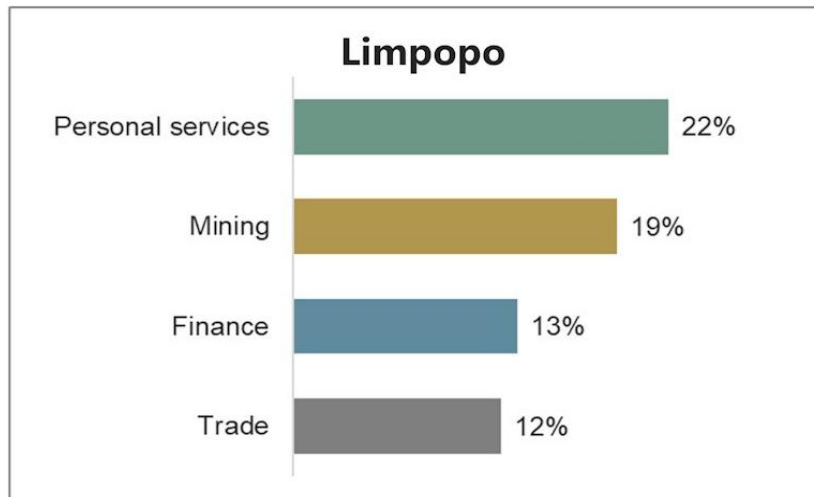


Figure 11: The four largest industries in the Limpopo Province (% contribution to provincial GDP)

Source: Statistics South Africa (2025c)

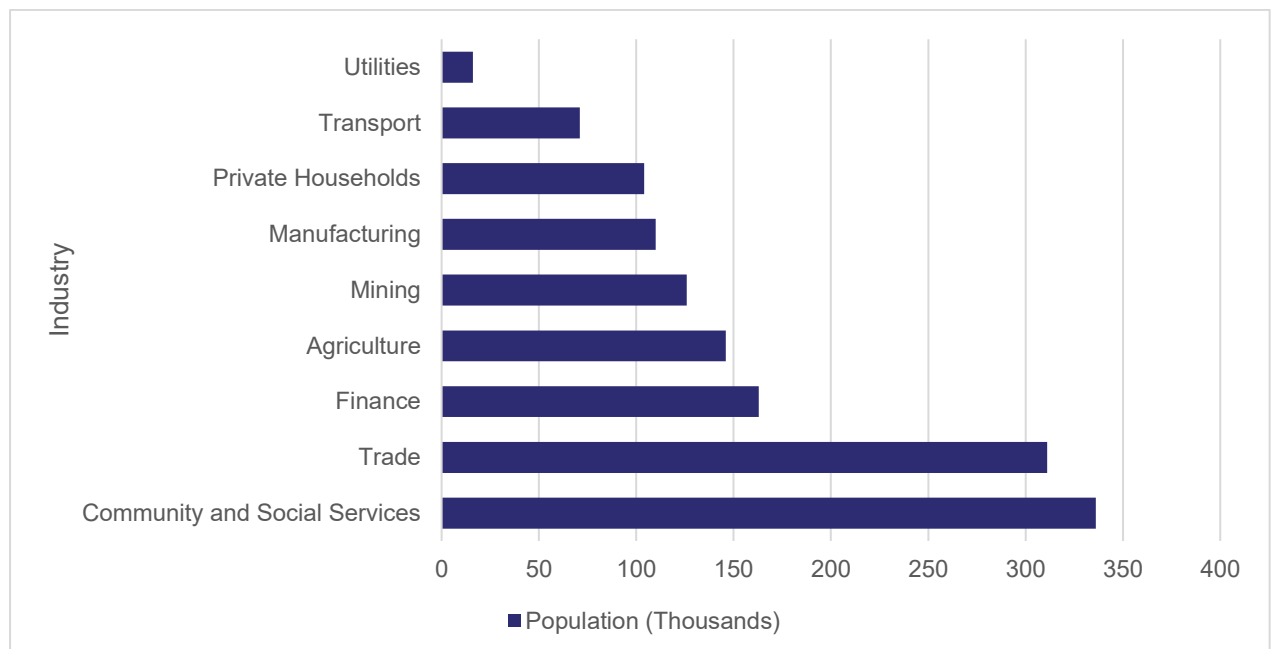


Figure 12: Limpopo Employment Figures by Industry (Thousands) Q2:2025

Source: Statistics South Africa (2025b)

5.1.6. Data Collection Findings

Primary data collected through qualitative engagements and community-level surveys align closely with the broader socio-economic and labour-market challenges documented for Limpopo Province. Stakeholders consistently described an environment marked by limited formal employment opportunities, high youth unemployment and strong dependence on mining, agriculture, public services and informal trading, reflecting the province’s structural labour-market constraints (Statistics South Africa, 2025b). As with earlier literature, participants emphasised that educational attainment is often not translating into sustainable employment due to

gaps in workplace exposure, artisanal certification and practical experience, underscoring the persistent labour-market mismatch identified in Human Capital and LMM Theory (Leoni, 2023).

Spatial inequality emerged strongly across engagements. Opportunities for skills development remain concentrated around Polokwane, Tzaneen, Thohoyandou and Mokopane, while remote communities in districts such as Vhembe, Mopani and Sekhukhune continue to face substantial barriers related to distance, transport costs, limited provider capacity and weak digital connectivity (Department of Higher Education and Training (DHET), 2023a). Participants noted that even where training institutions exist, such as TVET colleges or private technical centres, the proximity gap limits participation for rural youth, women, and displaced mineworkers. These spatial barriers reinforce the systemic skills-supply gaps identified earlier in the study.

Quantitative responses confirmed these patterns, showing that the dominant economic activities in surveyed communities include agriculture, retail, small-scale services and government employment, mirroring provincial trends where mining remains economically significant but does not absorb enough labour to offset high unemployment (MQA, 2025c; Statistics South Africa, 2025b). Mining-affected communities also reported increasing economic uncertainty linked to automation, contracting and restructuring within the platinum, coal, copper and chrome sub-sectors, intensifying the need for reskilling and diversification.

Stakeholders consistently highlighted expanding skills gaps across several priority areas: digital literacy, ICT systems, engineering and artisan trades, occupational health and safety, plant operations, environmental rehabilitation, renewable-energy technologies and small-enterprise development. These findings strongly align with the province's hard-to-fill vacancies in engineering, technicians, electricians, instrumentation specialists, OHS practitioners and supervisory roles (MQA, 2025d). Moreover, community respondents emphasised the need for practical and portable skills in agriculture, construction, plumbing, electrical work, business administration and computer skills, especially in rural areas where livelihood diversification is essential.

A further concern highlighted was the *weak coordination and misalignment* between SETAs, training institutions, employers and community needs. Stakeholders reported inconsistent communication about available programmes, limited workplace placements for learners, and significant administrative bottlenecks in accessing grant funding. Mining companies and training providers also cited funding constraints for equipment, workshop infrastructure, simulators and digital training platforms as major barriers to delivering high-quality, industry-relevant training (MQA, 2025c). Relationships between employers and SETAs, including the MQA, were described as fragmented, with insufficient engagement to ensure that qualifications, curricula and

work-integrated learning (WIL) placements match industry demand. This is further discussed in Section 5.3.

Collectively, these findings reveal a provincial skills ecosystem characterised by *misalignment*, spatial inequality, institutional fragmentation and gaps in training quality and accessibility. Without improved coordination, expanded reskilling pathways, and deliberate investment in community-proximate training infrastructure, Limpopo risks reinforcing existing disparities in employability and economic participation. A more integrated, demand-led approach, linking SETAs, employers, training providers and provincial development priorities, will be critical to strengthening labour-market absorption and supporting inclusive, diversified livelihoods beyond the mining sector.

5.2. Mining and Minerals Sector (MMS) Profile

The mining and mineral sector contributed 6% to the national GDP of South Africa in 2024, with the Limpopo province and the North-West province being the main contributors, each contributing 25% towards this sector (Statistics South Africa, 2025d). This region possesses an extensive and geologically diverse range of mineral resources that are central to both the provincial and national economies.

Geologically, the Limpopo province hosts several major orebodies, including parts of the eastern and western limbs, as well as the entire northern limb of the Bushveld Igneous Complex (BIC), and the Waterberg Coalfield (Limpopo Provincial Government, 2023a). Limpopo also hosts various diamond-bearing kimberlite deposits, as well as other copper, precious stones, gold, limestone and sand deposits (Limpopo Provincial Government, 2023a).

According to the 2025 WSP data received from the MQA, the mining and minerals sector in Limpopo consists of 65 employers, and the list of operating mines as published by the DMPR in 2025. These organisations cover multiple sub-sectors, including:

- Platinum Group Metals (PGM) Mining
- Coal Mining
- Diamond Mining
- Gold Mining
- Other mining
- Services Incidental to Mining
- Jewellery Manufacturing
- Cement, Lime, Aggregates and Sand (CLAS)

Regarding district distribution of active mines, this is as follows:

- Capricorn District Municipality = 34
- Mopani District Municipality = 33
- Sekhukhune District Municipality = 20
- Vhembe District Municipality = 22
- Waterberg District Municipality = 73

5.2.1. Platinum Group Metals (PGMs)

PGMs consist of six noble metals, namely platinum, palladium, rhodium, ruthenium, osmium and iridium - of which platinum, palladium, rhodium and iridium are also considered to be precious metals (Minerals Council of South Africa, 2025a).

The eastern limb of the BIC hosts the largest known reserves of PGMs globally (approximately 80% of global reserves), together with significant quantities of titanium, vanadium, iron, and tin (Viljoen & Schürmann, 1998; Cawthorn, 2015). The Merensky Reef and UG2 Reef are the two predominant reefs, containing thick chromitite seams that represent major global sources of chromium and PGMs. In addition to PGMs and chromium, the complex also consists of gabbro formations throughout, which are suitable for dimension stone extraction. The eastern limb extends through areas such as Mokopane and the Burgersfort/Steelpoort area, which forms part of the key area for platinum and chrome production (Johnson, et al., 2006).

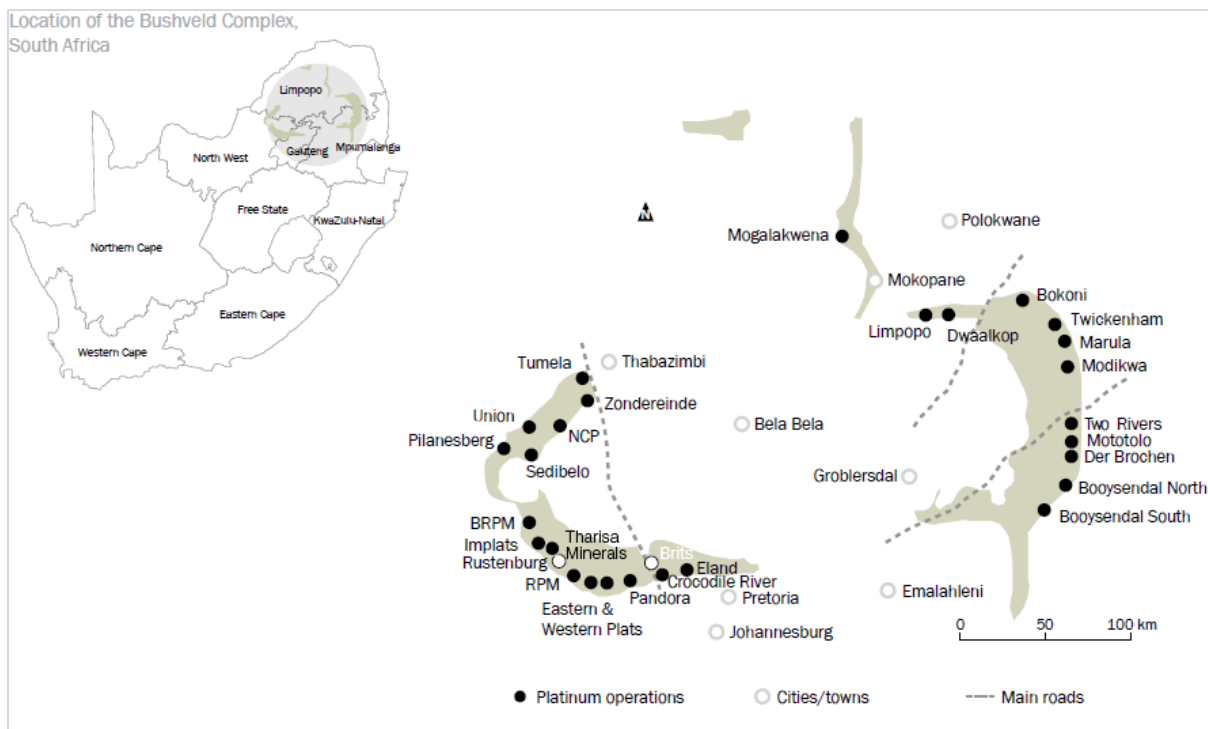


Figure 13: Bushveld Igneous Complex in South Africa

Source: Minerals Council of South Africa (2025a)

Key platinum mining operations in Limpopo include (Minerals Council of South Africa, 2019):

- Mogalakwena Mine (Anglo American Platinum). This is the largest open-pit PGM mine globally, highly mechanised and a model for future operations.
- Zondereinde Mine (Northam Platinum): a long-established underground operation.
- Marula, Modikwa, Twickenham, Two Rivers, Booyensdal, and Der Brochen mines. These are concentrated near Burgersfort, Steelpoort, and Mokopane.
- Other emerging projects, such as Ivanplats (Platreef Project near Mokopane), signal renewed interest in Limpopo's reserves.

Despite South Africa holding over 80% of the world's PGM reserves (and 95% of known platinum reserves), the sector has been undergoing declining prices, rising costs, and weak demand growth. Between 2006 and 2016, the platinum mining industry in South Africa experienced the following (Minerals Council of South Africa, 2019):

- Employment fell from 200 000 to 188 000 people.
- Production dropped from 9.9 million ounces to 8.5 million ounces.
- Profitability collapse - over 60% of operations are now loss-making due to high labour and electricity costs, and stagnant PGM prices.

This decline in the South African platinum industry can be attributed to a combination of factors, including (Minerals Council of South Africa, 2019):

- Decline in global demands - Palladium has replaced platinum in catalytic converters, while the diesel emissions scandal reduced platinum's use in diesel vehicles.
- Increase in recycling - Secondary (recycled) supply rose from 14% (2006) to 34% (2016), reducing demand for newly mined metal.
- Weak Chinese jewellery demands due to slower economic growth.
- Increasing production costs, especially labour and energy, have reduced margins significantly.
- Uncertainty in investment and regulation, including slow transformation and policy instability.

Considering the significant portion of the platinum reserves in Limpopo, this province is the core of the PGM production in South Africa. As such, Limpopo faces significant socio-economic pressure due to the decline over recent years, including employment fluctuations and instability, as well as infrastructure and community strain in mining areas resulting from fluctuating mining activity (Minerals Council of South Africa, 2019).

In a publication titled "National Platinum Strategy" by the Minerals Council of South Africa, several strategies have been put forth aimed at reviving the short-term platinum industry viability and limiting job losses, stimulating the global demand for PGMs and related minerals and positioning these minerals as strategic resources for future technological economies and the transition towards clean energy (Minerals Council of South Africa, 2019). These strategies present new opportunities for development and growth in clean energy projects and initiatives within the Limpopo province.

5.2.2. Coal

In the South African context, coal is central to the energy sector and is regarded as the most significant commodity in terms of production volumes mined, with an output of 236 million tonnes produced in 2024 (Minerals Council of South Africa, 2025a). Approximately 100 million tonnes (42%) of the coal produced in 2024 were utilised domestically by Eskom for electricity generation, and 71 million tonnes (30%) were exported to meet international demand (Minerals Council of South Africa, 2025a).

The Waterberg Coalfield, located west of Lephalale, is estimated to contain nearly half of South Africa's economically recoverable coal reserves, rendering it vital for long-term national energy security (Makgato & Chirwa, 2017). The coal in this area is primarily of bituminous grade, suitable for thermal power generation and synfuel

production, and supplies coal to Eskom’s Medupi Power Station and future coal-to-liquids projects (Makgato & Chirwa, 2017).

