INFRASTRUCTURE
South Africa

GROWTH PERFORMANCE INDEX OF FREIGHT-INTENSIVE SECTORS IN THE WESTERN CAPE

A Technical Note

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INTRODUCTION

The purpose of this technical note is to analyse the performance of Gross Value Added (GVA) and employment and evaluate the effectiveness of the Growth Performance Index (GPI) and Employment Performance Index (EPI) as indicators of growth in the freight intensive sectors namely agriculture, forestry and fishing, mining and quarrying and manufacturing in the Western Cape (WC). The specific focus area will be as follows:

- Overview of the GPI;
- Historical analysis of rail and road transport;
- A regional overview of GVA across the freight intensive sectors for Western Cape;
- A regional overview of employment across the freight intensive sector for the Western Cape;
- An analysis and comparison of the GPI by district in the Western Cape;
- An analysis of the GPI by main sectors in the Western Cape;
- An analysis of the EPI by main sectors in the Western Cape;
- Conclusions.

The next section provides details on the discussion areas listed above.

OVERVIEW OF THE GROWTH PERFORMANCE INDEX

The Growth Performance Index (GPI) is used to determine if a particular sector from a region is performing above or below the standards of the same sector in the aggregate economy for the specified period (DBSA, 2001). For example, if there is an interest in learning how the agricultural sector in the Western Cape has performed in the last 10 years relative to the agricultural sector in the whole of the country, the GPI is calculated. The index is calculated using the real Gross Domestic Product (GDP) values for the region and the aggregate economy for the first and final years. In essence, the GPI compares the ratio of real GDP changes between the region and the aggregate economy. The ratio for the regional and aggregate economy are calculated as the final value divided by the initial value. The index is then simply the regional ratio divided by the aggregate ratio.

There are three general interpretations of the GPI value. A GPI **smaller than 100** suggest that the ratio in the aggregate economy is higher than the ratio in the region for the same sector, indicating that the sector in the region is **lagging** or **underperforming**. A GPI value **equal to 100** implies that the ratios of the real GDP values in the aggregate and regional economy are the same, which means the sector in the region is on the **same growth** rate as the aggregate economy. When the GPI value is **larger than 100** it indicates that the ratio in the aggregate economy is lower than the ratio in the region for the same sector, indicating that the sector in the region is **leading** or **overperforming**. Therefore, GPI can be used by policymakers at a **regional level** to see which sectors in the region have a **competitive advantage** and examine the performance of all sectors.

HISTORICAL ANALYSIS OF RAIL AND ROAD TRANSPORT

Rail and road freight each play their own special role in the transportation of goods and services in the country. For example, the road transportation network in the country is well-developed and links various cities and major ports. Rail transportation, on the other hand, is vital in the transportation of commodities emanating from the mining and quarrying and agriculture, forestry and fishing sectors. Unfortunately, the lack of maintenance and the deterioration of the rail network in the country has led to a switch from rail to road freight. The figure below provides a historical overview of the volumes of payload in tones transported by these two freight options in South Africa.

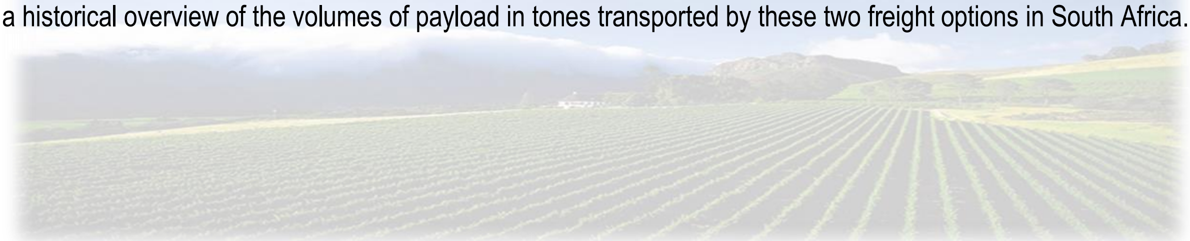
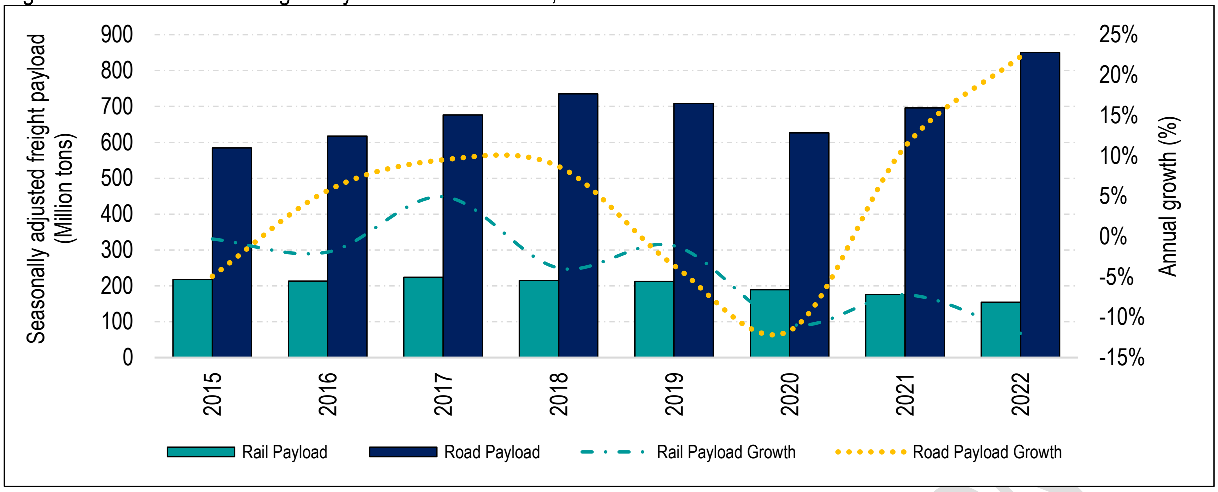


