

# **Opportunities and Challenges for a Just Transition in the Free State province and Gert Sibande and Nkangala districts in Mpumalanga province**

## **DRAFT REPORT**

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SUBMITTED BY: ADAPT

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# 1 INTRODUCTION

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The Just Transition in South Africa is an urgent policy agenda around which multiple actors have coalesced, including public sector actors across sector departments and levels of government, civil society – notably labour – business, and others. The Just Transition policy agenda is a response to the vulnerabilities, costs and risks that emerge and are unequally distributed in the process of low-carbon transition (McCauley & Heffron, 2018; Heffron, 2021; McCauley, et al., 2019). In South Africa, as internationally, the Just Transition was driven by labour as an urgent push to address the vulnerability of workers who stood to lose employment and livelihoods as industries were pushed to comply with changing environmental compliance requirements (ILO, 2018). Gradually, given the multiple historical, current, and future vulnerabilities and inequality that emerge in the low-carbon transition, particularly the decarbonisation of energy sectors, this agenda has been broadened to consider a much wider range of issues, beginning with the affected communities and regions who are impacted by and depend on fossil fuel value chains and their decline. In South Africa, the Just Transition has been largely focused on the energy transition – itself a complex process, which includes:

- The scaling down of fossil fuel production and use in energy value chains (coal to power and coal to liquid fuels; coal use in industry; petrochemicals);
- The increase in renewable energy uptake (notably wind and solar at utility and non-utility scale); and
- The economic reconfiguration of value chains, employment, and local economies in response to both technological shifts.

The third of these interconnected processes is perhaps the most complicated and uncertain, and critical to integrating issues of justice into the management of the transition. This is not a small feat, given that coal plays a significant role in the economy (coal-fired power still stands at 73% of nominal capacity (37.9 GW) in 2020) and provides 87% of electricity generated (Calitz & Wright, 2021). As coal value chains come under pressure from market and policy changes, the role of energy in the broader economy is being reshaped by technological innovation and related governance changes. This multi-dimensional transition has significant implications for the energy-society interface, where the energy system connects with other societal systems through, for example, employment, supply chains, consumption/end-uses, and political processes. This means that not only workers, but local communities, small and large businesses, local governments, and others will be impacted by the coal phase-out.

South Africa's coal-dependent power sector developed interdependently with energy (and carbon) intensive industry. This includes mining, liquid fuels and chemicals production, and steelmaking. Infrastructure investment beyond electricity infrastructure – human settlements, roads, rail, and water – have also been shaped by the coevolution of mining, power and industry. Coal is also integral to household energy strategies. Nowhere is this more evident than in Mpumalanga Province, particularly in Nkangala and Gert Sibande Districts. Further, the economic and developmental impacts of the country's coal value chain shape migration, remittances, and secondary economic activities. With its position at the heart of the country's energy-economy, coal has also been embedded in the colonial and apartheid policies and structures that are reproduced in entrenched inequalities (income, wealth, access to infrastructure and services) and spatial divisions. This is an exacting context for a technical transformation, which distinguishes the country's pathway from Just Transition processes in the global north and continues to challenge the scope of the policy problem at hand. Despite the risks for workers, some labour actors have come to see the Just Transition as inclusive of opportunities for decent employment creation.

Internationally the labour movement, as well as intergovernmental bodies, have played a critical role in advancing this policy agenda. UN agencies, particularly the International Labour Organization (ILO), have continued to play a key convening role on issues of labour and the transition. In 2006, the Trade Union Assembly on Labour and the Environment was held at the United Nations Environment Programme (UNEP) headquarters in Nairobi, Kenya, on 15-17 January. "Labour and the Environment: A Natural Synergy" proposed the following definition of the Just Transition, "Process that predicts or assesses the social security and employment impacts of change on workers and communities due to social, economic and environmental factors, and then institutes a transition process to address these impacts" (United Nations Environmental Programme (UNEP), 2007). The ILO developed Just Transition guidelines in 2015, endorsed by all 187 Member States of the ILO and the representative Employers Organisations and Trade Unions in those 187 member states. These guidelines, which centre Labour in the Just Transition, still shape policy in this area.

A range of other actors, beyond labour and governments, have been engaged in the publication of thematic reports, case studies, and policy recommendations, which has been critical in shaping and driving the Just Transition agenda forward (ILO, 2018; Just Transition Research Collaborative, 2018). The Just Transition is often associated with the energy transition. However, it should be noted that several studies have been and continue to be directed at identifying the most vulnerable jobs across different sectors, both from the perspective of physical climate change impacts (in sectors including agriculture, tourism,

forestry, fisheries, and related), as well as considering the impact of transitioning towards a net-zero carbon emissions economy (i.e fossil fuel-related or energy and emissions-intensive sectors such as energy, industry or metals) (Just Transition Centre, 2017; IRENA, The European Commission, and ILO, 2018). Pragmatic political negotiations and financial solutions have also been developed and undertaken to facilitate Just Transition policy implementation in various countries, concentrated in recent years primarily in developed economies (Just Transition Centre, 2019; Agora Energiewende, 2016; Cameron et al., 2020).

Stakeholders in South Africa who advance a Just Transition have varying interests and demands for just processes and outcomes. As such, it remains a contested space as actors seek convergence of ideas, visions, and principles. The energy sector, particularly the decarbonisation of the country's electricity system as laid out in national policy is an immediate challenge with economy-wide implication. Employment in coal value chains, and the associated vulnerabilities of workers, (and the precariousness of the labour rights gains made by the unions) has been a central concern (COSATU, 2011). It is, therefore, an orienting focus in this document. However, given economic reconfiguration resulting from the coal transition, and the need for economic diversification, other sectors are also addressed.

Due to the efforts of the unions and civil society, Just Transition has been integrated into South Africa's climate policy framework since its inception in 2011 (RSA, 2011), including the White Paper, Nationally Determined Contributions, National Planning Commission and in the National Economic Development and Labour Council (NEDLAC). However, operationalisation of Just Transition as a policy is a far more recent phenomenon, and areas of contestation and capacity and resources challenges persist. President Ramaphosa secured a USD 8.5 billion climate finance deal (including grants, concessional loans and investment) at the 2021 United Nations Climate Change Conference (COP26), a significant but small start toward the estimated USD 300 billion needed to finance a Just Transition (Godinho, 2021). Unsurprisingly, the scope of a Just Transition for South Africa has been gradually expanded. Informed by climate, environmental and energy justice debates, Just Transitions planning has been broadened to encompass the legacy and transition risks that result from the energy system as it transforms. The complexity of a low-carbon transition is exacerbated by the fact that it is not the country's only contested transition. The democratic transition that began in the 1990s, perhaps most clearly indicated by South Africa's first democratic elections in 1994, held the promise of political and socio-economic inclusion for the majority of South Africans. A relatively recent report by the World Bank declared this broader political and socio-economic transition in South Africa "incomplete" (World Bank, 2018). Deep structural inequality, structural unemployment, high levels of extreme poverty, and fiscal underperformance are

characteristic of the country's economy as it grapples with its institutional and social inheritance. With its Gini Coefficient at 0.59 in 2016, South Africa is consistently ranked among the most unequal countries in the world, which is seen as one of the major hindrances to poverty reduction and inclusive economic growth and development (Bhorat, et al., 2016). In the South African context, with its multiple transitions underway, and history of severe economic exclusion and environmental degradation, transformational justice has also been added to procedural and distributional considerations, as a policy parameter for its energy transition (Montmasson-Clair, 2021).