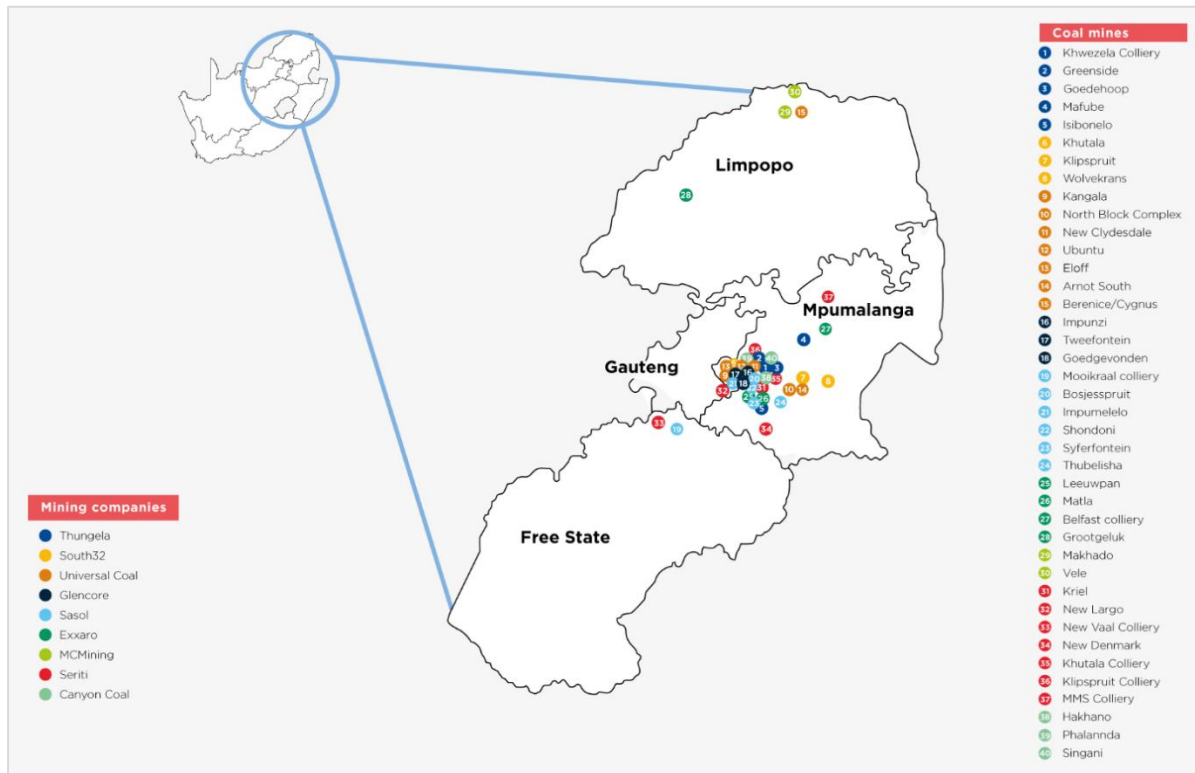


Figure 14: Coal Mining in South Africa

Source: Minerals Council of South Africa (2025)

Coal mining in Limpopo is not a major contributor to the province’s mining output compared to metal ores, only contributing approximately 2% to 4% of the provincial Gross Value Added (GVA) (Trade and Industrial Policy Strategies (TIPS), 2024a). Currently, there are four active coal mining operations in Limpopo province – the largest being Exxaro’s Grootegeluk mine, producing approximately 26 million tonnes of final coal products per year and employing a total of 3 200 people on the mine (Exxaro Resources, 2025).

Considering the overall coal mining industry in South Africa, employment numbers have been increasing over the past decade (since 2016), with a brief dip between 2020 and 2022, despite the overall production tonnes decreasing (Minerals Council of South Africa, 2025a). The decline in coal production can be attributed to South Africa’s Just Energy Transition Investment Plan (JET-IP), which involves Eskom’s integration of solar, wind, battery storage and gas-to-power technologies into its existing coal-fired power generation sites. It is expected that by 2030, Eskom will aim to consume 30 million tonnes less coal due to the integration of alternative energy solution technologies and the overall decrease in electricity demands in South Africa (Minerals Council of South Africa, 2025a). This expected decrease in coal demand does not necessarily imply reduced job availability in the sector but could alternatively indicate

an increased need for new and/or transferable skills development between coal and alternative power generation processes.

5.2.3. Diamonds

The South African diamond sector has shown a significant decline in production since 2022, dropping from approximately 10 million carats in 2022 to 5.8 million carats in 2024 (Minerals Council of South Africa, 2025b). This is consistent with global trends, driven by current market pressures and decreased demand, primarily resulting from the influx of cheaper synthetic alternatives.



Figure 15: Diamond mining operations in South Africa

Source: Minerals Council of South Africa (2025b)

In the Vhembe District, diamond-bearing kimberlite pipes, notably those mined at the Venetia Mine, constitute an additional mineral asset. Venetia is the largest diamond mine in South Africa and contributes significantly to the national diamond output and employment in the northern region (De Beers Group, 2023). Currently transitioning to underground mining, Venetia Mine contributes approximately 35% to the South African diamond production, with 2.2 million carats recovered in 2024 (De Beers Group, 2025). The first production blast for the underground operations was fired in mid-2023, and an expected steady-state production output of approximately 4 million carats per

annum will be achieved within the next couple of years (Minerals Council of South Africa, 2025a).

Although a global decline in the diamond market is evident over the last decade, the US\$2.3 million investment in the Venetia underground expansion project demonstrates that the demand for natural diamonds remains significant (De Beers Group, 2025).

Employment numbers have also declined significantly since 2016, yet the diamond sector in South Africa still accounts for 14 247 direct employees in 2024 (Minerals Council of South Africa, 2025a), with Venetia Mine in Limpopo currently employing over 2,500 people (De Beers Group, 2025).

5.2.4. Copper

Copper is one of the earliest metals mined in South Africa, with key operations being Palabora Copper Mine (Palabora Mining Company - PMC) in the Limpopo province and Okiep Copper Mine in the Northern Cape (Jansen van Vuuren, 2024).

The Phalaborwa copper deposit is situated within the Phalaborwa Igneous Complex in the Ba-Phalaborwa area in the Mopani District. This deposit is internationally recognised as a carbonatite-hosted copper system, a rare geological environment associated with alkaline and carbonatite intrusions enriched in copper, phosphate, magnetite, vermiculite, zircon, and rare earth elements (Eriksson, 1989; Groves, et al., 2018). The primary copper-bearing minerals include chalcopyrite, bornite, and chalcocite, often in association with apatite and magnetite mineralisation.

PMC, established in 1956, is one of South Africa's largest copper mines and has also produced significant by-products such as phosphate rock, vermiculite, and uranium. The deposit's economic and geological characteristics make it a key example of integrated resource utilisation within South Africa's mining sector (Palabora Mining Company, 2022). PMC currently employs over 5 000 people, including contractors, and continuously strives to empower youth and women through its employment strategies (Forbes Africa, 2023).

Some of the current challenges faced by the copper mining sector in South Africa include declining ore grades and increasing costs, as well as environmental impacts, alongside concerns over land degradation, water pollution, and carbon emissions (Jansen van Vuuren, 2024). Despite this, the sector maintains a strong potential considering that technological advancements can improve efficiency and sustainability, renewable energy can stabilise power supply and reduce emissions, and continued exploration can help limit the rate of resource depletion. Increasing global demand for copper in renewable energy and electric vehicle production ensures that the metal is essential to the green economy efforts, while supportive government

policies and effective partnerships remain key to future growth (Jansen van Vuuren, 2024).

5.2.5. Data Collection Findings

Findings emerging from stakeholder engagements and survey responses further deepen the literature-based understanding of the Limpopo MMS as a mature, stable industry with limited prospects for large-scale employment growth. Across key mining districts such as Waterberg, Sekhukhune and Mopani, stakeholders described the sector's labour demand as largely replacement-based, driven by retirements, internal mobility and scarce-skill vacancies rather than expansion. This trend reflects LMM dynamics, where established sectors continue to require specialised skills to maintain operations but generate minimal new employment opportunities.

From a Human Capital Theory perspective, the evidence shows that conventional mining-related training pipelines, historically perceived as direct pathways into employment, no longer offer consistent returns for young people in the province. Stakeholders repeatedly highlighted gaps between theoretical qualifications and workplace-readiness, particularly regarding practical exposure, trade certification and access to learnerships. These challenges place considerable strain on the province's universities, TVET colleges, private training institutions and MQA-accredited providers to meet industry expectations. At a systems level, stakeholders also pointed to fragmented coordination between mining houses, SETAs and training institutions, which often results in training that is misaligned with actual operational needs or provincial development priorities.

Stakeholders recognised emerging opportunities within upstream and downstream mining value-chain activities, such as engineering services, mineral processing, environmental rehabilitation, renewable energy integration, mine closure work and infrastructure maintenance, but noted that these areas remain underdeveloped and geographically uneven, offering limited absorption capacity at present. Rural communities remain disadvantaged due to the distance between training providers and settlements, limited transport options and inconsistent access to digital learning.

Overall, the alignment between literature research and stakeholder engagements suggests that Limpopo's MMS can no longer be relied upon as the primary driver of widespread employment. Instead, the sector requires deliberately crafted transition strategies that balance ongoing operational skills needs with expanded reskilling and cross-sector mobility opportunities, especially into agriculture, green energy, manufacturing, services and environmental management. Strengthening the alignment between training provision, sectoral transitions and local economic development frameworks will be essential for addressing skills shortages, improving

employability and supporting sustainable livelihoods in the context of structural economic change.

5.3. Skills Demand, Supply and Gaps

Skills are defined as “the ability to perform a task adeptly, using experience and professional knowledge” (Department of Higher Education (DHET), 2021b) and competence is “a combination of knowledge, skills and attitudes” (EU Science Hub, n.d.).

Sector Skills Plans (SSP) generally have a national scope and do not focus specifically on provincial needs. In contrast, WSP include provincial data within their submissions. The WSP data has sometimes enabled a provincial focus. However, for certain data categories, employers operating in multiple provinces struggle to specify data for individual provinces, often reporting data for only one province or the incorrect province.

5.3.1. Provincial Data and Findings (WSP Analysis)

Within the Limpopo province, there are 8 of the 9 sub-sectors that are represented. Figure 16 shows that the majority of employees are employed within PGM mining (43 464), and CLAS has the lowest number of employees in the province, with 366.

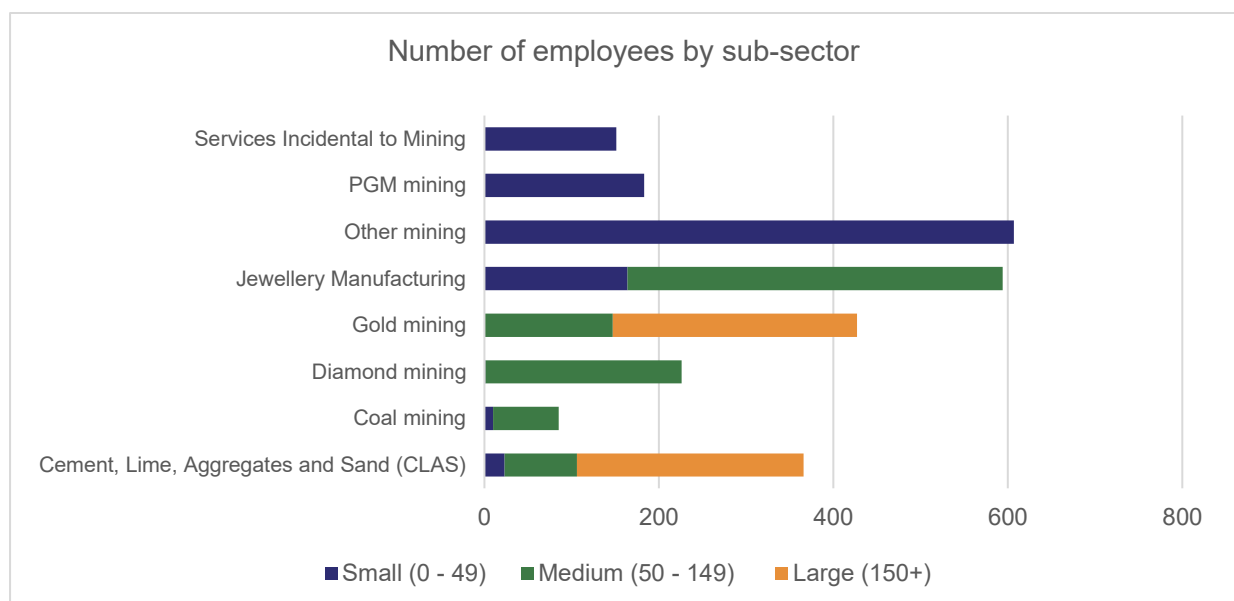


Figure 16: Number of employees by sub-sector

Source: MQA 2025 WSP Data (Based on biographical data by province)

Considering the highest qualifications within the province across all sub-sectors, it is shown that 44% of employees have achieved Grade 12 or an equivalent level of education. A significant decrease is noted, considering that the next most common qualification achieved is a level of Grade 11 or an equivalent level (10%). Based on

the data available, only 4% have an artisanal trade certificate, and 9% were indicated as 'Do not know'.

Figure 17 indicates that refresher training (31%) was the most common development activity undertaken, followed by the next highest being induction training (28%) and closely followed by short courses (25%).

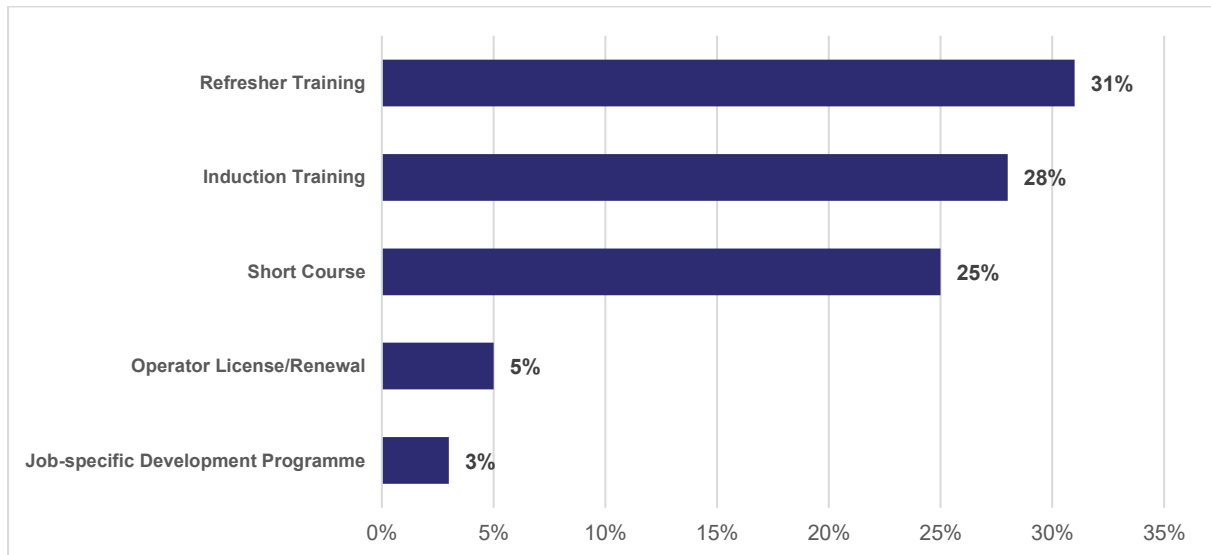


Figure 17: Top 5 development activities undertaken

Source: MQA 2025 WSP Data (Based on data indicated by province)

The planned training interventions, as given in Table 10, are mostly focused on Refresher Training (32 535) and Induction Training (26 272). The majority of the training planned is within the 'Other' mining sub-sector.