Figure 1: Rail and Road Freight Payload for South Africa, 2015 - 2022



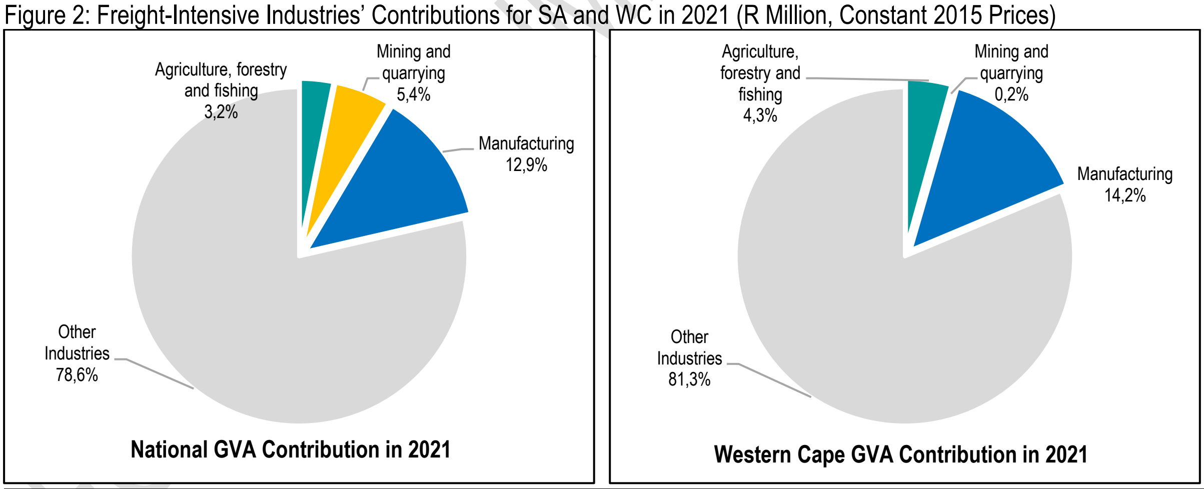
Source: Statistics South Africa (2023)

It is quite clear that road transport dominates rail, as seen by the tones of payload transported. In 2022, payload transported by road amounted to 851 million tons (a 22,3% increase from 2021) while in comparison rail payload was 155 million tons (a 12% decrease from 2021).

A REGIONAL OVERVIEW OF GVA ACROSS THE FREIGHT-INTENSIVE SECTORS FOR WESTERN CAPE

The freight-intensive industries contribute significantly to GVA in the country and in the Western Cape province, contributing about 21% for the country and almost 19% for the province in 2021. The figure below shows the contribution of each of the freight-intensive industries and includes a table showing the GVA value and Location Quotient for the province.