Within this multi-stakeholder, multi-sector, multi-level transition process, it is imperative that policy coherence at a national level sufficiently enables other stakeholders to use their resources, capacities, and capabilities to implement the Just Transition. Yet in 2022, subnational government's challenges, risks and opportunities remain largely disconnected from the national processes that define the Just Transition, including the Presidential Climate Commission (PCC). It is critical to begin to support sense making more systematically, policy development and implementation, and investment at the provincial, district and local levels of government, in line with the Constitutional roles, powers, functions and potential that each of these governmental bodies has. Every Just Transition policy measure will be implemented in place, in a particular context, particularly informed by the following concerns:

- The coal value chain is concentrated in Mpumalanga (and to a lesser extent, the Limpopo and Free State Provinces), with undue exposure to legacy socio-ecological externalities associated with this value chain, as well as high exposure to transition risk.
- Different subnational regions have unique contexts, including economic, social and ecological assets and opportunities on which to build, grow and diversify local economies.
- Different administrations have different development ambitions, mandates, institutional capacities, capabilities, and resources to respond to promoting justice in the transition. Different administration also face unique challenges relating to their Constitutional mandates, overlapping or complementary responsibilities, and local service delivery needs.

The distinctive challenges in these different situations requires acknowledgement. Failing to grapple with urgent trade-offs or treating the national Just Transition as an homogeneous process is both impracticable and imprudent. Additionally, as noted in the report, subnational

governments (provincial, metropolitan, district and local) have a range of powers and functions that are essential for delivering key elements of Just Transition planning, implementation, and investment. These mandates include, but are not limited to, development planning, economic development facilitation, and service delivery, encompassing economic, social and environmental dimensions. Working at the provincial and district levels of government does not exclude other levels of planning. Rather, it enables much better integration from the community to the national level.

The National Planning Commission's (NPC) "Social Partner Dialogue for a Just Transition," clearly works with the appreciation of the importance of the subnational. It prioritised Mpumalanga and the Free State for immediate attention for Just Transition policy, planning and implementation (National Planning Commission, 2019). Given that the coal value chain is largely concentrated in Mpumalanga, evolving Just Transition work at the provincial level could be reinforced through institutional support for the provincial administration, and at the district and local levels. To date the Free State has received significantly less Just Transition focus and support. While the starting points for the two regions are quite different, there is a shared need to take stock of their respective challenges, opportunities, needs and risks as a basis for short, medium and long-term institutional responses.

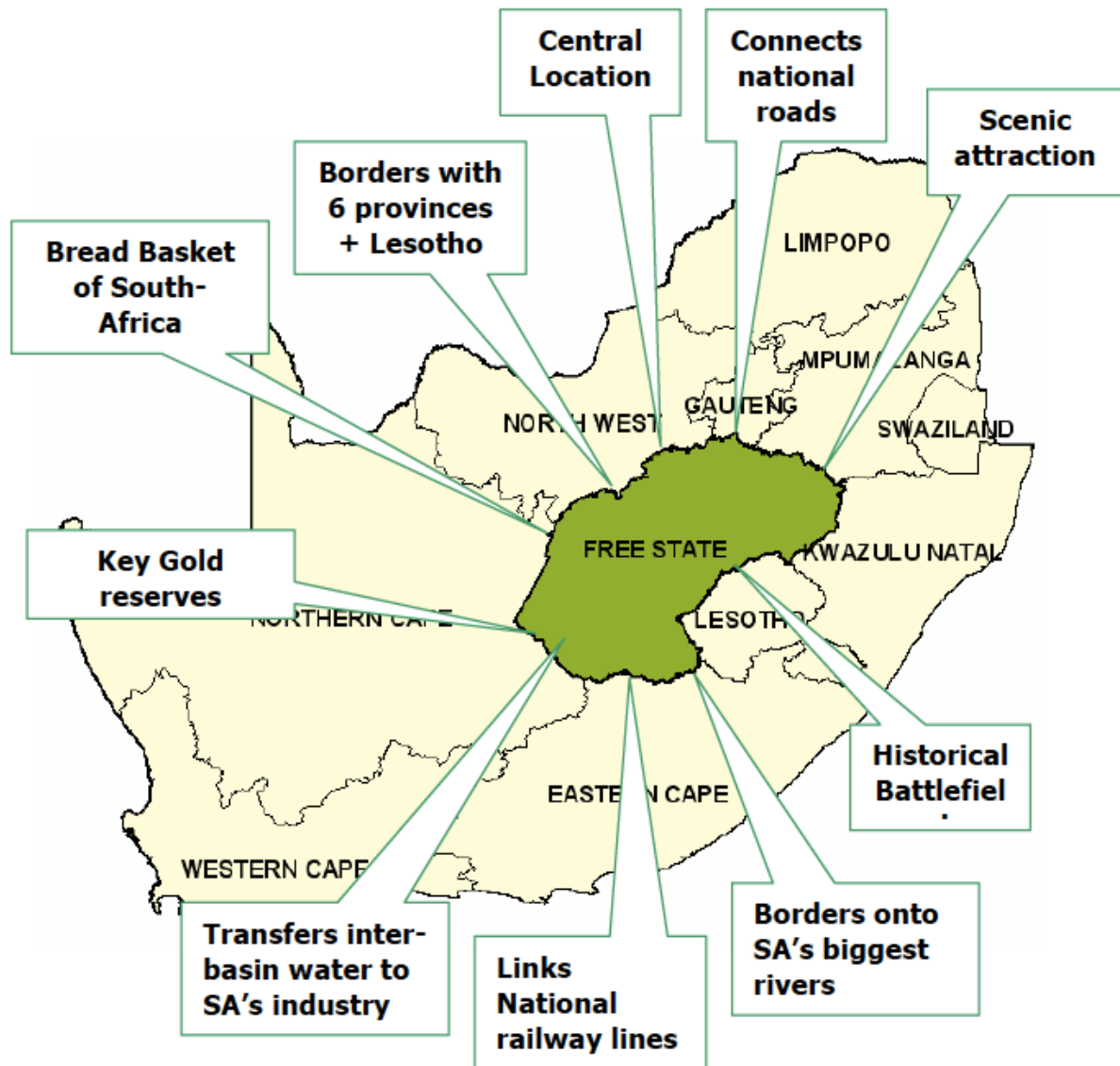
To this end, this document undertakes a rapid situational analysis of Gert Sibande and Nkangala District Municipalities in Mpumalanga province, and the Free State Province. It aims to define the challenges and opportunities for a Just Transition. It is a first step toward adequate Just Transition planning and implementation at the district and provincial levels. The intention is that the analysis and recommendations will inform a longer-term action planning process, institutionalisation thereof, and iterative implementation, with attention to priority sectors. The level of analysis informs the point of entry and boundary for investigation as well as the convening/authorising stakeholder (District and Provincial governments, respectively). The methodology followed incorporates the ILOs rapid situational analysis template, which also identifies Just Transition 'hot spots'. To this end, the research and findings will be high level and based on available desk top research and data with limited stakeholder engagement. In addition to assessing available data and examining existing work underway, this analysis also points to institutional requirements for planning and implementation beyond the drafting of plans for the Just Transition.