Table 10: Planned training

Intervention Type	CLAS	Coal mining	Diamond mining	Gold mining	Jewellery Manufacturing	Other mining	PGM mining	Services Incidental to Mining	Grand Total
Adult Education and Training	1					426	98		525
Bachelor's Degree		14				8	4		26
Bursary			5			86	51		142
Certificate		51		53	18	1 099	774	105	2 100
Ex-Leave Training				160		2 661	3 901		6 722
Further Diploma		6				3	4		13
Honours Degree						2	1		3
Induction Training		11 364		3	17	3 849	11 039		26 272
Internship		2	12				23		37
Job Specific Development Programme		7	267		5	1 084	360	3	1 726
Learnership		4	18		180	334	229	5	770
Master's Degree		4				6	2		12
MQA Qualification						8			8
National Certificate						9	13		22
National Diploma		23				11	4		38
National Higher Certificate							4		4
National Higher Diploma		7					3		10
NCV level 4 placements					50			50	100

Intervention Type	CLAS	Coal mining	Diamond mining	Gold mining	Jewellery Manufacturing	Other mining	PGM mining	Services Incidental to Mining	Grand Total
Operator License/Renewal		675	67	35		2 424	3 668	47	6 916
Post-Doctoral Degree		1							1
Post Graduate Diploma						2	4		6
Recognition of Prior Learning					30		3		33
Refresher Training	13	1 177	2 002	513		25 508	3 322		32 535
Short Course		2 710	610		9	2 696	3 001	36	9 062
Skills Programme	8		78		106	183	875	753	2 003
Trade					364	62	4	20	450
Work Placement						30			30
Grand Total	22	16 045	3 059	764	779	40 491	27 387	1 019	89 566

Source: MQA 2025 WSP Data (Based on data indicated by organisational province – may not fully represent the province)

The hard-to-fill vacancies (HTFV) are summarised in Table 11 included:

Table 11: Hard-To-Fill Vacancies with associated Occupational Framework for Occupations (OFO) codes

OFO Code	Specialisation/Occupation
2021-111207	Superintendent-general
2021-121201	Human Resource Manager
2021-121202	Human Resources Development Manager
2021-121202	Education, Training, and Skills Development Manager
2021-121206	Safety, Health and Environmental (SHE) Manager
2021-121905	Programme or Project Manager
2021-132104	Engineering Manager
2021-132104	Section Engineer
2021-132104	Engineering Maintenance Manager
2021-132104	Mining Engineering Manager
2021-132107	Reliability Engineer
2021-132201	Mine Manager
2021-132201	General Manager Mining
2021-132201	Shaft Development Manager Mining
2021-132201	Production Manager
2021-132202	Chief Surveyor (Mining)
2021-132203	Rock Engineering Manager
2021-132301	Building and Construction Manager
2021-132301	Construction Project Manager
2021-132402	Logistics Manager
2021-133101	ICT / IT Manager
2021-133103	Data Management Manager
2021-143104	Arts Centre Manager
2021-211401	Geologist
2021-213302	Environmental Officer
2021-214103	Production Engineer
2021-214201	Civil Engineer
2021-214201	Structural Engineer
2021-214401	Mechanical Engineer (Mines)
2021-214401	Maintenance Management Engineer
2021-214401	Mechanical Engineer
2021-214402	Maintenance Technologist
2021-214601	Rock Engineer
2021-214601	Mine Ventilation Engineer
2021-214601	Mining Engineer
2021-214605	Metallurgist
2021-215101	Electrical Engineer (Mines)
2021-215101	Electrical Engineer

OFO Code	Specialisation/Occupation
2021-215201	Instrumentation Engineer
2021-215202	Instrumentation Technologist
2021-216502	Mine Surveyor
2021-226302	Occupational Hygienist
2021-226302	Safety Coordinator
2021-226302	Safety, Health, Environment and Quality (SHE&Q) Practitioner
2021-226302	Health and Safety Officer / Coordinator / Professional
2021-226302	Risk and Safety Manager
2021-226302	Chief Safety Officer Mining
2021-231101	Assessment Advisor and/or Internal Moderator
2021-241107	Financial Accountant
2021-241107	Company Accountant
2021-242101	Business Coach
2021-242208	Organisational Risk Officer
2021-242401	Training Officer
2021-242401	Training and Development Practitioner
2021-242402	Occupational Instructor
2021-242402	On-the-job Trainer
2021-242402	Business Skills Trainer
2021-242403	Assessment Practitioner
2021-242403	Assessor
2021-251201	Information Architect Software
2021-251302	Website Developer
2021-252101	Database Analyst
2021-252201	Systems Manager
2021-261901	Facilitator
2021-311101	Chemical Laboratory Technician / Analyst
2021-311301	Electrical Instrument Technician
2021-311401	Instrumentation Technician
2021-311601	Energy Technician
2021-311701	Strata Control Observer
2021-311701	Strata Control Practitioner
2021-311701	Mining Surveyor
2021-311701	Surface Mining Strata Control Practitioner
2021-311904	Master Goldsmith
2021-312101	Mine Overseer (Production)
2021-312101	Mining Production Supervisor
2021-312101	Shift Supervisor (Mining)
2021-312101	Shift Foreman/ Boss (Mining)
2021-312101	Pit Foreman
2021-312101	Mine superintendent

OFO Code	Specialisation/Occupation
2021-312102	Hard Rock Miner
2021-312102	Shaft Timberman
2021-312102	Miner
2021-312103	Engineering Foreman
2021-312103	Planned Maintenance Foreman
2021-312103	Engineering Supervisor
2021-312103	General Engineering Supervisor (GES)
2021-312202	Engineering Planner
2021-313109	Solar Photovoltaic Service Technician
2021-313203	Water Works Management Practitioner
2021-325705	Mine Risk Control Officer
2021-325705	Mine Safety Officer
2021-325707	Mine Health and Safety Inspector
2021-325708	Magazine Master
2021-333905	Supply Chain Practitioner
2021-334302	Personal Assistant
2021-341103	Legal Assistant
2021-351301	Computer Network Technician
2021-411101	Administrative Assistant
2021-431301	Payroll Coordinator
2021-432105	Lamp room Supervisor
2021-441601	Human Resources Clerk
2021-441903	Project Controller
2021-524501	Petroleum Transfer Technician
2021-641201	Bricklayer
2021-641201	Bricklayer and Plasterer
2021-641502	Formwork Carpenter
2021-641902	Scaffolder
2021-641902	Scaffolding Inspector
2021-642605	Water Reticulation Practitioner
2021-651302	Boilermaker
2021-651403	Steel Fixer
2021-651501	Rigger Ropesman
2021-652301	Fitter-machinist
2021-652302	Fitter and Turner
2021-653109	Automotive Engine Mechanic
2021-653303	Fitter (including Machining)
2021-653306	Diesel Fitter-mechanic
2021-653306	Diesel Mechanic
2021-653307	Earthmoving Equipment Mechanic
2021-653307	Heavy Equipment Mechanic

OFO Code	Specialisation/Occupation
2021-661301	Designer Goldsmith Jeweller
2021-661301	Goldsmith
2021-661301	Handmade Jewellery Chain maker
2021-661302	Jewellery Setter
2021-661302	Diamond and Gemstone Setter
2021-661801	Handicraft Spinner
2021-671101	Electrician (General)
2021-671101	Electrician
2021-671101	Winder Electrical Technician
2021-671202	Millwright
2021-671202	Millwright (Electro-mechanic)
2021-671208	Auto Electrician
2021-671302	Cable Jointer
2021-671302	Electric Cable Jointer
2021-672105	Instrument Mechanician
2021-672105	Instrument Mechanic
2021-672105	Instrument Mechanician (Industrial Instrumentation and Process Control)
2021-684201	Surface Blaster
2021-684201	Underground Hardrock Blaster
2021-711101	Roof Bolter (Mining)
2021-711201	Tailings Plant Operator
2021-711202	Jewellery Die Stamper
2021-711203	Diamond Cutter and Polisher
2021-711203	Diamond Cutter
2021-711301	Drill Rig Operator
2021-711301	Scaler Operator
2021-711301	Jumbo Operator
2021-733208	Mobile Mining Equipment Operator
2021-733208	Roof Bolter Operator
2021-734203	Bulldozer Operator
2021-734204	Excavator Operator
2021-734204	Hydraulic Rock Breaker Operator
2021-734301	Winding Engine Driver
2021-811201	Commercial Cleaner
2021-831101	Mining Worker
2021-831310	Surveyor's Assistant
2021-832901	Boilermaker Aide
2021-832910	Wheel Alignment Attendant
2021-862918	Artisan Aide Electrical

Source: MQA 2025 WSP Data (Based on data indicated as Limpopo province)

The top-up skills identified (*based on data indicated by organisational province – which may not fully represent the province*) were mostly technical (job-specific) skills and leadership skills. The technical skills applied to the following specialisations (with OFO codes provided for reference):

- Auto Electrician (2021-671208)
- Blasting Assistant (2021-684201)
- Boilermaker (2021-651302)
- Conveyor Belt Operator (Mining) (2021-711201)
- Diesel Fitter-mechanic (2021-653306)
- Drill Rig Operator (2021-711301)
- Electrician (2021-671101)
- Fitter and Turner (2021-652302)
- Health and Safety Officer / Coordinator / Professional (2021-226302)
- Instrument Mechanician (Industrial Instrumentation & Process Control) (2021-672105)
- Load-haul-dump (LHD) Operator (2021-734206)
- Maintenance Management Engineer (2021-214401)
- Maintenance Planner (2021-312202)
- Mechanic Aide (2021-862919)
- Medium Voltage Switchgear Electrician (2021-671101)
- Milling Plant Operator (2021-711201)
- Mining Production Assistant (2021-831101)
- Moderators (2021-235102)
- Plant Monitor (2021-711201)
- Rock Drill Operator (2021-711302)
- Rock Engineer (2021-214601)
- Roof Bolter Operator (2021-733208)
- Surveyor (2021-216502)
- Trackless Mobile Machinery (TMM) Operator (2021-733208)

Table 12 shows that a variety of development initiatives were completed within communities, with the majority being induction training (2 161). Most of the training undertaken was targeted at youth.

Table 12: Community training programmes undertaken

Intervention Type	Other	People with Disabilities	Retrenched Workers	School-based Learners	Youth	Grand Total
Adult Education and Training	227				775	1 002
Bachelor's degree					16	16
Bursary				22	442	464
Certificate	32	20		80	241	373
Ex-Leave Training					133	133
Further Diploma					2	2

Intervention Type	Other	People with Disabilities	Retrenched Workers	School-based Learners	Youth	Grand Total
Honours Degree					1	1
Induction Training					2 161	2 161
Internship					391	391
Job Specific Development Programme					357	357
Learnership					286	286
MQA Qualification					50	50
NCV level 4 placements					8	8
Operator License/Renewal	48				286	334
Post Graduate Diploma					19	19
Refresher Training	135			100	401	636
Short Course	179				1 230	1 409
Skills Programme	83	1			585	669
Trade	2	30	50		164	246
Work Placement					155	155
Grand Total	706	51	50	202	7 703	8 712

Source: MQA 2025 WSP Data (Based on data indicated by organisational province – may not fully represent the province)

The planned training interventions for communities, as shown in Table 13, will also largely be focused on youth, with a focus on induction training (3 789), followed by short courses (2 512).

Table 13: Community training programmes planned

Intervention Type	Other	People with Disabilities	Retrenched Workers	School-based Learners	Youth	Grand Total
Adult Education and Training	73				532	605
Bachelor's degree					16	16
Bursary				6	358	364
Certificate	218	21		27	146	412
Ex-Leave Training					130	130
Further Diploma					2	2
Honours Degree					6	6
Induction Training					3 789	3 789
Internship	2				558	560
Learnership	3	1			673	677
MQA Qualification					94	94
National Certificate					5	5
Operator License/Renewal	8				432	440
Refresher Training	210			85	1 097	1 392

Intervention Type	Other	People with Disabilities	Retrenched Workers	School-based Learners	Youth	Grand Total
Short Course	885				1 627	2 512
Skills Programme	74			53	529	656
Trade		30	65		213	308
Work Placement					524	524
Grand Total	1 473	52	65	171	10 731	12 498

Source: MQA 2025 WSP Data (Based on data indicated by organisational province – may not fully represent the province)

Contractors who were trained were primarily trained through induction training. This is also the biggest focus for future training. Another intervention type that was of significance was operator license/renewal, as shown in Figure 18. This is to be expected, due to the legal requirements of induction and license/renewals being required for site access. There is a significant gap between the number of people trained and the planned training numbers.

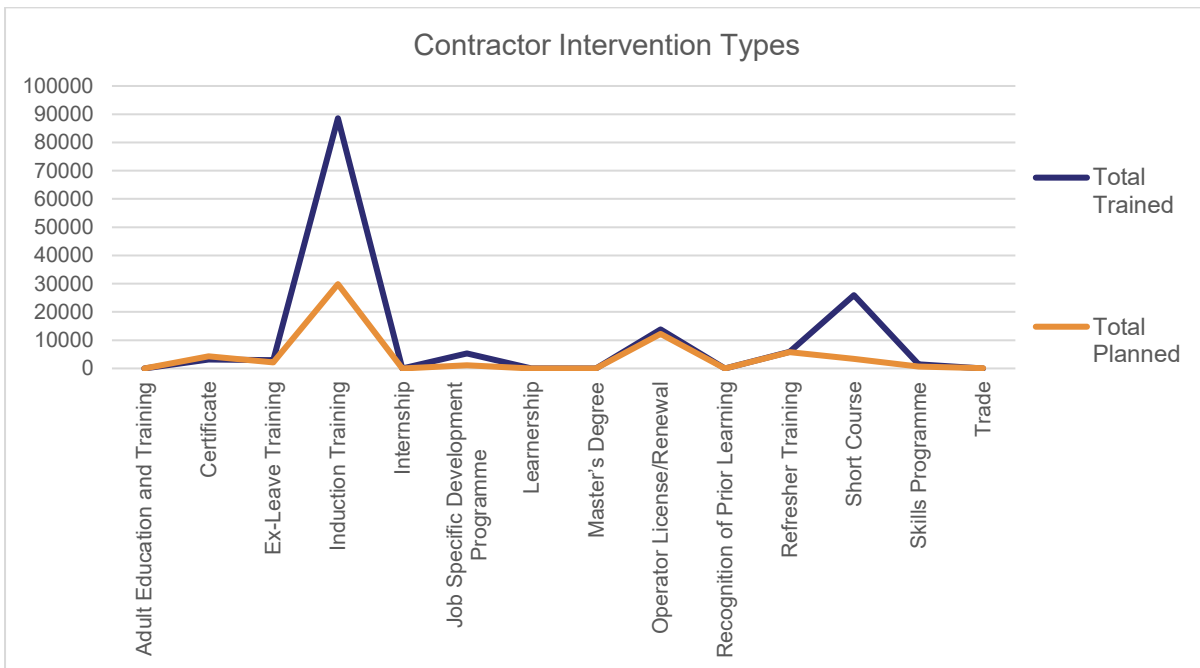


Figure 18: Contractor intervention types

Source: MQA 2025 WSP Data (Based on data indicated by organisational province – may not fully represent the province)

A wide range of skills development initiatives have been implemented in the Limpopo Province through funding from the National Skills Fund (NSF), multiple SETAs and partnerships with mining companies and other private-sector stakeholders. These initiatives focus on learnerships, apprenticeships, internships, WIL, community-based training and public employment programmes, with particular emphasis on youth, unemployed individuals and vulnerable groups, especially in rural and mining-affected communities (Department of Higher Education and Training (DHET), 2022a; MQA, 2025a). Such interventions are critical

in a province characterised by high unemployment, spatial inequality and limited access to post-school education and training.

NSF- and SETA-funded programmes in Limpopo are concentrated in sectors central to the provincial economy, including mining and minerals, agriculture, construction, engineering, public services and the broader services sector. Delivery occurs through TVET colleges, accredited training providers and employer-led workplace learning platforms across both urban and predominantly rural districts (Department of Higher Education and Training (DHET), 2020a; Department of Higher Education and Training (DHET), 2023a). In parallel, national initiatives such as the Expanded Public Works Programme (EPWP) continue to provide short-term employment and work experience, supporting basic skills exposure and employability development for unemployed youth and adults (Statistics South Africa, 2025a).