Figure 2: Freight-Intensive Industries' Contributions for SA and WC in 2021 (R Million, Constant 2015 Prices)



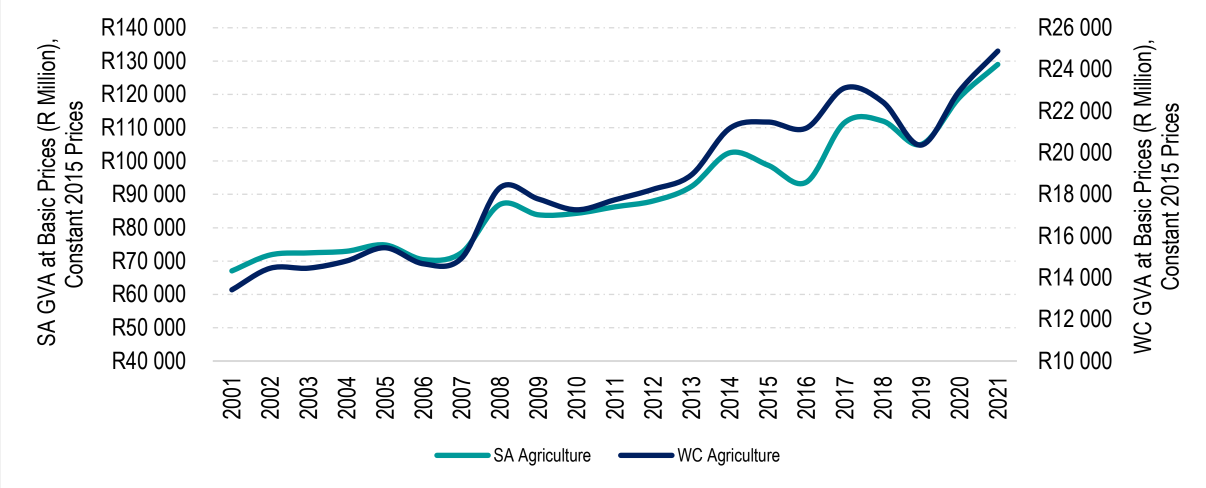
Western Cape Industries	GVA (2021, R Mil Constant 2015 Prices)	LQ Relative to National (2021)
Agriculture, forestry and fishing	R 24 879	1,36
Mining and quarrying	R 989	0,03
Manufacturing	R 81 935	1,10

Source: Quantec EasyData (2023)

The table shows that the province has a comparative advantage relative to the country in the agricultural industry as well as manufacturing. Each industry is discussed below for the province showing the GVA and growth trends leading to 2021.

The Western Cape economy is tertiary sector driven, which accounts for about 76% of the total GVA in the province. The primary sector contributed about 4,5%, which was mostly from the agriculture, forestry and fishing sector in 2021. The figure below shows the GVA for the agriculture, forestry and fishing industry in the Western Cape as well as in the aggregate economy.

Figure 3: Agriculture, Forestry and Fishing GVA for South Africa and Western Cape, 2001 - 2021

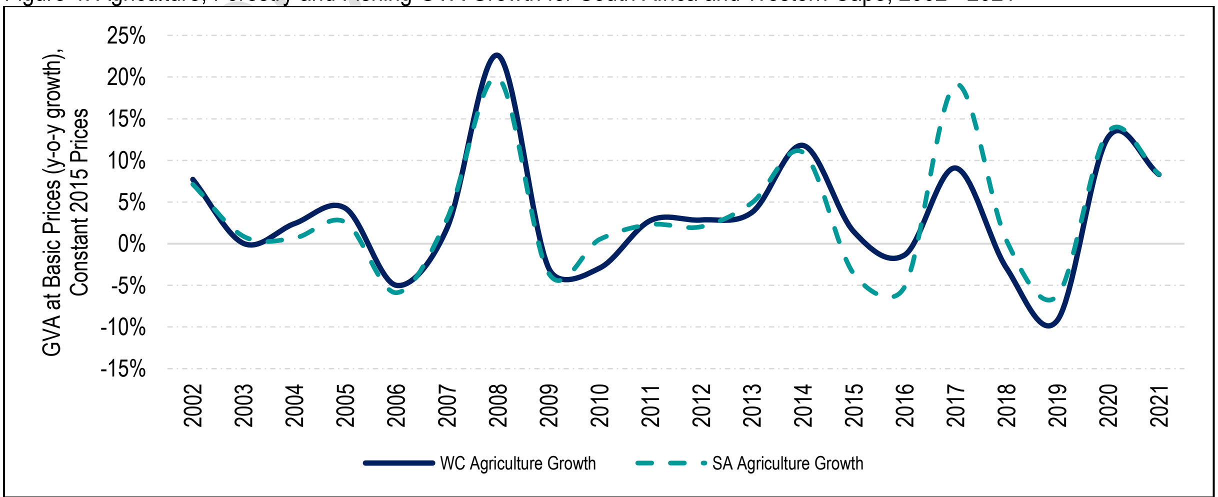


SOURCE: QUANTEC EASYDATA (2023)

Figure 4 shows that GVA for the agriculture, forestry and fishing industry for the nation, as well as the Western Cape province, has increased over the last two decades, with the country growing at about 3,33% per annum and Western Cape at about 3,13% annually over the period. The growth can be attributed to several factors, but it is important to highlight that the province has invested in agricultural research and development initiatives to enhance productivity, improve crop varieties, and develop innovative farming techniques also linked to the External Development Initiatives (EDI) (WC Department of Agriculture, 2022). This may have positively impacted export opportunities, particularly in the fruit and wine sectors, likely also increasing wine tourism in the province. These findings also highlight the importance of **infrastructure and logistics** that enable the **timely** and **cost-effective** movement of agricultural products from farms to domestic and international markets.