# FREE STATE

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## 2 PROVINCIAL OVERVIEW

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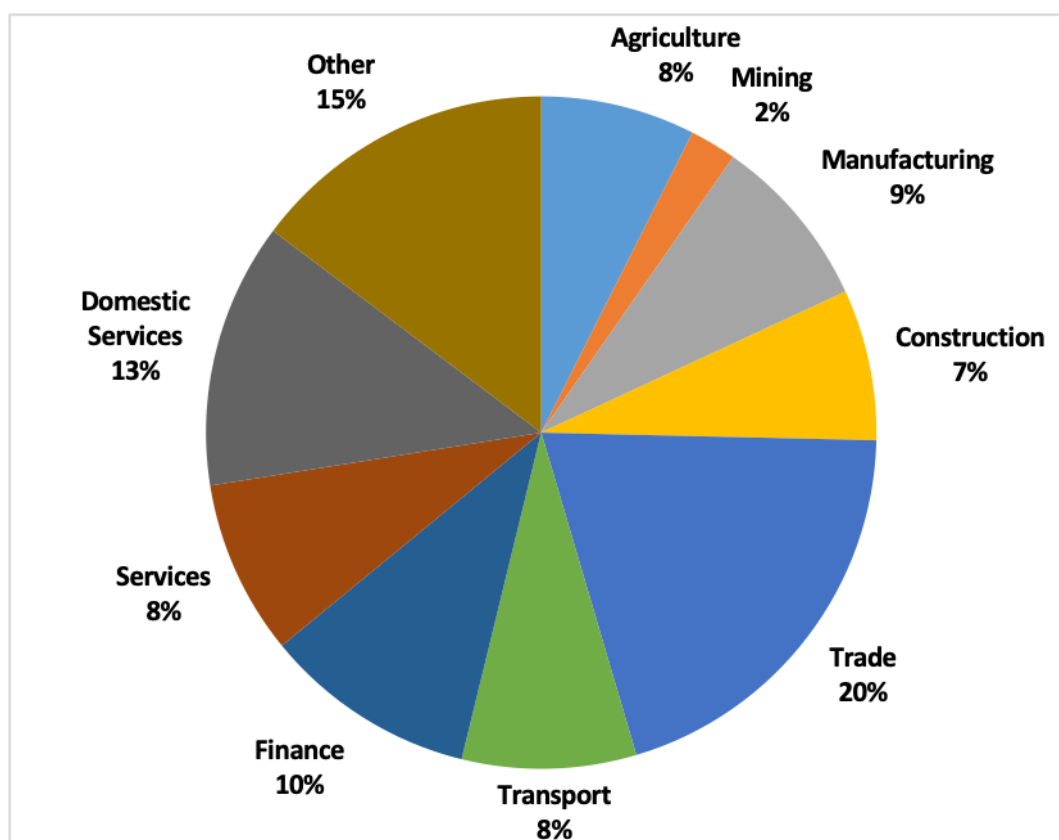


The Free State province is located at the geographical centre of South Africa and is the only province to be bordered by six of South Africa's nine provinces and the kingdom of Lesotho (Free State Provincial Government, 2013). Although the Free State province is the third largest province, comprising 10.6% of the country's land, it has the second smallest population. Its capital is Bloemfontein which is South Africa's judicial capital (destea, 2021).

The Free State economy is dominated by agriculture, mining, manufacturing. It is well known for its contribution to agriculture and has been referred to as the 'breadbasket' of South Africa with 90% of the province under cultivation for crop production (destea, 2021). It is also known for being the heart of the country's gold mining. Although the Free State mining sector is primarily made up of gold mining, coal and diamonds are also mined in the province (Urban-Econ, 2021). Figure 5.1 shows the employment share of industries in the Free State taken from Q1 and Q2 of the 2019 Quarterly labour force survey (Kerr, et al., 2020). The Trade industry is the largest employer (20%), followed by the domestic services (13%) and Finance (10%).

The Free State also has a large tourist industry with tourist attractions including the Golden Gate Highlands national park near Maluti Mountains, Basotho cultural village in QwaQwa national park, Bloemfontein botanical gardens, war memorials and monuments of the Anglo Boer war (Free State Provincial Government, 2013).

**Figure 2.1: Share of employment by sector in the Free State in 2019**



Source: authors calculations based on PALMS (Kerr, et al., 2020).

The province is made up of one metropolitan municipality, Mangaung, and four district municipalities, namely Lejweleputswa, Fezile Dabi, Thabo Mofutsanyana, and Xhariep.

The Mangaung Metropolitan Municipality (MMM) is located at the centre of the Free State and has seven towns including the capital Bloemfontein (MMM, 2020). In 2017 it had a population of 853 580 (MMM, 2020). Mangaung is the main contributor to the Free State economy with a 40% share of the Gross Domestic Product (GDP) of the free state (MMM, 2020). Of all the districts in the Free State, Mangaung Metropolitan Municipality had the highest Gini-coefficient, with an index value of 0.623, making this municipality acutely unequal (MMM, 2020).

In its recent 2021/2022 IDP update the acting executive mayor of Mangaung states in the foreword that the municipality needs to recover from its financial challenges, Covid 19 impacts and rapid urbanisation by providing an “integrated, coherent socio-economic development policy that strives to mobilise all of society towards a common developmental vision and mission”. The IDP attempts to align with key national documents such as the NDP and DDM initiatives and plans and identifies the following as KPA areas for work:

- Basic service delivery and infrastructure development;
- Good governance and Public participation;
- Local Economic Development;
- Institutional Development and Organisation;
- Transformation;
- Financial viability

Lejweleputswa District Municipality has 5 local municipalities and is home to 22% of the province’s population, 627 626 people. It is the heart of the goldfields, with the town of Welkom developing around gold mining in the 1930s. Mining makes up 24% of the GVA of the district and is the major employer (Urban-Econ, 2021). Additionally, the town of Bothaville is one of the key maize centres in the country (MMM, 2020). This District Municipality contributed 15% to the GDP of the Free State in 2018 (MMM, 2020). Despite these, 62% of people in this district are said to be living in poverty and whilst gold mining is in decline at least two gold mine reserves are still expected to have a long-life span.

Fezile Dabi District Municipality, with 4 local municipalities and 16 urban areas containing a population of 523 724 in 2017, is an agricultural centre dominated by maize and produces the

majority of the country's cherries (MMM, 2020). The district municipally is the second largest contributor of the Free State generating 24.51% of the provinces GDP in 2018 (MMM, 2020). The economy of Fezile Dabi relies heavily on manufacturing industries which make up 34% of the districts GVA (Urban-Econ, 2021). It is in the Vaal catchment area and gets most of its water from the Vaal dam. It also houses the Sasolburg synthetic fuel plant which dominates the manufacturing contribution of the district.