Within the mining and minerals sector, Limpopo benefits from the Mining Qualifications Authority's continued investment in artisan development, learnerships, internships, workplace experience, occupational health and safety training, foundational learning and community-based programmes, reflecting the province's importance to South Africa's mining economy (MQA, 2025a). These initiatives target both employed and unemployed beneficiaries, including mine communities and historically disadvantaged groups. At the same time, Limpopo's emerging role in the energy transition, particularly in the Waterberg region, is introducing new skills requirements in renewable energy, environmental management and digital systems, many of which overlap with traditional mining-related technical skills (Department of Science and Innovation (DSI), 2022; Department of Higher Education and Training (DHET), 2022b; Energy and Water Sector Education and Training Authority (EWSETA), 2023).

Collectively, these initiatives represent a strong supply-side response to skills development. However, evidence continues to highlight weaknesses in alignment between training provision and labour-market absorption. Despite the scale of interventions, Limpopo experiences persistently high unemployment, especially among youth, alongside ongoing shortages in technical, engineering, supervisory and safety-related occupations, indicating continued labour-market mismatches and weak progression pathways from training into sustainable employment (Statistics South Africa, 2025b; Minerals Council of South Africa, 2025a; MQA, 2025a).

Many skills shortages in Limpopo cut across multiple sectors, with recurring demand for transferable competencies such as management, leadership, communication, digital literacy, project management and occupational health and safety, alongside core mining and engineering trades (MQA, 2025b). From a systems perspective, these cross-cutting skills support labour mobility across mining, agriculture, manufacturing, services and emerging green-economy sectors, which is particularly important for mining-dependent communities facing restructuring and technological change (Leoni, 2023; Almendarez, 2011; Auerbach & Green, 2024).

Considering these findings reinforces the importance of a coordinated and demand-responsive skills ecosystem in Limpopo, one that reduces skills mismatches, strengthens learner progression, and improves alignment between training provision and labour-market needs (Department of Higher Education and Training (DHET), 2022a; Statistics South Africa, 2025a). Achieving this requires not only effective programme design but also a strong and accessible network of education and training institutions capable of delivering relevant, high-quality learning opportunities. Within this context, it is essential to examine the post-school education and training landscape in Limpopo, including the range, distribution and accreditation levels of the institutions that strengthen skills development across the province.

Within the Limpopo province, there are several education and training institutions that offer a range of programs and services, varying in terms of their level of accreditation.

- 2 providers that are part of the MQA Programme Approval (2025 Accredited Training Providers and Programme Approvals from the MQA).
- 33 MQA accredited providers (2025 Accredited Training Providers and Programme Approvals from the MQA).
- 7 Technical and Vocational Education and Training (TVET) Colleges (Department of Higher Education and Training (DHET), 2025c).
- 2 Universities (excluding UNISA – Polokwane Regional Service Centre and Tshwane University of Technology – Polokwane Campus) (Department of Higher Education and Training (DHET), 2025b).
- 18 Private Colleges (Department of Higher Education and Training (DHET), 2025a).

The provided list underscores the dual nature of the post-school education and training landscape in Limpopo, exhibiting both diversity and limitations. While education is provided across universities, TVET colleges, private institutions, and sector-specific accredited providers, the limited number of institutions (i.e., primarily two universities and seven TVET colleges) restricts access (primarily due to geographical location) and capacity. This situation raises concerns regarding the province's capacity to generate a sufficiently skilled workforce locally, particularly in sectors such as mining, where there are only a handful of MQA-accredited providers, and manufacturing. Consequently, to bolster workforce readiness, it may be necessary to augment institutional capacity, enhance the quality and relevance of programmes, and strengthen partnerships between training providers, the industry, and the government.

The particular technical programmes relevant to mining on offer from these institutions are illustrated in Table 14.

Table 14: Education and training providers in Limpopo

Institution Type	Name of Institution	District Municipality	Key Campuses/Notes	Qualification Types & NQF Levels
University	University of Limpopo	Capricorn	Turfloop Campus (near Polokwane)	Bachelor's (NQF Level 7), Honours/Postgrad (NQF 8-10) - e.g., the admissions page refers to NQF 8 for Honours, etc. (University of Limpopo, 2025).
University	University of Venda	Vhembe	Thohoyandou campus	Full degree programmes (Bachelor's, Honours, Masters) at standard university NQF levels
Open / Distance University	UNISA (via Polokwane Regional Service Centre)	Capricorn (province-wide)	Polokwane regional centre	Distance/online Higher Certificates, Diplomas, Bachelor's, Honours, Masters - NQF 5 to NQF 10
TVET College	Capricorn TVET College	Capricorn	Polokwane (Dort and College St) (Limpopo Provincial Government, 2025a)	NC(V) Level 2-4, NATED N1-N6, occupational programmes - vocational/skills training nationally accredited (Capricorn TVET College, 2025).
TVET College	Letaba TVET College	Mopani	Tzaneen (Claude Wheatley St) (Limpopo Provincial Government, 2025a)	NC(V) and NATED: Engineering, Business, Hospitality, ICT - vocational/skills programmes
TVET College	Mopani Southeast TVET College	Mopani	Phalaborwa Campus and Sir Val Duncan (Namakgale) (Mopani South East TVET College, 2025)	N1-N6, NC(V) in Engineering, Business, Process Plant, etc. - ISO 9001 certified.
TVET College	Sekhukhune TVET College	Sekhukhune	Motetema, Groblersdal area (Department of Higher Education and Training (DHET), 2025c)	NC(V) and NATED, artisan or trade-oriented programmes (mechanical, building, business)
TVET College	Vhembe TVET College	Vhembe	Sibasa Unit A, Mashamba, Musina campuses (Edu-Spaces, 2025)	Vocational programmes: Engineering, Business, ICT, Agriculture - skills and trades
TVET College	Waterberg TVET College	Waterberg	Mokopane (36 Hooge St) (Edu-Spaces, 2025)	Vocational and skills programmes, artisan trades, business and tourism-oriented

Institution Type	Name of Institution	District Municipality	Key Campuses/Notes	Qualification Types & NQF Levels
TVET College	Lephalale TVET College	Waterberg	Onverwacht, Lephalale (Nelson Mandela and Ramathodi St) (Edu-Spaces, 2025)	Vocational or trade programmes in the mining and energy region: welding, fitting, electrical, and business
CET / Adult Education	Limpopo Community Education & Training College	Province-wide	Community learning centres (various) (Limpopo Provincial Government, 2025a)	GETC: AET Level 4 (NQF Level 1) and short skills programmes for adult learners.
Industry Training Centre	Palabora Foundation Training Centre	Mopani	Phalaborwa area (mining value-chain)	Learnerships/apprenticeships: electrical, fitting, instrumentation, welding - aligned to SETA artisan/trade levels
Private technical college	Limpopo Academy for Artisans Training (LAFAT)	Capricorn (Polokwane)	Not Applicable	Trade-focused training and N1-N2 subjects: Electrician, Millwright, Diesel Mechanic, Boilermaking, Welding; pathways toward artisan trade testing (Limpopo Academy for Artisans Training (LAFAT), n.d.).
Industry training centre or NGO	Palabora Foundation - Skills Development	Mopani (Phalaborwa)	Not Applicable	Employer- and community-oriented skills programmes aligned to mining; practical training and placements; NSF-accredited provider (Palabora Foundation, 2017).
Private college	ROSTEC Technical College - Polokwane Campus	Capricorn (Polokwane)	Not Applicable	NATED Engineering Studies N1-N6; NC(V) Engineering and Related Design L2-L4; selected short courses (Rostec College, 2023).
Private college	Jeppe College - Polokwane	Capricorn (Polokwane)	Not Applicable	NATED Engineering Studies N1-N6 (Electrical/Mechanical/Civil); IT Systems Support (NQF 5); other NATED technical programmes (Quality Council for Trades and Occupations, 2017).
Private college (ICT)	CTU Training Solutions - Polokwane	Capricorn (Polokwane)	Not Applicable	ICT diplomas and vendor-aligned programmes (e.g., CompTIA/Cisco/Microsoft), project management and technical skills (Services SETA, 2024).
Private college (ICT)	Richfield - Polokwane	Capricorn (Polokwane)	Not Applicable	Higher Certificates and Diplomas in IT/Computer Science; selected short skills programmes (Department of Higher Education and Training (DHET), 2020a).

Institution Type	Name of Institution	District Municipality	Key Campuses/Notes	Qualification Types & NQF Levels
Private college	Polokwane Technology Institute	Capricorn (Polokwane)	Not Applicable	SETA-accredited skills (e.g., End-User Computing/ICT) and related technical training (Polokwane Technology Institute, 2024).
Private skills provider	Spencer Training Academy - Polokwane	Capricorn (Polokwane)	Not Applicable	Boilermaker course (lists Qualification 58720, NQF 3) and welding courses (Spencer Training Centre, n.d.).

Many providers offer administrative courses, including general management, human resources and administration.

Key observations from this list of training providers are:

- Capricorn and Vhembe Districts show a strong urban concentration of post-school education and training institutions, including both public universities, UNISA's regional centre, several TVET colleges and the majority of private and specialised providers. This centralisation improves access for urban learners but reinforces spatial inequalities.
- In contrast, Waterberg, Mopani and Sekhukhune have far fewer training institutions despite being major mining, agricultural and energy regions. Although each district hosts at least one TVET college and selected industry training centres, rural municipalities remain underserved, limiting access to technical and artisan skills.
- Rural areas across these districts face persistent equity gaps, as learners often travel long distances to Polokwane or Thohoyandou to access higher-level programmes. These barriers weaken local human capital development and restrict labour-market readiness, particularly in mining-dependent communities.
- The concentration of private and specialised providers in Polokwane further amplifies urban–rural disparities, limiting opportunities for residents in remote areas to access ICT, engineering and SETA-accredited occupational programmes. This imbalance constrains Limpopo's ability to develop a well-distributed, locally responsive skills pipeline.

A key point is that the only SETA included in the list above is the MQA, as this study is focused on the MMS. Other SETAs that may play a key role in the Limpopo due to the provincial impact of the industries they serve include AgriSETA, CHIETA, merSETA, Services SETA, CATHSSETA, FASSET, W&RSETA, LGSETA, PSETA and EWSETA.

In line with Human Capital Theory, education and training constitute critical investments that shape individual productivity, employability and broader regional economic performance (Leoni, 2023). Within Limpopo, however, the uneven spatial distribution of post-school education and training infrastructure presents a significant structural constraint on human capital development. While districts such as Capricorn and Vhembe host the province's two public universities, multiple TVET colleges and the highest concentration of private and sector-accredited training providers, large parts of Waterberg, Mopani and Sekhukhune, despite their importance to mining, agriculture and energy production, remain comparatively underserved. This spatial imbalance limits access to skills development for rural communities and mining-affected areas, reinforcing patterns of labour migration toward urban centres such as Polokwane, Thohoyandou and Tzaneen.

The concentration of education and training opportunities in urban nodes strengthens human capital formation in these areas but simultaneously exacerbates regional inequality by weakening the capacity of peripheral districts to develop and retain skilled labour locally. As a result, employers in rural and resource-dependent areas often face persistent skills shortages, while residents struggle to access training aligned with nearby economic activity. This dynamic reflects both Human Capital Theory and LMM Theory, demonstrating

inefficiencies in the spatial allocation of education investment and misalignment between skills supply and the geographic distribution of labour demand (Auerbach & Green, 2024; Almendarez, 2011).

High levels of unemployment and poverty in Limpopo, particularly in rural municipalities, further compound these constraints by restricting household capacity to finance education, training and transport to distant institutions. Economic deprivation thus directly suppresses human capital accumulation and labour-market participation. National labour-market data consistently show that unemployment declines as educational attainment increases, with graduates experiencing the lowest unemployment rates, followed by individuals with other forms of tertiary education, while those with Matric or less face significantly higher unemployment risks (Statistics South Africa, 2025b). This pattern highlights the importance of improving both access to and completion of post-school education and training in Limpopo, particularly in underserved districts, as a prerequisite for inclusive growth, employment creation and regional economic resilience.

5.3.2. Stakeholder Engagement Findings

The quantitative findings drawn from stakeholder surveys provide a structured, evidence-based extension of the qualitative insights captured in the focus group engagements. Together, these datasets reinforce the systemic patterns identified in the literature—particularly the misalignment between skills supply and labour-market demand, persistent spatial inequalities in training access, and the impact of constrained institutional capacity on the MMS and the broader Limpopo economy. The stakeholder sample included MMS employers, education and training institutions, Skills Development Facilitators (SDFs), SETAs and ward councillors, although organised labour was not represented due to limited availability at the time of engagement.

The analysis focused on three core thematic areas, Skills Mismatch, Barriers to Skills Development, and Strategic Corrective Actions, all of which emerged consistently across literature, primary data and provincial socio-economic indicators.

1. Skills Mismatch: Misalignment Between Training Supply and Labour-Market Demand

Stakeholders were asked to prioritise skills needs both currently and over the next five years. The heatmap in Figure 19 highlights a pronounced divergence between employer demands and the programme development priorities of training institutions in Limpopo.

Limpopo					
	Councillors	Education Institutions	Employers	SDFs	Training Providers
Agriculture	68%	0%	0%	0%	0%
Digital & Technology	15%	100%	45%	33%	50%
Green & Sustainability	16%	100%	27%	18%	0%
Management & Entrepreneurial	42%	50%	45%	22%	17%
Retail & Services	9%	0%	0%	0%	0%
SHEQ / Compliance	0%	0%	45%	9%	0%
Technical & Artisan	40%	0%	73%	15%	0%

Figure 19: 'Skills Mismatch' Analysis Heatmap

A persistent “Technical vs Green” divergence: Employers overwhelmingly ranked Technical and Artisan skills as the foremost priority (73%), reflecting continued dependence on electricians, fitters, instrumentation technicians, mechanical artisans, and mining-specific operators. Yet, education institutions (0%) and training providers (0%) did not identify this area as a primary focus for programme expansion. In contrast, higher education institutions are strongly prioritising Green and Sustainability programmes (100%), while only a minority of employers (27%) foresee this as a critical near-term need. This suggests that the provincial training pipeline is orienting toward the long-term green economy while the current labour market remains heavily reliant on traditional trades, thus highlighting an emerging future-ready versus present-demand mismatch.

Digital skills as a point of convergence: “Digital and Technology” skills were the only category showing clear multi-stakeholder alignment: 100% of education institutions, 50% of training providers, and 45% of employers ranked digital competencies as a priority. This alignment reflects increasing digitisation across mining operations, regulatory systems, renewable energy technologies, and administrative functions, indicating a viable and immediate area for cross-sector collaboration in Limpopo.

2. Barriers Analysis: Understanding What Restricts Skills Development

Stakeholders were then asked to identify the biggest barriers preventing effective skills development. The heatmap in Figure 20 reveals differentiated constraints across provincial actors.

Limpopo			
	Financial Constraints	Operational & Logistical	Structural & Bureaucratic
Councillors	24%	29%	79%
Education Institutions	100%	75%	0%
SDFs	55%	45%	36%
Training Providers	50%	50%	0%
Government	60%	40%	60%
SETAs & Agencies	0%	0%	67%

Figure 20: 'Barrier' Analysis Heatmap

A resource and equipment crisis among providers: Education institutions (100%) and training providers (50%) identified financial and physical resource constraints as the most significant barriers. These include inadequate training equipment, outdated workshop infrastructure, and insufficient funding to scale programmes, issues that are particularly acute in rural TVET colleges and smaller private providers. Notably, these groups did not view system bureaucracy as a major impediment (0%), suggesting that the policy framework is functional, but execution capacity remains thin.

Structural and information barriers for communities: Ward councillors, representing community perspectives, identified structural and bureaucratic constraints as their dominant barrier (79%). These include poor communication about training opportunities, weak coordination between institutions and municipalities, and lack of visibility of programmes in remote areas. For communities, the central challenge is not affordability but access, information and proximity, consistent with Limpopo's rural spatial profile.

A dual burden for government: Government respondents highlighted challenges across both financial (60%) and structural (60%) dimensions, indicating internal coordination issues, limited budgets, and procedural hurdles that slow implementation and hinder collaborative planning.

3. Strategic Fix:

The final theme examined stakeholders' perspectives on the most impactful corrective actions required to strengthen the skills ecosystem. The heatmap in Figure 21 demonstrates clear patterns.