The growth trends for the agricultural, forestry and fishing industry for the country and the Western Cape province are shown in the figure below over the last two decades.

Figure 4: Agriculture, Forestry and Fishing GVA Growth for South Africa and Western Cape, 2002 - 2021

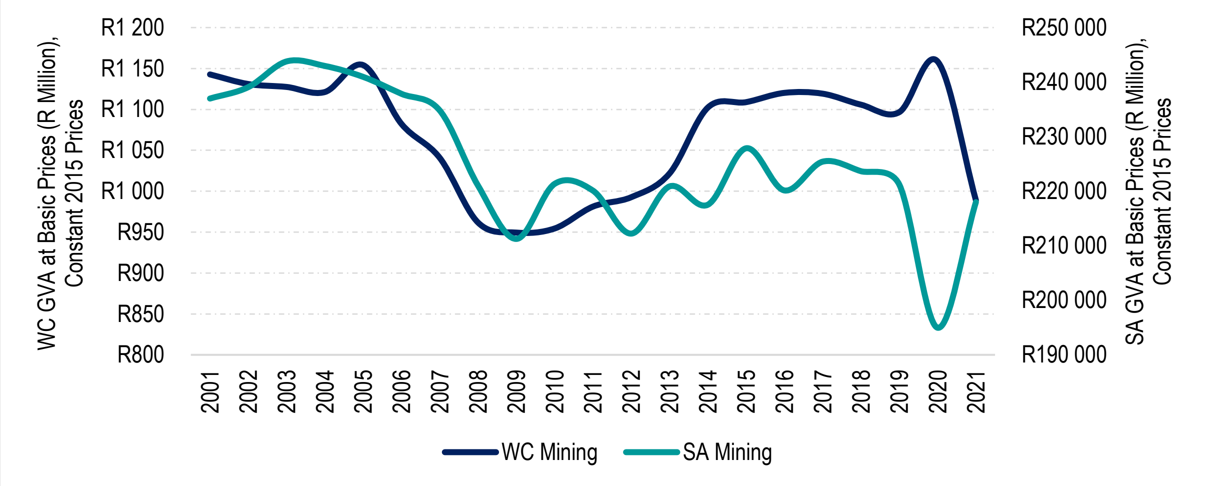


SOURCE: QUANTEC EASYDATA (2023)

The figure above illustrates that the Western Cape province and national growth tend to move in a similar manner over the period, noting that the Western Cape agricultural industry is about 14,2% of the agricultural output for the aggregate economy in 2021. It is important to note that government support for the agriculture industry has played a crucial role in the growth of the industry through various policies, programs, and incentives to support the industry. The support aims to promote sustainable agriculture, improve rural livelihoods, and enhance food security in the country.

The mining and quarrying industry is also a key sector in terms of its intensity for freight transportation. It is a key sector for the country; however, it plays a relatively minor role for the Western Cape province, noting that the province is not known for significant mining activities compared to other regions in the country. The province mainly focuses on the extraction of construction materials and industrial minerals, also noting the steel mills that process iron ore in the province (The DTI, 2020). The figure below provides the GVA growth for the industry for the country and Western Cape province. Of interest is the inverse relationship between Western Cape and South Africa in the most recent years.