Thabo Mofutsanyana District Municipality has 6 local municipalities with population of 736 238 and is considered an important tourism destination with the golden gate highlands national park. Thabo Mofutsanyana has the highest poverty rate in the province with 68.1% of its population living in poverty (MMM, 2020). Despite housing one of the largest dams in the country the district is experiencing one of the most sever water shortages in the country. It is also home to the only special economic zone in the province, which is halfway between Durban and Johannesburg in Harrismith. Qwaqwa also has and industrial park that was formerly dominated by the clothing and textile sector and it is owned by the FDC.

Xhariep District Municipality it is a semi-arid grasslands area with 3 local municipalities and 20 small towns. It is the smallest district with a population of 146 259, only 5,2% of the province, but a large agricultural sector used for livestock (MMM, 2020). The largest dam in South Africa, the Gariep Dam, is located at the southern tip of the district municipality (MMM, 2020). The district boarders both the Northern Cape and the Eastern Cape and has high solar radiation after Northern Cape, thereby presenting opportunities for solar farming plants.

### 2.1.1 Population

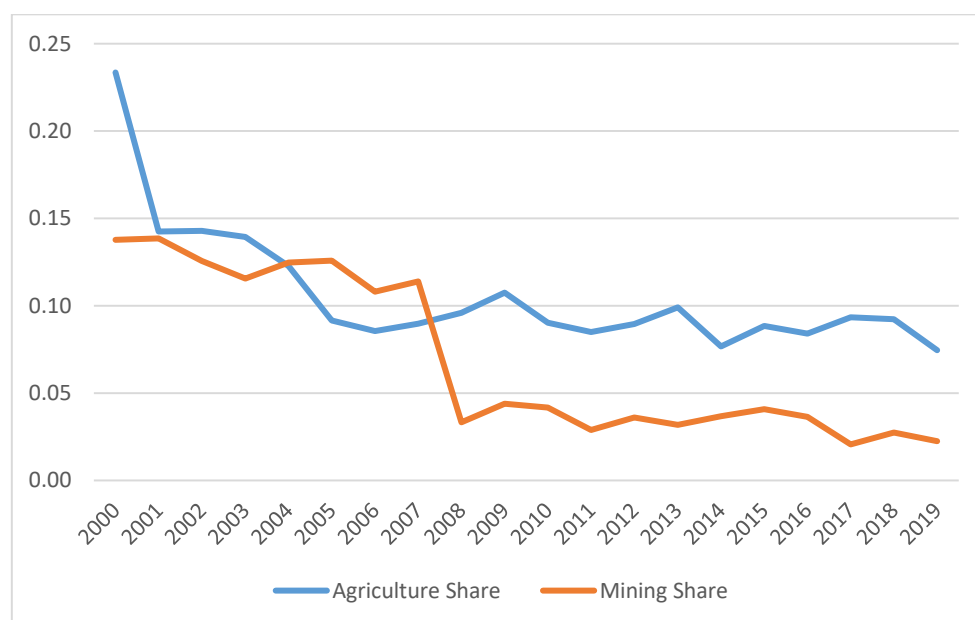
Based on data from the 2016 StatsSA community survey the Free State had a population of 2.8 million people which was an increase of 3,7% from 2,7million in the 2011 census (Urban-Econ, 2021). Data from the General Household Survey (GHS, 2020) show that the population increased to 2.917 million in 2019 (Statistics South Africa, 2020). Unsurprisingly the greatest growth in population levels was in the metropolitan city of Mangaung.

### 2.1.2 Urbanisation

The Free State is urbanising, a trend that is country wide as people move from rural areas to cities in search of better work and living opportunities. The province has a low share of former "homeland areas" only 9% of the population lived in these areas in 2015 compared to 27% for the country as a whole. The share of employment in the agricultural and mining sector has

been on a decline for the past 20 years, as can be seen in figure 5.6 below. This decline in employment has displaced many workers in rural areas in the Free State which resulted in rapid rural-urban migration.

**Figure 2.2: Declining share of agriculture and mining employment in the Free State**



Source: authors calculations based on PALMS (Kerr, Lam & Wittenberg, 2019).

There are 236 informal settlements in the Free State and the majority fall within Lejweleputswa municipality. Across the province those living in informal settlements, 26% do not have access to toilet facilities, 63% do not have access to electricity for lighting and 55% do not have access to refuse removal by local authorities. 34% of household heads in informal housing were under 35 years of age compared to 20% of those in formal housing. 30 000 free state households living in informal housing had at least one member of the household on the waiting list for RDP housing (Housing Development Agency, 2012).

### 2.1.3 Unemployment

The Free State suffers from high levels of unemployment particularly youth unemployment. Table 1 shows that the official unemployment rate was 33.4% in the fourth quarter of 2020 which decreased by 1.6 percentage points compared to 2019. This decrease was, however, largely the result in a decrease in unemployment for the 45-54 and 55-64 age groups. Unemployment for the younger age groups increased, and the unemployment rate for the 15-24 age group sat at 62.4% in 2020 (Free State Province Department of Treasury, 2021).

**Table 2.1:Free State official unemployment rate by age group**

Age Category	Oct-Dec 2019	Jul-Sep 2020	Oct-Dec 2020
15-64 years	35.0	35.5	33.4
15-24 years	61.9	58.3	62.4
25-34 years	45.2	43.8	45.2
35-44 years	25.9	33.9	32.2
45-54 years	21.0	23.1	14.6
55-65 years	14.6	7.5	9.4

Source: Statistics South Africa, Quarterly Labour Force Survey,  
2020: Q4 (Free State Province Department of Treasury, 2021)

While there is a gender employment gap in the province statistics from the 4<sup>th</sup> quarterly labour review of 2020 show that this gap is slowly closing with an increase in female employment and a decrease in male employment in the province (Free State Province Department of Treasury, 2021).

#### 2.1.4 Poverty and inequality

43.1% of households in the Free State were living below the upper-bound poverty line<sup>1</sup> in 2015. This was an increase from 2011 poverty levels (StatsSA, 2017). A report from the Mangaung Metropolitan Municipality (2020) shows that poverty levels increased further from 2015 levels. The report shows that Mangaung has the lowest poverty rate in the province, with 51.6% of their population living below the upper-bound poverty line in 2018 (MMM, 2020). The average household income was under R80 000 per annum According to the 2015 General Household Survey, while the median household income in the Free State was R3 000 per month, compared to R3 260 nationally. In the relatively small former “homeland” regions, however, it was only R1 000 a month, somewhat accounting for why 25% of households rely on social grants (Stats SA, 2017).