Limpopo				
	Collaboration & Governance	Infrastructure & Access	Curriculum & Alignment	Funding & Incentives
Education Institutions	100%	100%	0%	0%
SDFs	11%	35%	11%	44%
Training Providers	67%	67%	17%	0%
SETAs & Agencies	100%	0%	0%	0%
MMS Employers	0%	18%	36%	27%

Figure 21: 'Strategy Fix' Analysis Heatmap

A “hardware deficit” for education and training institutions: Education institutions (100%) and training providers (67%) prioritised infrastructure and access, with strong emphasis on funding for equipment, workshops and laboratories. This reflects a widespread view that institutions have the mandate to train but lack the physical resources required to deliver high-quality technical and artisan skills. Given Limpopo’s reliance on mining, agriculture, construction and energy, this gap limits the province’s ability to build a robust technical skills pipeline.

A “software deficit” for employers: MMS employers were the only group to emphasise curriculum relevance and alignment (36%). Their concerns focus on programme content that does not adequately reflect emerging technologies, operational realities, or the evolving competency requirements of modernised mining and renewable-energy environments. Employers view curriculum redesign, industry-aligned standards and updated occupational pathways as higher-impact interventions than infrastructure expansion.

Governance and coordination priorities for SETAs: SETAs and agencies (100%) prioritised collaboration and governance improvements, pointing to systemic issues such as poor data sharing, fragmented planning, and lack of integrated monitoring mechanisms. This confirms that from a SETA perspective, the central problem is not funding but structural coordination across the skills ecosystem.

Funding and grant incentives highlighted by SDFs: SDFs emphasised the need for expanded funding and incentives (44%), particularly relating to discretionary grants, employer participation in learnerships, and support for workplace-based learning. This group sees grant design and financial incentives as leverage points for improving participation and expanding training opportunities.

5.3.3. Data Collection Findings

Across the qualitative and quantitative data, a persistent mismatch between skills supply and labour-market demand is evident, reflecting well-documented limits in translating human capital investment into sustainable employment outcomes (Leoni, 2023; Auerbach & Green, 2024; Almendarez, 2011). Many community and stakeholder participants reported having completed theoretical programmes, particularly N1 - N6 engineering studies, National Certificate (Vocational) streams or short technical courses, without progressing to recognised trade certification or structured workplace exposure. In a provincial context where only a small proportion of MMS employees hold artisanal trade certificates and a large share of training is concentrated in refresher, induction and short courses, this lack of full qualification pathways and practical experience significantly constrains employability, occupational progression and prospects for self-employment or enterprise development (MQA, 2025a; MQA, 2025c).

Limited access to accredited trade-testing facilities, scarce workplace placement opportunities and the distance to better-resourced centres such as Polokwane and Phalaborwa emerged as binding constraints, particularly for youth and not-in-employment-education-or-training (NEET) populations in rural and mining-affected municipalities. From a labour-market-mismatch perspective, this disconnect illustrates that skills accumulation alone is insufficient when learning pathways are incomplete or poorly aligned with employer requirements and viable occupational trajectories.

Stakeholders also characterised training provision in Limpopo as fragmented and, in many cases, compliance-driven rather than demand-led. A large share of planned and completed training within the MMS remains focused on induction, refresher, licensing and mandatory safety interventions, with fewer opportunities leading to full occupational qualifications in high-priority trades and technical roles (MQA, 2025a). Programmes are not always informed by systematic skills audits or district-level analyses capable of identifying priority occupations, cross-cutting digital and OHS competencies, or reskilling pathways into emerging sectors such as renewable energy, environmental rehabilitation and agricultural processing. Weak feedback loops between employers, TVET colleges, private providers, SETAs and the MQA, compounded by coordination and information gaps flagged in the stakeholder heatmaps, limit curriculum responsiveness to new technologies, green skills requirements and changing production systems (Department of Higher Education and Training (DHET), 2022a; MQA, 2025a). Although WSPs are generally perceived by employers as aligned with immediate operational needs, the high cost of training, funding constraints for equipment and infrastructure, and difficulties in accessing discretionary grants were identified as major barriers to implementation, even where MQA-accredited programmes are viewed as technically sound.

Within Limpopo's MMS, critical shortages are most acute in artisan, engineering, supervisory and machine-operator occupations, such as electricians, millwrights, diesel mechanics, drill rig and LHD operators, rock engineers and instrumentation technicians, alongside rising demand for digital and green-economy skills associated with mechanisation and the energy

transition in regions such as Waterberg and Phalaborwa (MQA, 2025c; Energy and Water Sector Education and Training Authority (EWSETA), 2023; Department of Science and Innovation (DSI), 2022). Stakeholders also pointed to growth potential in agriculture, construction, logistics and renewable-energy-related occupations, reinforcing the need for transferable and enabling competencies (management, leadership, ICT, project management and OHS) that support labour mobility across sectors. However, the ability of training institutions to respond remains constrained by limited workshop and laboratory equipment, uneven programme-updating cycles, and persistent challenges in securing workplace placements in remote mining towns and rural municipalities.

Collectively, these findings underscore the coexistence of unemployment and skills shortages as a function of misalignment across the provincial skills system, rather than a lack of training activity. The next section builds on this analysis by mapping a skills-provider-occupation nexus for Limpopo, systematically comparing identified occupational needs with existing institutional provision to highlight areas of alignment, critical gaps and priorities for targeted intervention.

5.3.4. Institution-Skills-Occupations Nexus Matrix

The matrix in Table 15 maps the alignment between Limpopo's education and training institutions and the province's identified occupational and skills requirements in the Mining and Minerals Sector (MMS). It is designed to support provincial skills planning by illustrating where provider capacity meets sectoral demand, and where persistent or emerging gaps remain. The analysis draws on the Limpopo-specific WSP data, hard-to-fill vacancies, provider mapping and stakeholder engagements discussed earlier, recognising that while mining remains the centre of gravity in the province, diversification into adjacent and emerging sectors, particularly agriculture, renewable energy, digital technologies and environmental rehabilitation, will be essential for long-term labour-market resilience.

Given Limpopo's spatial distribution of education and training infrastructure, highly concentrated in Capricorn and Vhembe and comparatively limited in Waterberg, Sekhukhune and Mopani, the Institution-Skills Occupations Nexus Matrix also highlights geographic constraints that affect workforce development. It integrates all major skills categories identified, including those required for occupational transition linked to mechanisation and the Just Energy Transition.

Key:

✓ = Direct provision/ strong alignment

● = Partial/enabling provision

— = No direct provision identified

Table 15: Institution-Skills-Occupations-Nexus-Matrix

Skills / Operational Area	Positions linked to Skills / Operational Area	Source	MQA-Accredited Mining Providers	TVET Colleges	Universities	Private Colleges
Underground Mining Operations (Hard Rock)	Miner; Mine Overseer (Production); Mining Production Supervisor; Shift Foreman/Boss (Mining); Shaft Timberman; Strata Control Practitioner	Hard to fill vacancies from WSP Data	✓	—	—	—
Rock Drill Operator / Rock breaking	Hydraulic Rock Breaker Operator	Hard to fill vacancies from WSP Data	✓	● (Sekhukhune/Lephalale = partial exposure)	—	—
Blasting Operations	Surface/Underground Blaster; Blasting Assistant	Hard to fill vacancies from WSP Data	✓	—	—	—
Mine Safety and Occupational Health and Safety (OHS) Representatives	Chief Safety Officer Mining; Mine Health and Safety Inspector; OHS Practitioners	Hard to fill vacancies from WSP Data / Data collection	✓	●	—	● (Short Courses)
Mineral Processing Operators / Metallurgical Plant	Plant Operator (Crushing and Screening); Control Room Operator; Tailings Operations	Top-up Skills / Hard to fill vacancies from WSP Data	✓ (Palabora, Steelpoort)	● (Mopani SE/Vhembe)	●	—
Mobile Machinery Operators (Surface and TMM)	LHD Operator; Excavator Operator; Earthmoving Plant Operator (General); Machine Operators	Hard to fill vacancies from WSP Data / Top-up Skills	✓	● (Waterberg /Mopani)	—	—
Engineering Trades (Electrical / Mechanical / Welding)	Artisans; Boilermaker Aide; Electrical; Electrician Armature Winder; Fitter and Turner; Millwright (Electro-mechanician); Plumbing	Data collection / Hard to fill vacancies from WSP Data	●	✓	●	✓
Diesel Mechanics / Earth Moving Equipment Mechanic / Motor Trade	Diesel Mechanic/Mechanic; Heavy Equipment Mechanic	Hard to fill vacancies from WSP Data	—	✓ (Waterberg /Lephalale)	—	✓
Instrumentation and Industrial Electronics	Instrumentation Technician; Automation	Hard to fill vacancies from WSP Data / Data collection	—	✓	●	✓
Mining Engineering (Professional / Technologist)	Engineers; Mining Engineering Manager; Mine Manager	Hard to fill vacancies from WSP Data / Data collection	—	—	✓	—

Skills / Operational Area	Positions linked to Skills / Operational Area	Source	MQA-Accredited Mining Providers	TVET Colleges	Universities	Private Colleges
Metallurgy / Mineral Resource Management	Mining: Metallurgy and Resources	Expanded learning areas identified through triangulation of data collection findings and WSP evidence.	●	✓	✓	—
Geology / Geohydrology / Survey	Mining: Geological Sciences; Mine Surveyor	Expanded learning areas identified through triangulation of data collection findings and WSP evidence.	—	● (Survey basics)	✓	—
Environmental Management and Mine Rehabilitation	Environmental rehabilitation; Environmental Sustainability/Compliance; Mine Environmental Control Supervisor; Green skills; Closure Specialist	Data collection / Hard to fill vacancies from WSP Data	●	●	✓	—
Construction and Civil Infrastructure	Construction; Infrastructure maintenance; Plate Layer	Data collection / Hard to fill vacancies from WSP Data	—	✓	✓	✓
Renewable Energy (Solar, Wind, Electrical)	Solar PV Tech; Energy Technician; Renewable Energy; Green skills	Data collection	—	● (Capricorn/Waterberg)	●	●
Digital and ICT Skills (IT Support, Systems, Data)	Computer skills; Digital Literacy; Digital Skills; IT Skills; Data Management Manager	Data collection / Hard to fill vacancies from WSP Data	—	●	✓	✓
Entrepreneurship / New Venture Creation	Entrepreneurial; Business Owner; SMME Development; Co-op Development	Data collection	—	●	✓	—
Agriculture and Agricultural processing	Agriculture/Farming	Data collection	—	✓ (Letaba/Vhembe)	●	✓
Agricultural Machinery Operators and Irrigation Systems	Agriculture: Machinery Operations; Irrigation Technician	Expanded learning areas identified through triangulation of data collection findings and WSP evidence.	—	✓	—	✓
Food Processing and Quality Control	Agriculture: Food Processing; Food Safety Technician	Expanded learning areas identified through triangulation of data	—	✓	●	✓

Skills / Operational Area	Positions linked to Skills / Operational Area	Source	MQA-Accredited Mining Providers	TVET Colleges	Universities	Private Colleges
		collection findings and WSP evidence.				
Logistics, Transport and Supply Chain	Procurement Administrator / Coordinator / Officer; Supply Chain Practitioner	Hard to fill vacancies from WSP Data	—	●	✓	●
Community Services and Public Works	Office Administration; Moderators; Training Coordinator; Training Manager; Training and Development Professional; Audit and Assurance Manager; Internal Auditor; Organisational Risk Coordinator	Data collection / Top-up Skills / Hard to fill vacancies from WSP Data	—	✓	✓	✓

The matrix illustrates strong alignment between Limpopo's MQA-accredited training providers and the core operational skills required in the province's mining and minerals sector. These providers, located primarily in Polokwane, Mokopane, Phalaborwa and the Burgersfort/ Steelpoort mining region, offer well-established programmes in underground hard-rock mining, rock breaking, blasting assistance, mineral processing, safety compliance and production-critical occupations. This confirms that replacement demand within the MMS can largely be met through existing accredited provision, particularly for occupations such as Rock Drill Operators, Blasting Assistants, Mine Overseers, and OHS practitioners, which appear prominently in the WSP hard-to-fill vacancy list.

Limpopo's TVET colleges and private colleges provide an essential technical and artisan pipeline across electrical, mechanical, welding, fitting and diesel-mechanic trades. These programmes support mining operations as well as skills portability in other key provincial sectors, including construction, agriculture, logistics, renewable energy and municipal services. With seven TVET colleges and a concentration of private engineering and ICT colleges in Polokwane, this training landscape plays a critical role in addressing Limpopo's continued reliance on artisans and technicians across multiple industries.

The University of Limpopo and the University of Venda supplement this ecosystem by producing professional and advanced skills in geology, environmental science, ICT, engineering-related fields and management sciences. However, graduate output remains limited relative to the province's demand for engineers, surveyors, geologists, environmental practitioners and digital specialists, leading to continued reliance on recruitment from outside the province for many technical and professional roles.

Specialised and sector-aligned providers, such as the Palabora Foundation, AgriSETA-aligned agricultural training centres, CHIETA-accredited chemical and process training programmes, and EWSETA's renewable-energy skills initiatives, further expand access to transition-oriented skills. These include environmental management, plant operations, solar PV installation and community-based technical programmes, skills increasingly required in regions like Waterberg, where the JET is reshaping economic activity. Despite this, spatial access remains uneven, with rural municipalities in Waterberg, Mopani and Sekhukhune continuing to face limited training infrastructure despite hosting major mining, agricultural and energy operations.

Gaps remain across several critical skill areas. Provision for integrated mine rehabilitation, closure and environmental restoration pathways is limited, even as these skills become increasingly necessary for both regulatory compliance and long-term economic sustainability in mining communities. Similarly, digital, automation and data-driven competencies are fragmented across institutions. While private ICT colleges and universities offer relevant programmes, these skills are not yet systematically embedded into mining-specific, engineering or artisanal training pathways, restricting Limpopo's readiness for mechanised and digital mining systems.

The matrix also highlights the prevalence of vertical silos between universities, TVET colleges, private institutions and MQA-accredited providers. These institutions largely operate in isolation, with limited articulation pathways, coordinated curriculum planning, or joint engagement with employers. As a result, the provincial system suffers from weak sequencing and limited horizontal and vertical integration, which undermines the potential impact of individual programmes and contributes to persistent skills mismatches and uneven labour-market absorption.

Overall, the findings suggest that Limpopo's training capacity is not inherently insufficient. Instead, the province faces a systems-level coordination challenge, where misalignment between training supply, employer demand and spatial accessibility constrains the effectiveness of the provincial skills pipeline. Addressing these gaps will require improved coordination, structured pathways across provider types, and targeted investment in equipment, digital training and community-level access to ensure inclusive and demand-responsive skills development.

5.4. Community and Cross-Sectoral Skills Needs

This section examines cross-sectoral skills demand, community-level skills needs in mining-affected areas, and the role of entrepreneurship in strengthening local economic resilience within the Limpopo Province. The analysis draws on a comparative review of relevant SSPs, supported by secondary literature and primary data collected through stakeholder engagements across mining, agriculture, energy, services and local government structures in the province. Attention is given to sectors with stronger employment and transition potential in Limpopo, especially agriculture and agricultural processing, construction and infrastructure maintenance, renewable energy, public services, tourism and wholesale and retail trade, as well as to transferable and enabling skills that support labour mobility beyond mining.

Considering Limpopo's vast number of rural communities, mining dependency and spatial inequality, the analysis places specific emphasis on skills development opportunities accessible to communities located near mining operations, including those in the Waterberg, Sekhukhune, Mopani and Vhembe districts. These pathways are assessed in relation to their capacity to support reskilling, self-employment and enterprise development, particularly for youth, retrenched mineworkers and other vulnerable groups.

To ensure comparability across sectors, only SSP data aligned to the OFO was utilised. This approach enabled consistent comparison of occupational demand across sectors and improved the reliability of cross-sector skills mapping in the Limpopo context.