#### 2.1.5 Health

80% of the Free State's population does not have access to private medical aid and rely on the state for health care services (Malakoane, et al., 2020). However, the public health system in the Free State is inadequate and has been worsened by the COVID-19 pandemic (Ritshidze Free State, 2021). A study by Malkoane et al. (2020) finds that fragmentation of health

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<sup>1</sup> The Upper-bound poverty line is defined by Stats SA as the minimum amount required to purchase both adequate levels of food and non-food items. This was defined to be a per capita income of R992 per month in 2015 (Stats SA, 2017)

services, staff shortages, and cash-flow problems are the main issues contributing to ineffective public health services in the Free State. A report by Ritshidze Free State (2021) finds that shortages of staff has resulted in poor quality care and long wait times. This has resulted in fewer people in the province being tested for HIV and TB (Ritshidze Free State, 2021). The leading causes of death in 2017 were Tuberculosis, hypertensive disease, HIV, and acute respiratory illnesses such as pneumonia (Statistics South Africa, 2018). The leading causes of infant mortality in 2017, cases of children below one year are high, was respiratory and cardiovascular disease (18.3%), pneumonia (7.8%) and intestinal infectious disease (5.7%) (Statistics South Africa 2018). A climate vulnerability assessment of the human health sector in the Free State states that sewage spills that are polluting rivers and the declining air quality due to the processing of petrochemicals and industrial and household burning of fossil fuels are significant challenges in the Province that are putting the health of communities at risk (destea, 2017).

#### 2.1.6 Environmental

Variability in climate conditions is already being observed in the Free-State, which has been experiencing prolonged drought, heat waves and severe floods in some parts of the province (destea, 2021). The effect of increased temperatures and climate uncertainty is already having devastating effects on the economy of the free state. Droughts and heat waves have especially had an impact on the agricultural sector. Drastic climate change impacts are expected by the turn of the century with increased temperatures resulting in more severe climate variability. The impacts of climate change, biodiversity loss, water scarcity and pollution all pose a great threat to local ecosystems.

Water security is a major concern as climate change and increasing climate variability threatens to exacerbate the already strained water resource. The Free State is highly dependent on its water resource due to its large agricultural sector which provides both food security and employment. Prolonged drought since 2015 has resulted in some areas declaring a state of disaster on multiple occasions (Agri SA Research, 2021). Large portions of the available water resource in the Free State are affected by pollution. River water quality is degraded due to fertilizer from agricultural activities, human waste from insufficient sanitation services, and mining activities. The Lower Orange will be extremely vulnerable to temperature change, as temperatures in this catchment are expected to increase at twice the national rate (destea, 2021). This will place further demand on irrigation and water availability and quality will be compromised due to the accumulation of salts and evaporation rates. In the Vaal, divided into lower, middle, and upper catchments, rainfall is expected to increase or remain

unchanged, and mean annual temperatures are expected to increase marginally. Climate variability will impact on rainfall and runoff in the catchment and extreme rainfall events are expected to occur in some parts. These changes will impact on agriculture the most, as irrigation requirements will increase, and the costs of water will rise. Due to this water scarcity, many farmers and small towns have become increasingly dependent on ground water which is starting to be over extracted (DARD, 2019). Subsistence farmers will be affected differently in part due to the fact their yields are much smaller but their production is likely to be reduced. Climate change projections for the province indicate increases in temperatures and a reduction in the amount of rainfall which will reduce the availability of surface and ground water in the province. This will result negatively on the agricultural sector and will result in an increase in the costs of meeting water demand by municipalities for consumers (DARD, 2019).

The agricultural sector in the province is particularly at risk of climate change (destea, 2021). The effects of climate change have already begun to be felt in this sector, with drought and heat waves resulting in a drastic reduction of field crops. Heat waves in various small towns in the Lejweleputswa District Municipality, where it is no longer possible to plant maize, have caused the wheat crops to suffer severe quality and yield loss. This situation is made worse due to a lack of credit available to commercial farmers which has meant that many farmers are unable to invest in climate adaptive technologies. In some areas increased temperatures may result in the expansion of the sorghum crop (destea, 2021).

Healthy and diverse ecosystems are critical for human wellbeing including food and fresh water. Biodiversity of the region is under pressure, and in some cases decimated, due to mining, large scale agriculture and urbanisation. The three biomes found in the Free State are grassland (making up 72% of the province), the Nama-Karoo (22%) and the Savannah (5.2%) (destea, 2021). The grassland biome is the one of the most threatened biomes in the country, under all climate scenarios. The 'bioclimatic envelope' for grasslands will be significantly reduced and is most likely to be overtaken by savanna and forest vegetation. There are 40 ecosystem types in the Free State, excluding forests, and many are vulnerable or endangered, as are various species of birds, mammals, and insects. Wetlands and rivers are vulnerable natural resources, with 48% of wetland ecosystems in the province being classified as critically endangered, largely due to pollution. River water quality is degraded due to fertilizers and agricultural activities (destea, 2021).

## 2.2 FREE STATE DIAGNOSTIC

### 2.2.1 Institutional assessment

**Table 2.2: Departments that provide information for status quo assessments**

Department/Sector	Information / Documents Provided and Initiatives currently underway
Planning Department	Integrated Development Plan (IDP) 2014
Transport	Integrated Public Transport Network (Draft document): Public transport initiatives to ensure safe, efficient and affordable public transport, towards reshaping of public transport in South Africa and ultimately introducing priority rail corridors and Bus Rapid Transit (BRT) systems in cities.
Human Settlements	Human Settlements Plan Build Environment Performance Plan (BEPP): Green interventions undertaken on a project basis, e.g. Electricity saving initiatives, insulation, heat pumps, etc.
Centlec SOC Ltd	Policies and/plans documents to be provided: Electricity Distribution, e.g. 3 Solar Farms operational within the Municipality (Centlec to confirm)
Engineering and Infrastructure	Guidelines/Standards for provision of services (Red Book) Master Plan (Volumes 1&2): Bulk Storm Water & Roads
Water and Sanitation	Red Book 1. MMM currently experiencing bulk water shortage, to source from Gariep dam 2. Design of infrastructure takes into account rainfall statistics. 3. Infrastructure is designed to withstand 20yr, 50yr and 100yr floods
Local Economic Development (LED) Department	Economic Development Strategy (2003) Green Economy Framework Energy Efficiency Strategy Job creation / SMME development Cleaner technologies
Environmental Management	Economic Development Strategy (2003) Green Economy Framework Energy Efficiency Strategy: Job creation / SMME development Cleaner technologies
Land Use	Land Use Management Planning Tribunal
Disaster Management	Disaster Management Plan Mangaung Risk and Vulnerability Assessment Study Report: 1. Disaster management plan in place 2. Early warning systems available 3. Disaster Management Centre
Finance	Medium Term Revenue and Expenditure framework (MTREF) 2015/16 – 2017/18: Budgets allocated for developmental and environmental related programs, disaster management, etc

GIS and Planning	Spatial Development Framework (SDF) - Spatial Maps: .Supporting an efficient movement system; 2.Supporting sustainable Environmental Management; 3. Initiating and implementing Corridor Development; 4.Managing Urban Growth and densification; 5.Delineating an urban development boundary; and 6.Development of strategically located land.
Architect	Outline of water and electricity saving initiatives: Green building design initiatives currently underway
Waste Management	Waste management initiatives at MMM: 1. Construction of Transfer Station in Thaba"Nchu (with a component of waste sorting system to divert waste from the landfill sites 2. Constructions of 3 Buy- Back centres in the 3. regions of MMM 3. Pilot project on separation of waste at source in one suburb. 4.Planning is underway for waste drop-off sites

Source: Taken from climate change adaption and mitigation strategy for Mangaung Metropolitan Municipality (NM Envirotech Solutions, 2015)

The Municipalities of the Free State are in the midst of a financial crisis. Most of the local municipalities are facing severe liquidity challenges with outstanding debtors reaching alarming levels (DCGTA, 2021). There is an absence of cost reflective tariffs, large distributional losses through theft and illegal connections, and weak implementation of debt collection policies. As a result, to quote Mr.T. Nxangisa, "the financial crisis that Municipalities in the Province (the Free State) face has developed into a calamity" (Nxangisa, 2020). The municipalities incurred even more credit with Eskom and the Water board in 2020. In total the Free State Municipalities owed ESKOM R13.52 billion and Bloem Water and Sedibeng Water Board R5.64 billion by the end of 2020. The Department of Cooperative Governance and Traditional Affairs (DCGTA) annual performance report consistently sights unauthorised and irregular spending as root causes for debt and adverse audit outcomes (DCGTA, 2021). Illegal connection and theft resulting in large distributional losses, prolonged drought, and collapsing infrastructure and service delivery utilities adds further to the financial crisis facing the province (DCGTA, 2021).

The audit outcomes of the local municipality's points to leadership and internal control challenges. None of the Free State Local Municipalities received a clean audit and only 4 (out of 23) received an unqualified audit, meaning free of material errors or omissions (DCGTA, 2021). The Maluti-A-Phofung local municipality in the Thabo Mofutsanyana District has not submitted its financial statements for the past two years and has been subject to repetitive section 139 interventions (Parliament of the Republic of South Africa, 2020). This authorises

provincial executives to intervene in the municipality as it has not met its executive obligations. The Maluti-A-Phofung local municipality also owes R5.74 billion to ESKOM, which is more than 40% of what is collectively owed to ESKOM by the entire province (DCGTA, 2021).

Local Municipalities in the Free State struggle to deliver basic services such as electricity, water, and sanitation to communities. Poor service delivery was exacerbated by the increased pressure of the Covid-19 Crisis. This has contributed to widespread non-payment of municipal bills and service delivery protests (DCGTA, 2021). While the annual salary bill of municipalities has escalated, no budget allocation and limited support staff is often sighted as a major challenge affecting the effectiveness of Municipal Public Accounts Committees (Nxangisa, 2020; DCGTA, 2021).

Infrastructure is of a poor quality and much of it is old and replacement of infrastructure would be a further financial burden to the state. The maintenance of infrastructure is a prominent issue in the Free State which sits at the core of poor service delivery. Use of rail lines have declined in conjunction with the decline in mining. There has been a lack of investment overall in infrastructure build and repair, which has been linked to an overall decline in public sector investment since the late 1970s (DCGTA, 2021). The challenge of infrastructure maintenance is affected by a lack of capacity in the infrastructure departments, inability to collect revenue and poor debt collection (DCGTA, 2021).

Capacity of the state is lacking, and this is exacerbated by constant changes in leadership as well as high vacancy rates (DCGTA, 2021). Further different sets of legislation across and within spheres of government are not always aligned, and thus helpful in ensuring a common provincial vision. Many of the municipal Integrated Development Plans (IDPs) lack strong strategic direction. Given budget and financial constraints the IDPs tend to be more good intentions than plans that can be implemented to support development outcomes. Planning processes have also, in general, lacked the ability to create new partnerships between government and social partners in order to foster growth and development (Free State Provincial Government, 2013). Like many municipalities across the country, they lack human and financial resources. In part this is related to the way in which municipalities have to generate revenue in order to undertake their developmental mandate which is challenged. Further a lack of monitoring and evaluation impedes implementation and delivery.

**Table 2.3: non-climatic factors that increase vulnerability in MMM**

Poverty	Unemployment	Old and dilapidated houses
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Source: Taken from climate change adaption and mitigation strategy for Mangaung Metropolitan Municipality (NM Envirotech Solutions, 2015)

The state has plans to improve service delivery with support of municipal infrastructure technical services which provided support to 9 local municipalities in 2019/2020 (Nxangisa, 2020). Their goal is to build technical capacity in struggling municipalities, unlock funding on procurement processes, improve oversight and accountability (Nxangisa, 2020). The economic reconstruction and recovery plan was developed by the end of 2020 as a response to the devastating impact of the Covid-19 pandemic on local economies. The plan aims to assist in economic rebound through massive roll out of infrastructure, rapid expansion of energy generation, employment stimulus and the drive for industrial growth (DCGTA, 2021).

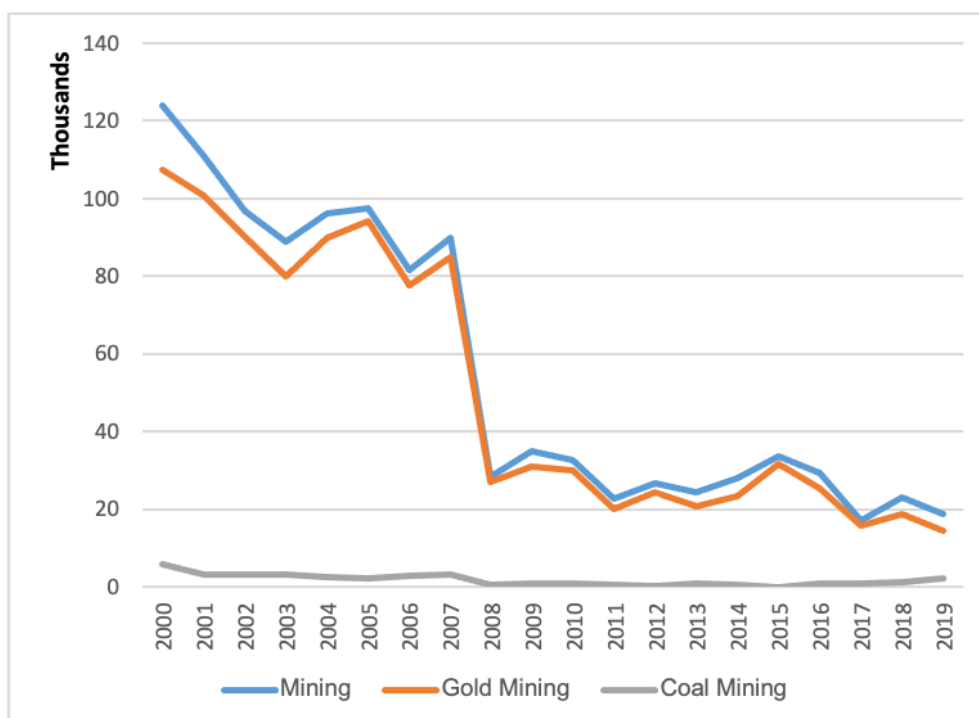
Implementation, monitoring, and evaluation are important in terms of recognition of institutional arrangements being key to implementation. This should assist in the coordination and facilitation of interactions between the spheres of government and collective action by all stakeholders. They suggest setting up a Free State planning commission to oversee implementation and coordination.