The most recent available SSPs listed below were reviewed alongside the latest MQA Sector Skills Plan, which remains central given the continued importance of the mining and minerals sector to Limpopo's provincial economy (MQA, 2025a):

- Agriculture Sector Education and Training Authority (AgriSETA) (Agriculture Sector Education and Training Authority, 2025)

- Culture, Arts, Tourism, Hospitality and Sport Sector Education and Training Authority (CATHSSETA) (Culture, Arts, Tourism, Hospitality and Sport Sector Education and Training Authority, 2024)
- Chemical Industries Sector Education and Training Authority (CHIETA) (Chemical Industries Sector Education and Training Authority, 2024)
- Energy and Water Sector Education and Training Authority (EWSETA) (Energy and Water Sector Education and Training Authority (EWSETA), 2023)
- Finance and Accounting Services Sector Education and Training Authority (FASSET) (Finance and Accounting Services Sector Education and Training Authority, 2025)
- Local Government Sector Education and Training Authority (LGSETA) (Local Government Sector Education and Training Authority, 2024)
- Public Service Sector Education and Training Authority (PSETA) (Public Service Education and Training Authority, 2024)
- Services Sector Education and Training Authority (Services SETA) (Services Sector Education and Training Authority, 2025)
- Wholesale and Retail Sector Education and Training Authority (W&R SETA) (Wholesale and Retail Sector Education and Training Authority, 2024)

Only SSP data where OFO codes were explicitly provided were included in the analysis, ensuring methodological consistency and enabling accurate comparison of skills demand across sectors relevant to Limpopo's evolving labour market.

5.4.1. Cross-Sectoral Skills Commonality and Occupational Gaps

The cross-SETA analysis for Limpopo reveals a recurring set of skills that are consistently demanded across both mining and non-mining sectors, reflecting the province's diversified—but unevenly developed economic landscape. Despite Limpopo's strong dependence on mining (particularly PGMs, chrome, coal and copper), the province also demonstrates substantial activity in agriculture, retail, logistics, public services and an expanding green-energy and environmental-rehabilitation space. As a result, a core group of transferable and enabling skills emerges across multiple SSPs. In descending order of frequency, these include management, communication, leadership, computer literacy, supervisory competence and office administration. Their recurrence underscores the importance of these transversal capabilities in supporting labour mobility across Limpopo's dominant sectors, mining, agriculture, manufacturing, services, tourism and emerging green-economy value chains.

At an occupational level, several skills gaps were found to be common across the MQA and other SETAs, indicating structural shortages in the province's labour market. These include:

- 2021-132104 - Maintenance/ Engineering Manager: identified by both the MQA and CHIETA, reflecting the shortage of high-level engineering oversight in Limpopo's mining, energy and agricultural processing facilities.

- 2021-226302 - Safety, Health, Environment and Quality (SHEQ) Practitioner: highlighted by the MQA and W&RSETA, consistent with intensified regulatory requirements across mining, retail, logistics and municipal services.
- 2021-312201 - Production/ Operations Manager (Manufacturing): common to MQA, AgriSETA and CHIETA, mirroring Limpopo's growing agricultural processing and light-manufacturing footprint, especially in Tzaneen, Modimolle and Musina.
- 2021-411101 - Administration Clerk: appearing across the MQA and CHIETA, reflecting province-wide needs for administrative support in mining operations, logistics depots, agricultural processing facilities and public-sector offices.
- 2021-671101 - Electrician: prioritised by the MQA and EWSETA, consistent with shortages in mining operations, rural electrification projects, water schemes and renewable-energy installations in the Waterberg region.

The recurrence of these occupations across multiple SETAs points to systemic and cross-cutting shortages rather than sector-specific gaps. Limpopo's economy relies strongly on mid-level technical supervision, safety compliance, production management and electrical/mechanical support roles, all of which are essential for mining operations, agricultural value chains, manufacturing plants, municipal infrastructure and new-energy developments.

HTFVs across SETAs further reinforce this pattern. As shown in Table 16, Limpopo faces persistent shortages in engineering managers, electricians, mechanical and electrical technicians, diesel mechanics, millwrights and SHEQ practitioners. These occupations cut across mining houses in Burgersfort and Mokopane, agricultural processing hubs in Mopani and Vhembe, manufacturing nodes in Polokwane, and energy and water infrastructure projects in Waterberg.

Together, these findings highlight that skills shortages in Limpopo are broadly systemic, influenced by:

- limited access to technical training infrastructure in rural districts,
- insufficient workplace placements for artisanal and engineering learners,
- high demand generated by mining mechanisation and energy transition projects, and
- weak coordination between SETAs, employers and training institutions.

This cross-sectoral analysis therefore emphasises the need for integrated, regionally responsive skills planning to ensure that training supply aligns with both current labour-market demands and Limpopo's longer-term growth trajectories.

Table 16: Cross-sectoral Hard-To-Fill-Vacancies

OFO	Occupational Title	AgriSETA	CATHSSETA	CHIETA	EWSETA	FASSET	LGSETA	MQA	PSETA	W&RSETA
2021-132104	Engineering / Maintenance Manager			X				X		
2021-215101	Electrical Engineer			X	X			X		
2021-215201	Instrumentation Engineer / Technician				X			X		
2021-226302	Safety, Health, Environment & Quality (SHEQ) Practitioner							X		X
2021-312201	Production / Operations Manager (Manufacturing)	X		X				X		
2021-411101	Administration Clerk / Office Administrator			X				X		
2021-671101	Electrician				X			X		
2021-671202	Millwright (Electro-mechanic)	X		X				X		
2021-653306	Diesel Mechanic	X						X		
2021-651302	Boilermaker			X				X		
2021-311401	Electronic Engineering Technician			X				X		
2021-311701	Strata Control Practitioner							X		
2021-216502	Mine Surveyor							X		
2021-214601	Rock Engineer							X		
2021-132104	Engineering / Maintenance Manager				X			X		
2021-215101	Electrical Engineer				X					

5.4.2. Emerging and Diversifying Economic Sectors in Limpopo

The gradual restructuring of Limpopo's economy, driven by mining mechanisation, commodity-price volatility and the global energy transition, has intensified the need to diversify beyond traditional extractive activities. While mining remains central to provincial output and employment, particularly within the BIC, the Waterberg coal region and the Phalaborwa copper belt, Limpopo is increasingly positioning itself to leverage opportunities in renewable energy, green hydrogen, agricultural processing and the broader green economy. These sectors are recognised as important pathways for mitigating labour-market disruptions associated with mining modernisation and strengthening long-term provincial resilience and inclusive growth (Limpopo Provincial Government, 2025b; TIPS, 2024b).

Renewable energy is one of the most promising emerging sectors in Limpopo, especially in the Waterberg and parts of Capricorn and Sekhukhune, where high solar irradiation and land availability support utility-scale projects. Although acceptance has been slower than in some other provinces, solar and hybrid energy developments around Lephalale, Mokopane and Musina are expanding, creating demand for skills in construction, electrical services, plant operations, environmental monitoring and maintenance. Emerging and specialised roles include solar PV technicians, battery storage specialists, grid-support technicians, environmental impact assessors and data analysts, many of which overlap with technical and

engineering skills prevalent in Limpopo's mining workforce (Department of Higher Education and Training (DHET), 2024a; Sustainability Directory, 2025).

Closely linked is the anticipated growth of the green hydrogen economy, with Limpopo identified as a strategic region due to its PGM reserves used in fuel cells and electrolyzers. South Africa's Hydrogen Society Roadmap highlights PGM-rich regions such as Limpopo, critical to hydrogen production, storage and catalytic innovation (Department of Science and Innovation (DSI), 2022). This transition is expected to increase demand for engineers, project managers, environmental and safety specialists, software developers, supply-chain managers, electricians, fitters and turners, as well as geologists and metallurgical engineers, occupations that require targeted reskilling and upskilling pathways (Department of Higher Education and Training (DHET), 2024a).

Beyond energy, agricultural processing represents a key transitional opportunity for Limpopo, building on strong agricultural production in Mopani, Vhembe and Capricorn. Expansion in fruit and nut processing, cold-chain logistics, and export-oriented value chains (specifically citrus, macadamias and avocados) is generating demand for technical, managerial and logistics skills. The Musina-Makhado Special Economic Zone (MMSEZ) further positions the province for agricultural processing, metallurgical activities and logistics-linked industrial development, subject to infrastructure and energy-security constraints (Limpopo Provincial Government, 2025b; TIPS, 2024b).

Limpopo's growing manufacturing and logistics activities, anchored by Polokwane as a provincial hub and regional transport corridors linking to neighbouring SADC markets, create additional opportunities in warehousing, transport management, industrial maintenance and processing industries linked to mining, agriculture and construction (Limpopo Provincial Government, 2025b).

Collectively, these emerging and transitional sectors signal a gradual shift toward a more diversified provincial economy that complements the MMS. Realising their employment potential depends on effective alignment between economic planning, skills development systems and labour-market demand. From a labour-market mismatch and systems perspective, inclusive growth will require demand-led, coordinated skills pathways, stronger industry, training linkages and responsive institutional planning across TVET colleges, universities, private providers and SETAs (Department of Higher Education and Training (DHET), 2024a; TIPS, 2024b).

5.4.3. Entrepreneurship

Entrepreneurship plays a critical role in Limpopo's socio-economic landscape, where persistent unemployment, limited formal labour absorption, and a mining-dependent economy undergoing structural transition have intensified the need for alternative livelihood pathways. As a province characterised by a high proportion of youth, extensive rural areas, and uneven spatial development, entrepreneurship is increasingly recognised as both a key livelihood strategy and a mechanism for driving local economic diversification (Statistics

South Africa, 2025b). According to national small business trends, Limpopo hosts a large number of informal and micro-enterprises, particularly in rural municipalities where formal employment opportunities remain scarce, a pattern broadly consistent with provincial development analyses (TIPS, 2024b).

From a Human Capital Theory perspective, entrepreneurship allows individuals to productively apply accumulated skills, tacit knowledge, and experience towards income generation and self-employment (Leoni, 2023). The LMM Theory reinforces this view by emphasising that entrepreneurship can emerge as a response to weak alignment between labour-market opportunities and the available skills base, particularly in provinces where mining, agriculture, and the public sector cannot absorb the growing workforce (Auerbach & Green, 2024). Systems Theory adds that entrepreneurial success in Limpopo depends not only on individual capability but also on the strength and responsiveness of institutional structures, including funding mechanisms, regulatory systems, market access pathways, and local development support networks (UNESCO, 2023).

Within Limpopo, various provincial and national initiatives have sought to strengthen entrepreneurship, SMME development, and local economic participation. The Limpopo Department of Economic Development, Environment and Tourism and agencies such as the Limpopo Economic Development Agency (LEDA) regularly implement programmes focused on enterprise development, market access, and rural SMME support, while national campaigns such as National Entrepreneurship Month have been used to promote youth entrepreneurship, township enterprises, and cooperative development (South African Government, 2024). These interventions highlight key constraints commonly faced by entrepreneurs, such as limited access to finance, inadequate mentorship, weak market linkages, and challenges in business compliance, while acknowledging the significant role played by the informal economy in sustaining livelihoods across the province's rural and mining communities (Limpopo Department of Economic Development, Environment and Tourism (LEDET), 2024).

Entrepreneurial skills in Limpopo extend beyond technical competence and require a holistic blend of business management capabilities and soft skills. Technical skills enable entrepreneurs to offer products and services within sectors such as renewable energy, agro-processing, tourism, and mining-related services. However, business management skills, including financial planning, marketing, operations, compliance, and strategic decision-making, are essential for ensuring business sustainability. Equally important are soft skills such as leadership, communication, adaptability, negotiation, and problem-solving, which enable entrepreneurs to navigate uncertainty, engage stakeholders, and manage growing enterprises effectively (OECD, 2020). This diverse skillset is particularly critical in rural municipalities of Limpopo, where entrepreneurs often operate in highly constrained market environments.

Overall, the skills landscape in Limpopo reflects a complex interplay between a strong concentration of employment in platinum group metals and related mining sub-sectors,

persistent technical and artisanal shortages, and a training footprint that remains heavily focused on induction, compliance, and refresher training (MQA, 2025c; MQA, 2025b). While the WSP data indicate ongoing investment across multiple training types, the continued presence of hard-to-fill vacancies, particularly in engineering, technical, supervisory, and managerial occupations, reveals deeper structural challenges related to experience gaps, qualification mismatches, rural access barriers, and limited career progression pathways. Cross-sectoral analysis also shows a recurring need for transferable skills such as management, leadership, communication, digital literacy, and health and safety, which are essential across mining, agriculture, manufacturing, services, and emerging green-economy sectors.

When viewed through the lenses of Human Capital Theory, LMM Theory, and Systems Theory, these findings underscore the need for a more integrated, demand-led approach to skills development that aligns training provision with economic transition, emerging opportunities in renewable energy and agricultural-processing, and strengthened entrepreneurship support. Such alignment will be essential if Limpopo is to translate skills investment into improved labour-market absorption, sustainable livelihoods, and inclusive provincial growth amid ongoing structural and technological change.

5.4.4. Synthesis of Data Collection Findings: Community and Cross-Sectoral Skills Needs

Primary data collected from stakeholders across the Limpopo Province reinforced the cross-sectoral patterns identified in the literature and the provincial skills gap analysis (MQA, 2025c; Statistics South Africa, 2025b). Stakeholders consistently emphasised that while mining remains a major employer, particularly in PGM-rich districts such as Sekhukhune, Waterberg and Capricorn (MQA, 2025c). Long-term resilience depends on broader transferable skills that enable mobility into agriculture, agricultural processing, manufacturing, environmental rehabilitation, renewable energy, construction, logistics and services. Successful transition into these sectors requires not only specialised technical competencies, but also foundational and portable skills such as digital literacy, entrepreneurship, communication and basic business management (Department of Higher Education and Training (DHET), 2024b; Leoni, 2023). These skills were viewed as essential for enabling mineworkers, unemployed youth and rural communities to participate meaningfully in emerging economic opportunities within the province.

Digital skills emerged as one of the most pervasive cross-cutting gaps in Limpopo, aligning with national assessments of digital readiness and skills shortages in both mining and the broader economy (Department of Science and Innovation (DSI), 2022; Department of Higher Education and Training (DHET), 2024b). Despite widespread access to smartphones, digital literacy levels remain low across most rural municipalities, constraining productivity, safety communication, access to online training platforms and participation in technology-driven occupations. Many workplaces and training centres, especially rural TVET campuses, still rely on paper-based systems, limiting exposure to automation, data analytics, and digital

monitoring technologies increasingly used in mining and renewable energy operations (Minerals Council South Africa, 2025c). Stakeholders emphasised that the lack of digital competency restricts not only employment opportunities but also the growth of small enterprises that rely on digital marketing, mobile payments and online compliance systems.

Entrepreneurship was widely recognised as a critical skill towards growth and sustainability in Limpopo, particularly in mining-dependent districts facing mechanisation, retrenchments and limited labour absorption. This aligns with national policy framing the informal and small enterprise sectors as essential contributors to local economic development (South African Government, 2024). However, participants stressed that technical skills alone do not translate into sustainable enterprises. Small-scale miners, informal traders and cooperative enterprises require complementary capabilities such as financial management, compliance, licensing, bookkeeping and digital marketing (OECD, 2020). Stakeholders noted that current enterprise support systems remain fragmented and often inaccessible due to weak coordination, administrative barriers and the physical distance between rural communities and training institutions (Department of Higher Education and Training (DHET), 2023a).

A major theme throughout stakeholder consultations was the spatial barrier to training access. Many rural areas in Vhembe, Mopani, Waterberg and Sekhukhune have limited proximity to accredited training centres, which forces young people to travel long distances at high cost (Limpopo Provincial Government, 2025c). The uneven geographic distribution of TVET colleges and private providers, combined with poor public transport, continues to constrain participation in artisan training, engineering studies and ICT programmes, contributing to low completion rates and reinforcing LMM (Auerbach & Green, 2024; Almendarez, 2011). These structural barriers significantly restrict human capital development in districts where mining, agriculture and tourism remain the main economic activities.

Stakeholders also highlighted specific occupations where critical shortages and hard-to-fill vacancies persist. These include artisans (electricians, fitters and turners, boilermakers, diesel mechanics), engineers (electrical, mechanical, civil, mining), instrumentation technicians, OHS practitioners, environmental officers, renewable energy technicians, agricultural processing technologists and ICT specialists, skills which align with Limpopo's transition towards a green and diversified economy (MQA, 2025c; Department of Higher Education and Training (DHET), 2024b). Employers indicated that these vacancies remain unfilled due to inadequate local training supply, limited workplace-based learning opportunities and insufficient practical experience among graduates (MQA, 2025c). Concerns about job security, mechanisation and the future impact of Just Energy Transition were also widely expressed, particularly among mineworkers and youth.