Plans should reflect shared vision and drive implementation.

- Municipal debt burden affects economic growth of the region
- Aging infrastructure
- Poverty needs
- Service delivery protests seen as due to lack of communication and institutional capacity issues
- Need for greater awareness and education

As the global demand for gold has declined many goldmines have closed in the last 30 years and mining employment in SA has dropped from 550 000 people in 1986 to 110 000 in 2018 (Sesele, et al., 2021). The majority of workers in the Free State mining sector are employed in the gold mining sector, evident in figure 5.3 below (Urban-Econ, 2021). The main gold mining areas are in Lejweleputswa District Municipality which contains the two main gold mines in the province (Urban-Econ, 2021). The mining industry in the Free State has been declining since 1990, there is little prospects for further exploration and a lack of skilled labour such as engineers in the sector leading to vacancies. Poor water supply in mining communities adds to the challenges facing the mining sector.

**Figure 2.3: Employment trends in the Free State mining sector (2000-2019)**



Source: authors calculations based on PALMS (Kerr, et al., 2020).

It is important to recognise that mine closure has reinforced gender inequity. “The mining industry has placed a double burden on women, firstly because the historically low employment levels of women in the industry prevented gender equality in mining societies, and secondly because mine decline and closure may affect women disproportionately” (Sesele et al. 2021). Many women are pressurised to find employment to support their families with little opportunities.

After democracy policy relating to mining focused on diversifying ownership and management, labour legislation, environmental protection and health and safety. Whilst the 1998 White Paper on energy recognised even then that gold mining was on the decline and that it would impact on jobs and have other knock-on effects, it did not really offer solutions. It emphasised the need to consult with the work force and put much of the responsibility onto local government through their IDPs and local economic development plans. It assumed local government both had the funds and capacity to manage this transition. In addition, the closure plans should have commenced even at the point of the mines opening. The planning for this

is long term and expensive and having plans in place at the outset could have impacted on some of the environmental and social impacts mining had.

The White paper also encouraged mines to develop social plan funds to manage the closures and downscaling. This was followed by the Mineral and Petroleum Resources Development Act of 2002 which required mining companies to develop closure and social and labour plans. According to Marais (2013) there is little guidance within plans on government's role nor mention of gender and the impact and consequences on women in mine closure. Where there are SLPs in place they generally do not align with most IDPs meaning that there is little coordination. Further SLPs only last as long as the mine is open and many impacts can occur long after closure (Marais, 2013).

There remains little institutional capacity at the local level of government to deal with mine closure (Marais, 2013). Many mine towns were subsidised and serviced by the mining companies when this situation changed municipalities were to take over that function. Many have not succeeded in achieving this due to institutional, governance and infrastructure problems. The negative impacts of mining last for many years and therefore there are no quick solutions. The SLPs were supposed to support local municipal IDPs and provide for the communities but many were simply licences for mines and mine owners.

It is evident that despite the knowledge that gold mining was on the decline planning was inadequate which has impacted on employment and decent work. Similarly, the impact of climate change on the agricultural sector is significant. More details on the economy are broken down in the next section looking at the sectoral analysis.

From a Just Transition perspective there appears to be no current provincial frameworks in place nor in process. There is an overall need to look at institutional, governance, finance and transition to a low carbon economy from a holistic perspective.

## 2.3 THE ECONOMY: SECTORAL ANALYSIS

**Table 2.4: Free State Employment by Sector (2011 – 2019)**

	2011		2015		2019	
Industry	Employment	Share	Employment	Share	Employment	Share
Total Employed	790564	-	822510	-	835198	-
Agriculture	67194	0.085	72795	0.089	62263	0.075
Mining	22788	0.029	33632	0.041	18801	0.023
Manufacturing	63200	0.080	69411	0.084	70169	0.084

Electricity	1534	0.002	5947	0.007	4971	0.006
Refining	4005	0.005	665	0.001	6033	0.007
Iron and Steel	844	0.001	1397	0.002	2626	0.003
Trade	172004	0.218	177720	0.216	167483	0.201
Construction	69276	0.088	56594	0.069	60609	0.073
Transport	63200	0.080	69411	0.084	70169	0.084
Finance	70549	0.089	65612	0.080	85680	0.103
Services	63200	0.080	69411	0.084	70169	0.084
Domestic Services	90136	0.114	88870	0.108	106620	0.128

Source: authors calculations based on PALMS (Kerr, et al., 2020). Note: figures are taken as the averages of 4 waves of the QLFS.

### 2.3.1 Agriculture

The agriculture sector is one of the most unequal sectors in South Africa with varying degrees of vulnerability depending on the relative ability to adapt to the climate crisis. Agriculture is essential to the well-being of the Free-State. It is a major employer contributing substantially to the Free State economy and is a main contributor to food security not only for the province but for the country, making up more than 14.5% of South Africa's commercial farming (destea, 2021). Agriculture accounts for 90% of land use in the Free State compared to 7% which is used for settlements. Mixed farming accounts for 54%, crop farming 17.7% and animal farming 23.9% of commercial agriculture (DARD, 2019). Main agricultural produce includes maize, soybeans, wheat, sorghum, sunflowers, potatoes, cattle, and sheep but the region also produces some fruit and vegetables (destea, 2021).

The total commercial income in agriculture for the province was R46.9b in 2017, which accounted for 9.36% of the gross value added. The three strongest contributing municipalities were Thabo Mofutsanyane (36,3%), Lejweleputsiwa (24,9%) and Fezile Dabi (24,2%) (Statistics South Africa, 2017). Table 5.4 Shows that by 2019 10532 jobs have been lost in the agricultural sector compared to 2015, which marked the start of the prolonged drought period in the free state.

Currently the agricultural sector in the province is subject to severe drought conditions. The lowest annual rainfall in 112 years was recorded in 2015 (DARD, 2019). The Free State economy and Southern Africa was also devastated by El Nino<sup>2</sup> which resulted in below average rainfall patterns/ droughts and was the hottest years ever recorded in 2016. The

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<sup>2</sup> El Niño is a climate pattern that describes the unusual warming of surface waters in the eastern tropical Pacific Ocean. El Nino is the "warm phase" of a larger phenomenon called the El Nino-Southern Oscillation (ENSO). <https://www.nationalgeographic.org/encyclopedia/el-nino/print/>

effects of the drought and extreme heat resulted in reduced crop yields and a reduction in revenue for the province. The province has yet to recover from this prolonged drought with the dam levels decreasing by a further 12.79% in 2019 compared to the previous year. Midsummer droughts are still seriously affecting all districts (Agri SA Research, 2021). This has resulted in a drastic decrease in summer crops as well as farmers being forced to slaughter large numbers of animals due to lack of natural feed and increased feeding cost (DARD, 2019).

The current drought has highlighted the gravity of the agricultural sectors dependency on rainfall and water availability needed for irrigation resulting in a drastic reduction in crop yields across the province (destea, 2021). This in turn increased unemployment as farmers were required to lay off their workers. For many of farmers the drought has meant foreclosure by the banks (Agri SA Research, 2021). Moreover, due to the prolonged drought, many disaster declarations and no aid from the government, the value of the land has decreased, with it the collateral value from which credit for production of crops can be lent (Agri SA Research, 2021).