Youth and community members identified a strong interest in practical, employability-oriented skills such as computer literacy, office administration, farming and agricultural production, construction trades, electrical work, welding, solar PV installation and small-business management, skills aligned with emerging economic opportunities in the province (TIPS, 2024b; Department of Science and Innovation (DSI), 2022). However, awareness of available

training programmes remained low. Many participants reported challenges in accessing bursaries, learnerships and SETA-funded opportunities due to administrative bottlenecks, inconsistent communication, and limited outreach by training institutions.

Collectively, these findings highlight the need for cross-sectoral, community-oriented and demand-led skills strategies that move beyond narrow compliance-based training. Strengthening alignment between provincial growth sectors, labour-market demand, and training provision will require improved coordination between employers, unions, SETAs, TVETs, universities, municipalities and community structures (Department of Higher Education and Training (DHET), 2024b). Addressing spatial inequalities in training access, expanding reskilling pathways for sectoral transition and embedding digital and entrepreneurial skills into training programmes will be critical to enabling inclusive economic development and positioning Limpopo's workforce for long-term labour-market resilience.

5.5. MQA Programme Accessibility and Impact

Stakeholder engagements provided some insights into the accessibility, effectiveness and perceived impact of MQA-supported programmes within the Limpopo Province, particularly when considered alongside training priorities and constraints reflected in WSP data submitted by mining and related employers. Overall, stakeholders recognised the MQA as a central institutional actor in supporting skills development within Limpopo's mining and minerals sector, especially given the province's concentration of PGM, coal and copper operations. However, they also highlighted a range of structural and implementation challenges that limited programme reach, equity and longer-term labour-market impact.

Access to MQA grants, learnerships and bursaries was perceived as uneven across employers and communities. Larger, established mining operations in districts such as Sekhukhune, Waterberg and Capricorn were generally more successful in accessing funding and aligning training with operational requirements, whereas smaller employers, contractors and rural communities struggled with administrative difficulty, limited capacity and insufficient information. Stakeholders further highlighted that funding constraints for training equipment, workshop upgrades, digital infrastructure and simulation facilities severely limited the ability of many TVET colleges and training centres in Limpopo to deliver high-quality, occupationally relevant programmes. This was particularly problematic for trades and technical occupations with large practical components, contributing to persistent gaps in artisan readiness and workplace competence.

Learnerships and bursaries were widely regarded as valuable, particularly for youth and unemployed individuals, but their effectiveness was undermined by insufficient placement opportunities, high administrative requirements and incomplete funding for full learning pathways, including trade testing. NEET youth and rural communities, especially in Vhembe, Mopani and Sekhukhune, faced additional barriers including transport costs, limited access to training institutions, and low awareness of available opportunities.

In terms of quality and relevance, many MQA-supported programmes were viewed positively when implemented successfully. However, stakeholders repeatedly noted that training remained short-course oriented and compliance-driven, aligning with immediate production and safety needs but offering limited long-term progression. These patterns, combined with ongoing hard-to-fill vacancies for artisans, technicians, supervisors and engineers, suggested that existing interventions were not adequately addressing structural weaknesses in the skills pipeline, including experience gaps and trade-test bottlenecks.

A significant concern raised was the misalignment and weak coordination between SETAs, TVET colleges, universities, community training centres and employers. Stakeholders described fragmented planning cycles, inconsistent communication, and delays in accreditation or programme approvals. This fragmentation undermined the coherence of training routes and hampered efforts to scale reskilling initiatives aligned to Limpopo's emerging economic sectors.

Stakeholders consistently emphasised the growing importance of reskilling and upskilling beyond traditional mining occupations, especially in the context of mechanisation and the JET. While some MQA programmes provided foundational or transferable skills, there was limited evidence of structured transition opportunities into alternative sectors relevant to Limpopo's diversification trajectory, such as agriculture and agricultural processing, renewable energy technologies, environmental rehabilitation, manufacturing, construction and community-based services.

The proximity of training institutions to communities continuously emerged as a critical barrier. Many rural areas, especially deep-rural parts of Vhembe, Mopani and Sekhukhune, do not have nearby accredited training centres or artisan facilities, resulting in significant transport and accommodation burdens for learners. These spatial barriers directly limit participation in learnerships, skills programmes and artisan routes, reinforcing inequality between urban and rural areas.

Digital skills, green skills, technical and artisan competencies, and business and entrepreneurial capabilities were consistently identified as priority enablers of occupational mobility and sectoral transition. However, stakeholders stressed that these competencies must be supported by better-funded institutions, improved coordination across SETAs, and stronger employer-SETA-MQA partnerships to translate training into employment or enterprise opportunities.

Overall, the findings indicate that while MQA programmes play a central and generally positive role in supporting skills development in Limpopo's mining sector, their impact is constrained by funding limitations, infrastructure deficits, spatial inequalities, administrative burdens and weak system-wide coordination. Enhancing programme accessibility in rural districts, strengthening full qualification and certification pathways, improving SETA-institution alignment and forging deeper partnerships between employers and SETAs/MQA

will be critical for improving labour-market outcomes and building a resilient, transition-ready workforce in the province.

5.6. Stakeholder Mapping and Partnerships

5.6.1. Overview of Stakeholder Landscape

The stakeholder mapping exercise identified a broad and diverse set of actors engaged in the skills development ecosystem in Limpopo. These stakeholders operate across national, provincial, district and community levels and collectively influence skills planning, funding, delivery and labour-market absorption. While roles and mandates differ, the overall effectiveness of the skills system depends on the extent to which these actors are aligned, coordinated and able to collaborate around shared priorities.

Qualitative evidence indicated that, although multiple stakeholders are active, coordination remains weak and fragmented. Collaboration was generally described as ad hoc and largely compliance-driven, with limited joint planning, shared use of labour-market intelligence or pooled resourcing. Existing coordination structures at the provincial and local level were perceived as procedural rather than strategic, limiting their effectiveness in driving place-based and demand-responsive skills interventions. These findings point to systemic challenges in stakeholder alignment rather than an absence of institutional participation.

5.6.2. Key Stakeholders in the Skills Development System

A range of stakeholder categories were identified as central to the functioning of the provincial skills ecosystem, spanning skills authorities, government, education and training institutions, industry, labour, community structures and enterprise support agencies, see Table 17. Each category fulfils a distinct but interdependent role, contributing to skills planning, programme implementation, labour-market access or community participation.

National-level actors provide sector skills planning, funding frameworks, programme oversight, and labour market intelligence, while provincial stakeholders play a critical role in translating national priorities into coordinated implementation aligned with provincial development objectives. District and local structures serve as the primary interface with communities and local economies, supporting place-based delivery and localisation of skills initiatives. Education and training institutions are responsible for curriculum delivery and learner support, while employers articulate skills demand, offer workplace learning opportunities, and absorb trained individuals. Community and labour structures contribute vital insights into access barriers, equity considerations, and local needs, while enterprise and youth-focused agencies support transitions into employment, self-employment, and entrepreneurship.

Table 17: Stakeholder categories, roles and alignment

Stakeholder Category	Key Stakeholders	Primary Role in Skills System	DDM Alignment
National Skills Authorities	MQA and other relevant SETAs, including but not limited to AgriSETA, CATHSSETA, CHIETA, EWSETA, FASSET, LGSETA, PSETA & W&RSETA	Sector skills planning, funding allocation, programme oversight, labour-market intelligence	National policy alignment; sector coordination
National Government	DHET; Department of Employment and Labour (DEL); Department of Trade, Industry and Competition (DTIC); DMRE; National Treasury	Policy formulation, regulation, and funding frameworks	National strategic direction
Provincial Government	Limpopo Department of Economic Development, Environment and Tourism (LEDET); Limpopo Department of Education; Limpopo Provincial Office of the Department of Employment and Labour; Limpopo Provincial Treasury; Limpopo Department of Cooperative Governance, Human Settlements and Traditional Affairs (COGHSTA).	Provincial planning, implementation coordination, and resource alignment	Provincial One Plan coordination
District and Local Government	District and local municipalities	Local economic development, community interface, spatial planning	District One Plans: geographic place-based implementation
Education and Training Institutions	TVET colleges, universities, and SETA-accredited private providers	Training delivery, curriculum development, learner support	Skills pipeline aligned to district needs
Industry and Employers	Large-scale mining companies, small-scale and emerging miners, contractors	Skills demand articulation, workplace learning, and employment	Demand-side input to One Plans
Labour Representation	Organised labour unions	Worker advocacy, training needs, and equitable skills access	Social partner coordination
Communities and Local Representation	Mining-affected communities; Ward Councillors; CBOs/NGOs/NPOs	Community needs articulation, local participation	Community voice in district planning
Enterprise and Youth Agencies	Youth employment and enterprise development agencies	Employability, entrepreneurship, enterprise support	Economic inclusion objectives
Private Sector and Partners	Private firms; development partners	Co-funding, innovation, reskilling initiatives	Leveraging non-state capacity

5.6.3. Potential Partnerships across the System

The findings highlighted significant potential for strengthened partnerships across four core domains: industry, education, government and community structures. Currently, engagement between these domains is uneven, with limited evidence of sustained, structured collaboration.

Industry-education partnerships were identified as particularly weak, constraining curriculum responsiveness, access to workplace learning and alignment between training provision and

occupational demand. Similarly, coordination between skills authorities and local planning structures was limited by centralised decision-making and aggregated data, reducing responsiveness to district-specific labour-market dynamics. Capacity constraints at the municipal level further limited the integration of skills development into local economic development planning, particularly in rural and mining-affected areas.

Despite these constraints, comparative insights from other provincial contexts illustrate the value of embedding skills intelligence within regional economic and workforce planning structures. More systematic use of sector-focused skills analysis, employer engagement platforms and shared labour-market intelligence has supported stronger alignment between skills supply, funding decisions and priority growth sectors. While contextual differences remain, these practices provide a relevant reference point for strengthening partnerships and evidence-based planning in Limpopo.

5.6.4. Stakeholder Influence, Interest and Collaboration Risks

The analysis of stakeholder influence and interest, see Table 18, indicated that actors with the greatest strategic influence also carry the highest risk if they are weakly engaged. Where coordination is limited, risks include misalignment between training provision and labour-market demand, fragmented implementation, outdated curricula, and limited progression from training into employment or self-employment. Community-level stakeholders, while often having lower formal influence, were shown to have high levels of interest and play a critical role in programme uptake, relevance, and access.

The effectiveness of collaboration across the skills system was generally perceived as neutral to weak. Inter-institutional coordination was reported to be stronger within sectors than across them, with the absence of a formal cross-sectoral coordination platform identified as a key barrier. Monitoring of impact was largely limited to learner tracking, with insufficient emphasis on employment outcomes, occupational mobility or longer-term socio-economic impact.

Table 18: Stakeholder influence

Stakeholder Group	Level of Influence	Level of Interest	Key Contribution	Key Risk if Weakly Engaged
National Skills Authorities (SETAs)	High	High	Funding, skills intelligence, programme design	Misalignment between training and demand
Provincial Government	High	High	Strategic coordination, resource alignment	Fragmented implementation
District and Local Government	Medium	High	Place-based delivery, community interface	Poor localisation of skills initiatives
Industry and Employers	High	Medium–High	Demand signals, workplace exposure	Skills mismatch; weak absorption
Education and Training Institutions	Medium	High	Training supply, curriculum	Outdated or misaligned provision
Labour Representation	Medium	Medium	Worker perspectives, equity	Low buy-in; limited impact
Communities/ Ward Councillors	Low-Medium	High	Local needs, access barriers	Exclusion; poor uptake

Enterprise and Youth Agencies	Medium	Medium	Transition to work/self-employment	Training without progression
Private Sector Partners	Medium	Medium	Innovation, co-investment	Missed scaling opportunities

5.6.5. Strengthening Partnerships Through Skills Intelligence and Coordination

Strengthening partnerships within the Limpopo skills ecosystem requires a deliberate shift from fragmented, compliance-driven interaction towards a functional system in which stakeholders understand and actively fulfil their respective roles across planning, implementation and absorption stages. While collaborative skills audits and shared labour-market intelligence are essential tools, their effectiveness is contingent on consistent participation, data-sharing and commitment from all stakeholders involved. Without such engagement, even well-designed analytical instruments risk becoming procedural exercises with limited practical impact.

At a system level, skills authorities are responsible for providing credible labour-market intelligence, funding frameworks, and coordination mechanisms that enable alignment across sectors and regions. Government structures at the provincial and local levels play a vital role in integrating skills development into economic planning, spatial development, and service delivery processes, ensuring that skills interventions respond effectively to place-based realities. Education and training institutions are tasked with maintaining curriculum relevance, updating programmes to meet changing demands, and working closely with employers to secure workplace-based learning opportunities. Employers, in turn, are central to articulating demand, offering exposure and absorption opportunities, and supporting progression through workplace learning, mentorship, and employment pathways. Community and labour structures contribute essential insights into access barriers, equity considerations, and local priorities, supporting the uptake and relevance of interventions.

Skills audits, when embedded within the overall ecosystem, function as a shared diagnostic and coordination mechanism rather than a standalone technical exercise. Their value lies not only in identifying priority occupations and skills gaps, but in enabling collective decision-making on funding allocation, programme sequencing and implementation responsibilities. However, where stakeholder participation is weak, data is withheld, or planning processes are treated as compliance obligations, audits are unlikely to translate into meaningful change.

From a systems perspective, effective partnership strengthening therefore depends on clear role definition, mutual accountability and formalised coordination platforms that connect skills planning with economic development and labour-market outcomes. Improving the functioning of the skills system in Limpopo will require sustained leadership, incentives for collaboration and a shared commitment to translating analysis into coordinated action across industry, education, government and community structures.

6. KEY FINDINGS AND IMPACT ANALYSIS

6.1. Summary of Key Findings

The study confirms that Limpopo possesses a wide and diverse skills development ecosystem, comprising universities, TVET colleges, private colleges, MQA-accredited centres and community-based training programmes, yet access to training and workplace learning remains unevenly distributed across districts. Skills infrastructure and institutional capacity are overwhelmingly concentrated in Capricorn and Vhembe, where both public universities and the majority of private and SETA-accredited providers are located. In contrast, Waterberg, Mopani, and Sekhukhune, despite being the backbone of mining, energy, and agriculture, experience limited institutional coverage and weaker access pathways, particularly in rural municipalities far from Polokwane, Thohoyandou and Tzaneen. These geographic disparities profoundly affect human capital development in the province. Rural and mining-affected communities face high transport costs, long distances to training centres, limited placement opportunities, and insufficient information about available programmes, resulting in weakened participation in the post-school education and training system. Consequently, even when training is available, many individuals struggle to translate educational attainment into employment, income generation or sustainable livelihood pathways.

From a theoretical standpoint, the Limpopo case reinforces that investment in human capital alone does not guarantee labour-market returns. Human capital only yields meaningful employment outcomes when supportive systems, such as workplace learning access, labour-market absorption capacity, and aligned economic opportunities, are in place. Evidence from WSP analysis, SSP comparison, and focus group inputs highlights persistent systems-level coordination weaknesses, including fragmentation across providers, misalignment between training supply and labour-market demand, lack of district-level differentiation and limited integration between skills planning, local economic development (LED) strategies and industrial activity.

The data further reveals that skills development in Limpopo remains predominantly supply-driven, shaped by compliance requirements, budget cycles and existing programme offerings rather than granular labour-market intelligence. WSP submissions reflect immediate operational needs, particularly in PGM mining, chrome mining and coal-to-energy operations, but these needs are largely replacement-driven, not oriented towards diversification, emerging sectors or local enterprise development. In districts with limited employer presence, such as parts of Waterberg and Mopani, the weak labour-demand environment further diminishes the ability of training interventions to facilitate sustainable careers.

Overall, the findings confirm that labour-market mismatch in Limpopo is rooted in systemic constraints rather than in the absence of training activity. When training provision is uneven, curricula are not updated regularly, workplace learning is scarce, and local industries are not well integrated with skills planning, the system struggles to translate human capital

investment into improved employment outcomes or poverty reduction. Addressing challenges requires a cohesive, place-based skills ecosystem closely aligned with provincial development priorities, mining-community needs, and emerging economic opportunities linked to the JET.