Occurrence of drought is expected to increase in coming decades (DARD, 2019). Rainfall variability is a threat to agriculture within areas impacted by different seasonality and differing quantities of rainfall (destea, 2021). This makes these areas more at risk and sensitive to changes in the climate (destea, 2021). Another critical factor when it comes to agriculture is temperature, of which affects a number of agricultural processes (destea, 2021). With the anticipated increase in temperatures and decrease in water availability, crop yields are expected to be negatively impacted, with decreases of up to 25% for maize and wheat predicted (destea, 2021). Already there is food inflation because of drought and further increases are expected (DARD, 2019).

Agriculture in Mangaung is one of the key economic activities with both commercial, small scale and subsistence farming being practised. As a livelihood, an estimated 46 172 households, a percentage of 19,4% of the total households in the municipality depended on agriculture activities in 2011, with a combination of crop farming and livestock. Crop farming is the most dominant in Mangaung, accounting for 67.5% of the agricultural activities, followed by livestock farming, mixed and lastly other types of agriculture (Stats SA, 2011). The agricultural households earned income ranging from R4 801.00 to R38 400, per year, while a less percentage of households did not manage to get an income from agriculture. Other agricultural activities include poultry, horticulture (mainly vegetables), bee keeping, and aquaculture (NM Envirotech Solutions, 2015). Evidence is available that highlights that smallholder and subsistence dryland farmers are more vulnerable to climate change

compared to the commercial farmers who depend on large scale irrigation which is in turn is dependent on the availability of rainwater. While irrigated agricultural production is probably least vulnerable to climate change, this is premised on the provisional availability of sufficient water supply for irrigation.

Droughts Rainfall patterns are likely to be increasingly variable, thus affecting the supply of clean, fresh water. This in turn can compromise hygiene and increase the risk of diarrhoeal disease (WHO, 2013). In extreme cases, water scarcity results in drought and famine. It has been predicted that, by the 2090s climate change is likely to widen the area affected by drought, double the frequency of extreme droughts and increase their average duration six-fold (Arnell, 2004 in WHO, 2013). Floods have also been increasing in frequency and intensity, contributing to contaminated freshwater supplies, a heightened risk of water-borne diseases and breeding grounds for disease-carrying insects such as mosquitoes. Physical hazards from floods include drowning and physical injuries, damage to homes and disruption in the supply of medical and health services (WHO, 2013). The combination of increased temperatures and variable precipitation contribute to a decrease in the production of staple foods which will increase the prevalence of malnutrition and under-nutrition (NM Envirotech Solutions, 2015).

### 2.3.2 Water

The Free state is a water stressed province and faces many challenges regarding water management, especially in the agricultural sector (destea, 2021). The province has access to water supplies from within the region including the Orange and Vaal rivers, 9 of South Africa's largest dams but also relies on water brought in from other water management areas including Lesotho.

In 2016 municipal access to piped water was at 96% and 84,5% of households had access to safe drinking water. Of these households 69,9% with access to piped water did not experience water interruptions (StatsSA, 2016). Given agriculture plays an important role in the economy of the province, water is in demand, 52% of annual water use is used for irrigation. Thus, any water insecurity will have an impact on the crops grown in the area.

Despite this the province has experienced severe water shortages in the past due to drought and problems associated with poor water quality. The water resource of the Free State is significantly affected by pollution, particularly from mining and agriculture activities (destea, 2021). This has been exacerbated by poor municipal sewerage treatment works being discharged into the rivers leading to a deterioration in river and wetland health which has

further impacted on biodiversity. Mining and poor farming practices have further worsened these problems.

Ground water is an essential resource in the province and is used in rural areas and in towns where surface water is insufficient. The prolonged drought which has resulted in low dam levels has put increased pressure on ground water. The increased withdrawal of ground water has resulted in the drying up of many boreholes in various districts (destea, 2021). As precipitation is the main source of ground water, groundwater recharge and discharge are predicted to be affected by changes in rainfall and temperature (destea, 2021).

Water resources for the Mangaung consists of a series of dams, rivers, wetlands and groundwater resources. The municipality's water resources straddle between two water management areas, Upper Orange and the Middle Vaal water management areas, with 5 rivers found in the area, the Kaalspruit, Korannasspruit, Modder and Renosterspruit. A total of 2759 wetlands covering 15002ha (2.4%) of the municipality are considered part of the surface water ecosystem (NM Envirotech Solutions, 2015)

### 2.3.3 Energy

Energy generation is an important economic sector in the Free State (destea, 2021). Energy within the province is generated using a variety of methods, including "natural gas, methane, solar, and hydro power" (destea, 2021). The free state brings in a large sum of its electricity from coal power stations situated in Mpumalanga province through transmission lines (destea, 2021). This electricity is stored in substations within the free state province and disseminated out to end users via distribution lines (destea, 2021). The province also houses two hydropower stations at the Gariep and Vanderkloof Dam's with respective generation capacities of 360 MW and 240 MW (destea, 2021). Additionally, solar park projects are presently being carried out at the Letsatsi solar park situated north of Bloemfontein and in the Xhariep and Lejweleputswa district, with a generation capacity of 200 MW (energydesk.africa, 2022). Other solar parks are underway in Boshoff.

In table 5.4 we can see that 4971 individuals were employed in the electricity sector in 2019. While many of the districts have achieved impressive figures in electricity provisions, the non-payment of electricity has placed pressure on the municipalities to provide electricity, leading to huge debt burdens.

The free state province has large generation potential, with the Xhariep region having a solar radiation index that is second best in the country (destea, 2021). This presents extensive possibilities for the growth of the energy sector (destea, 2017). The province is also exploring investments in additional renewable energy solutions and products (destea, 2021). For instance, Eskom has been rolling out energy efficient equipment such as solar water geysers and panels (destea, 2021). Wind power is also being investigated as another potential energy source within the province (destea, 2021).

Climate changes presents several challenges for the energy sector. The predicted increase in temperatures will lead to increased use of energy for cooling, thus placing pressure on the current capacity of existing infrastructure for energy generation and supply (destea, 2017). Moreover, this predicted increases in temperature and extreme weather events such as flooding, and frost/ snow will affect the continuity of the provinces energy supply by damaging the infrastructure (destea, 2017). The income of households and businesses within the province will be negatively affected by this (destea, 2017). Likewise, the possibilities for renewable energy available to the province depend on changes in climate and their impacts. Water availability for hydro power generation may become inadequate due to increasing evaporation from the dams, rainfall variability and drought (destea, 2017).

#### 2.3.4 Transport

In 2015 the state of Road Transport was the largest consumer of fuels in the Free State, with the main sources of energy used in road transport being petrol and diesel. Road transport emissions contribute to poor air quality (particulate matter, oxides of nitrogen and other air pollutants). This sector is seen as being a priority area for expansion of infrastructure to facilitate access to transport services by those living in remote/rural areas (NM Envirotech Solutions, 2015).