6.2. Skills System Impact Analysis

6.2.1. Alignment

At a strategic level, there is broad alignment between national skills legislation, SETA mandates, Limpopo's provincial development priorities and the types of skills interventions implemented in the province. MQA-supported programmes are widely regarded as highly relevant to the operational needs of Limpopo's mining and minerals sector, particularly in technical production roles, occupational health and safety, environmental compliance and engineering-related functions. Cross-SETA analysis also reveals convergence across multiple sectors around key occupational categories such as electricians, millwrights, diesel mechanics, engineering managers, production supervisors, SHEQ practitioners and administrative support roles.

However, alignment weakens at the implementation level, where training provision is not consistently informed by district-specific labour-market intelligence, employer absorption capacity or local value-chain opportunities. Instead, provision is often shaped by legacy programmes, institutional capacity and regulatory compliance. This limits the system's responsiveness to emerging economic activities in Limpopo, such as renewable energy in Waterberg, agricultural value-addition in Mopani and Vhembe, mining-related digitalisation in Sekhukhune, and green-economy growth opportunities in mining-affected communities.

Moreover, while several institutions deliver relevant qualifications, alignment across the learning pathway remains inconsistent. Artisan, technical and engineering pathways often lack sufficient placement, mentorship and trade-test support, reducing throughput and limiting the supply of qualified artisans needed in high-priority occupations.

6.2.2. Skills Gaps and Systemic Constraints

A clear set of interlinked skills gaps continues to constrain workforce development in Limpopo, particularly in sectors integral to the provincial economy such as mining, agriculture, construction, logistics, and the emerging green-energy value chain. The most prominent shortages remain concentrated in artisanal and technical occupations, including electricians, millwrights, diesel mechanics, fitters and turners, instrumentation technicians, rock drill operators, mining supervisors, environmental officers and safety practitioners, many of which appear consistently as hard-to-fill vacancies across multiple SETAs. These shortages stem in part from a structural disconnect between the availability of theoretical training (e.g., N1 - N6 and NC(V) programmes) and the far more limited availability of recognised trade testing facilities, workplace placements and structured mentorship opportunities. The result is a

provincial labour force in which many individuals have partial or incomplete skills profiles that do not meet employer requirements or enable progression into certified trades.

Compounding these challenges are spatial inequalities and financial barriers that restrict access to high-quality training, especially in rural and mining-affected regions such as Waterberg, Mopani and Sekhukhune. While Capricorn and Vhembe districts host the majority of universities, TVET colleges and private technical providers, many rural communities face long travel distances, inadequate transport infrastructure, and limited information about available programmes. These conditions disproportionately affect youth and NEET groups, limiting their ability to access skills aligned with local economic opportunities. Emerging skills gaps in digital literacy, data systems, environmental rehabilitation, renewable-energy technologies and green compliance further highlight the need for adaptive, future-oriented training pathways that can support economic diversification beyond traditional mining. Taken together, these systemic constraints explain why Limpopo continues to experience the coexistence of high unemployment and persistent skills shortages, despite substantial training activity occurring across the province.

6.2.3. Systemic Constraints

The coexistence of high unemployment alongside persistent skills shortages highlights deep systemic constraints within Limpopo's skills development system. Despite broad policy alignment, the system remains fragmented, with weak coordination between SETAs, training providers, employers, municipalities and provincial departments. Skills planning is often compliance-driven and insufficiently informed by district-level labour-market intelligence, resulting in training provision that is poorly aligned with local economic conditions and absorption capacity. Limited workplace placement opportunities, outdated training infrastructure, insufficient equipment and fragmented articulation between TVET colleges, private providers and universities further undermine system efficiency. These weaknesses disrupt learning pathways, reduce throughput in high-demand occupations and weaken the translation of training into sustainable employment outcomes, particularly for youth and NEET populations.

6.3. Implications for MQA Strategy and Planning in Limpopo

The findings highlight the need for MQA to expand its strategic role beyond just funding disbursement and become a key coordinating player in Limpopo's skills ecosystem. While MQA programmes are well aligned with the operational needs of the mining and minerals sector, especially in safety compliance, artisan training, community skills development, and entry-level programmes, more effort is needed to improve the coherence and effectiveness of the entire skills pipeline. This involves supporting integrated learning pathways, updating curriculum content to match advancing mining technologies, and helping providers deliver high-quality, accredited programmes that meet current labour market demands. Strengthening MQA's role as a convener is crucial for unifying fragmented planning efforts

and ensuring district-level skills feed into programme design, funding decisions, and partnerships.

A major opportunity lies in strengthening access to workplace learning, trade testing and practical exposure, persistent bottlenecks limiting progression from theoretical learning into certified artisan occupations. MQA can play a pivotal role by brokering partnerships between employers, TVET colleges, private providers and municipalities to expand placement opportunities, modernise workshops and facilitate access to trade test centres. Expanding support for recognition of prior learning (RPL), mobile trade testing units, and employer-based mentorship could further accelerate the transition of semi-skilled individuals into fully qualified artisans, helping address Limpopo's chronic shortages in electrical, mechanical, instrumentation and mining-specific trades.

At the same time, the MQA strategy must adapt to the evolving skills landscape shaped by the JET, digitalisation and the increasing importance of green skills. Renewable-energy projects in Waterberg, environmental rehabilitation initiatives across the province, and the growing use of digital and automated systems in mining require new occupational pathways that cut across traditional sector boundaries. This creates an opportunity for MQA to collaborate more closely with EWSETA, CHIETA, AgriSETA and Services SETA to support joint programmes, aligned curriculum standards and cross-sector mobility pathways. Embedding digital literacy, environmental compliance, energy-efficiency practices and green technology competencies within existing mining programmes will strengthen labour mobility and support long-term economic resilience in mining-affected communities.

Finally, improving system coordination and strengthening data-driven planning must be central to the province's skills strategy. MQA can enhance the quality and utility of WSP data by supporting employers to report accurately at the district level, strengthening labour-market intelligence systems, and promoting shared monitoring frameworks that track learner progression into employment. Improved alignment between MQA funding decisions, district economic development priorities and cross-SETA skills intelligence will enable more targeted investment, reduce duplication and enhance the overall effectiveness of skills development in Limpopo. By adopting a more integrated, place-based approach, MQA can help ensure that skills development becomes a driver of inclusive growth, employment creation and community resilience across the province's diverse economic regions.

7. CONCLUSIONS

This study set out to evaluate the skills development landscape of the MMS in Limpopo Province, with a focus on assessing current and emerging skills demand and supply, analysing systemic alignment across institutions, and determining the implications for MQA's provincial mandate. The consolidated evidence from the literature review, WSP analysis, policy review, stakeholder engagements and quantitative survey findings confirms that the skills challenge in Limpopo is systemic and structural rather than the result of insufficient training provision alone. While Limpopo remains a nationally significant mining hub, particularly in PGMs, coal, diamonds and copper, its labour absorption capacity is being reshaped by mechanisation, technological change, commodity cycles, and the province's gradual economic diversification. Consequently, the skills system must adapt to balance continued operational needs in the MMS with new requirements linked to digitalisation, automation, environmental management and cross-sectoral economic transitions.

Aligned with the first study objective, the province's mining industry is revealed as a mature but evolving sector characterised by replacement demand, increasing technical skills intensity, and limited prospects for large-scale employment growth. Persistent shortages remain concentrated in engineering and artisan trades, plant and machine operations, instrumentation, occupational health and safety, and supervisory roles. At the same time, new opportunities are emerging in renewable energy, environmental rehabilitation, digital systems, agricultural value chains and local enterprise development. These shifts underscore the importance of a district-differentiated, evidence-led approach to skills planning that reflects Limpopo's unique spatial economy, where opportunity-rich, urbanising nodes contrast sharply with rural and mining-affected communities facing barriers to access, weak infrastructure, and limited workplace exposure.

Regarding the objective of assessing alignment between skills provision and labour-market demand, the study concludes that while national, provincial and sectoral policies generally converge around key priorities, alignment weakens during implementation. Skills development in Limpopo remains unevenly distributed, heavily supply-driven, and poorly integrated with district labour-market realities. TVET colleges, private providers and universities operate in silos and struggle with outdated equipment, limited practical training facilities, and insufficient work-integrated learning placements. As a result, human capital investment does not consistently translate into employment outcomes, confirming the relevance of Labour Market Mismatch Theory and the systemic constraints highlighted in the theoretical framework. Without stronger coordination and clearer articulation pathways, education and training efforts cannot fully respond to the evolving skills profile of the MMS or support workforce mobility across emerging sectors.

In addressing the third objective, identifying gaps and constraints, the evidence shows that systemic weaknesses, rather than isolated programme failures, underpin labour-market mismatch in the province. These include limited access to accredited trade testing, persistent gaps in workplace learning, insufficient responsiveness of curricula to technological change,

and weak communication between employers, SETAs, government entities and local communities. Spatial inequality further restricts participation: most high-quality training provision remains concentrated in Polokwane, Tzaneen, Thohoyandou and Mokopane, leaving outlying areas in Sekhukhune, Vhembe and Mopani at a disadvantage. Mining-affected communities also emphasised limited awareness of available programmes, inconsistent employer engagement and high costs associated with training access.

Finally, the study affirms that MQA's strategic role in Limpopo extends beyond funding discrete programmes to stewarding an integrated and demand-led provincial skills ecosystem. This includes strengthening the coherence between WSP evidence, provincial development priorities, occupational demand, and district-level socio-economic realities. It requires improving system coordination across SETAs, enhancing workplace learning and trade-testing pipelines, investing in rural and community-proximate training capacity, and expanding opportunities for reskilling into agriculture, construction, manufacturing, logistics and the green economy. Given Limpopo's unique combination of deep mining reliance and an evolving diversification pathway, the MQA must play a central role in supporting both mining sustainability and economic resilience through inclusive skills development.

In conclusion, the study demonstrates that improvements in employment outcomes, productivity and socio-economic well-being in Limpopo will depend on the degree to which human capital investments are embedded within a cohesive, responsive and future-oriented skills system. When institutional coordination, spatial equity and labour-market alignment are strengthened, skills development can act as a powerful lever for transition, mobility and inclusion. Conversely, if systemic fragmentation persists, training investments, no matter how substantial, will struggle to produce meaningful, sustainable impact. These insights form the foundation for the recommendations that follow, aimed at enabling the MQA, provincial partners and industry stakeholders to build a more integrated, agile and locally responsive MMS skills ecosystem that supports long-term provincial development.

8. RECOMMENDATIONS

This section translates the study’s conclusions into SMART, actionable recommendations aligned to the MQA mandate and the provincial skills development context of Limpopo Province. Recommendations are structured across four levels: strategic (MQA level), provincial skills planning, programme and funding interventions, and partnerships and ecosystem strengthening. Each recommendation identifies responsible actors, specific actions, timelines and the system constraint addressed.

8.1. Strategic Recommendations (MQA Level)

At a strategic level, the findings highlight the need for the MQA to strengthen its role as a system steward within Limpopo’s MMS skills ecosystem. Beyond funding and compliance oversight, the MQA is well positioned to coordinate skills intelligence, align planning instruments, and support demand-led skills pathways that reflect provincial, district and sectoral realities.

Table 19: Strategic Recommendations

Recommendation	Responsible Actor(s)	Specific Action	Timeline	Scope Addressed
Strengthen MQA’s role as Limpopo MMS skills system coordinator	MQA (Head Office & Limpopo Regional Office)	Establish a Limpopo MMS Skills Steering Forum comprising MQA, key SETAs, provincial departments, major mining employers and TVET representatives	Within 6 months	System coordination; labour-market mismatch
Strengthen demand-led skills planning	MQA	Introduce mandatory provincial and cross-sectoral skills alignment checks for Limpopo WSP submissions before discretionary grant approval	Next WSP cycle (12 months)	Skills relevance; alignment
Improve spatial and district-level skills intelligence	MQA	Investigate district-level skills levels and needs in at least two mining-affected districts (e.g. Waterberg and Sekhukhune) using WSP, SSP and community data	Pilot within 18 months	Spatial equity; access
Improve monitoring of outcomes beyond training	MQA	Introduce Limpopo-specific post-training outcome tracking (placement, trade testing, progression) for MQA-funded programmes	12 months	Employability; accountability

8.2. Provincial Skills Planning Recommendations

Provincial findings confirm that skills development in Limpopo is constrained by spatial inequality, limited access to training infrastructure in rural districts, and weak integration between skills planning and provincial economic development initiatives. Addressing these constraints requires stronger alignment between provincial planning instruments, the District Development Model (DDM), and SETA-driven skills systems.

Table 20: Provincial Skills Planning Recommendations

Recommendation	Responsible Actor(s)	Specific Action	Timeline	Scope Addressed
Integrate MMS and transition skills into provincial planning	Limpopo Provincial Government; MQA	Embed MMS, green economy and transition skills priorities into provincial economic and spatial development plans	12–24 months	Provincial alignment
Strengthen rural and mining-community access to skills	Provincial Government; District Municipalities; MQA	Identify district-based training hubs and expand mobile, blended and satellite delivery models	18 months	Equity; rural access
Improve provincial skills intelligence sharing	Provincial Government; SETAs	Develop a shared Limpopo Skills Intelligence Dashboard drawing on SSP and WSP data	12 months	Evidence-based planning
Strengthen DDM-aligned skills planning	District municipalities; MQA	Integrate skills priorities into District Development Model implementation forums	12–24 months	Place-based planning

8.3. Programme and Funding Recommendations

Programme-level analysis shows that skills provision in Limpopo remains short-course and compliance-driven, with weak progression into trade certification, employment or self-employment. Funding must therefore prioritise end-to-end learning pathways, particularly for artisanal, technical, digital and transition-oriented skills.

Table 21: Programme and Funding Recommendations

Recommendation	Responsible Actor(s)	Specific Action	Timeline	Scope Addressed
Prioritise full artisan and technical pathways	MQA; training providers	Allocate increased discretionary funding to end-to-end artisan pipelines (training, workplace exposure, trade testing)	Next funding cycle	Critical skills shortages
Expand reskilling for economic diversification	MQA; partner SETAs	Co-fund reskilling programmes in renewable energy, agriculture, construction, environmental rehabilitation and manufacturing	12–24 months	Transition pathways
Strengthen digital and green skills integration	MQA; TVET colleges; universities	Embed digital literacy, automation and green competencies into MMS-related programmes	12–18 months	Future skills
Improve funding accountability for outcomes	MQA; employers	Link grant funding to measurable progression outcomes (placement, trade testing, entrepreneurship)	Immediate–12 months	Employment outcomes

8.4. Partnership and Ecosystem Recommendations

The study confirms that Limpopo’s skills challenges are ecosystem-wide, requiring stronger collaboration across SETAs, employers, training institutions, municipalities and communities. Sustainable impact depends on improving coordination, information flows, shared accountability and access to workplace learning opportunities.

Table 22: Partnership and Ecosystem Recommendations

Recommendation	Responsible Actor(s)	Specific Action	Timeline	Scope Addressed
Strengthen industry–training linkages	Employers; training providers; MQA	Formalise workplace learning, mentorship and equipment-sharing agreements	12 months	Work readiness
Enhance cross-SETA collaboration	MQA; other SETAs	Establish annual joint planning forums for cross-cutting skills (digital, OHS, green skills)	Annual	Systems coordination
Improve community awareness and access	Municipalities; community structures; MQA	Implement structured community engagement mechanisms to improve programme awareness	Ongoing	Inclusion; access
Support local enterprise and SMME skills	MQA; Limpopo municipalities	Integrate entrepreneurship and business skills into technical training for mining-affected communities	12–24 months	Local economic resilience

8.5. Overall Recommendation Summary

Collectively, these recommendations are SMART, actionable and achievable within existing institutional and policy frameworks. They position the MQA as a system steward in Limpopo, strengthening coordination, improving alignment between skills supply and labour demand, and supporting both operational mining continuity and economic transition. Implemented together, they provide a practical pathway to reducing labour-market mismatch, improving employability outcomes, and enhancing inclusive, place-based skills development across Limpopo Province.

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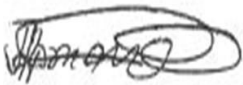
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