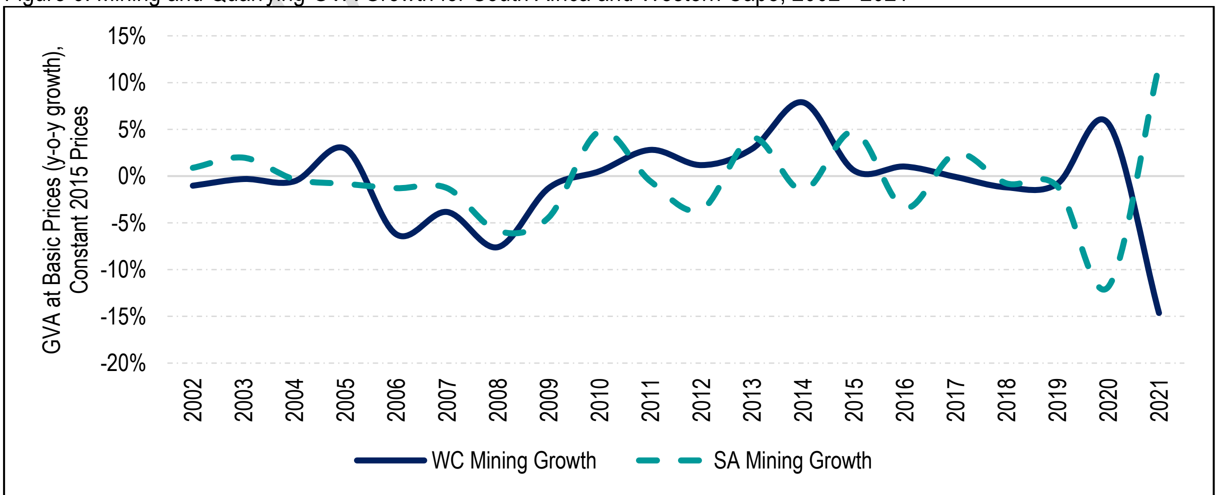
Figure 5: Mining and Quarrying GVA for South Africa and Western Cape, 2001 - 2021



Source: Quantec EasyData (2023)

Figure 5 shows a downward trend in the mining and quarrying industry for the country as well as the Western Cape province. This may be due to several factors, including policy uncertainty, unreliable energy supply as well as challenges regarding "procurement mafias" among other factors (Stoddard, 2021). The following figure illustrates the growth trends for the mining and quarrying industry over the period.

Figure 6: Mining and Quarrying GVA Growth for South Africa and Western Cape, 2002 - 2021

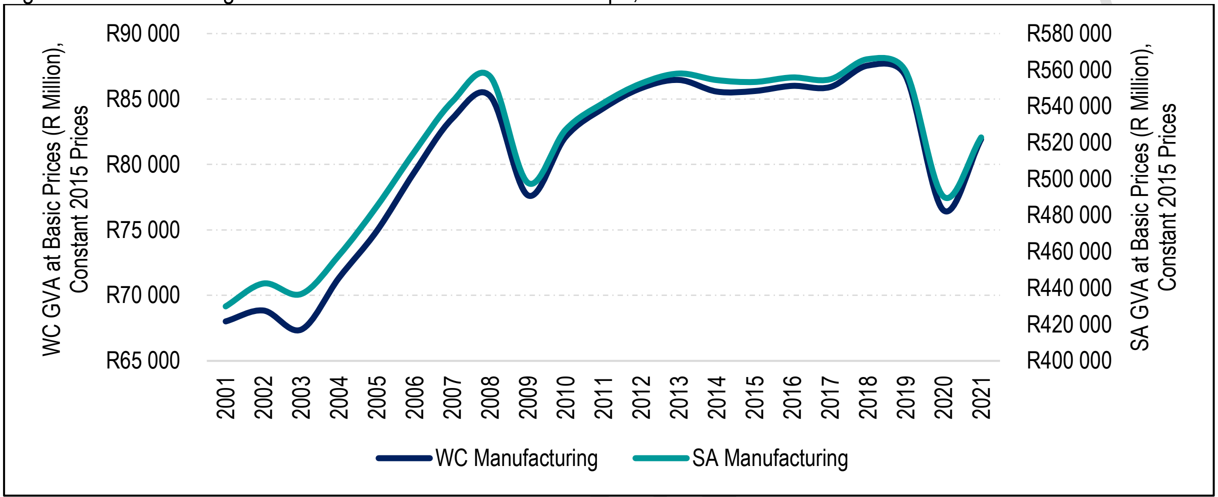


Source: Quantec EasyData (2023)

Figure 6 above shows that the year-on-year growth for the industry slightly fluctuated over the period, with the exception of the 2019 to 2021 period noting external shocks such as the COVID-19 pandemic. The average growth over the period was -0,6% for the Western Cape province and -0,3% for the country in this industry. These findings suggest levels of stagnation in the industry which may be due to factors such as volatility in global commodity prices, rising production costs, infrastructure challenges as well as regulatory uncertainty amongst others (Madubela, 2022).

The manufacturing industry in the country has an important role as it is vital for economic growth, job creation, and industrial development. It also integrates with the primary sector through agro-processing and mineral beneficiation, adding value to the raw inputs into various products. The figure below provides a snapshot of the GVA trends for the industry in the country and in the Western Cape province.

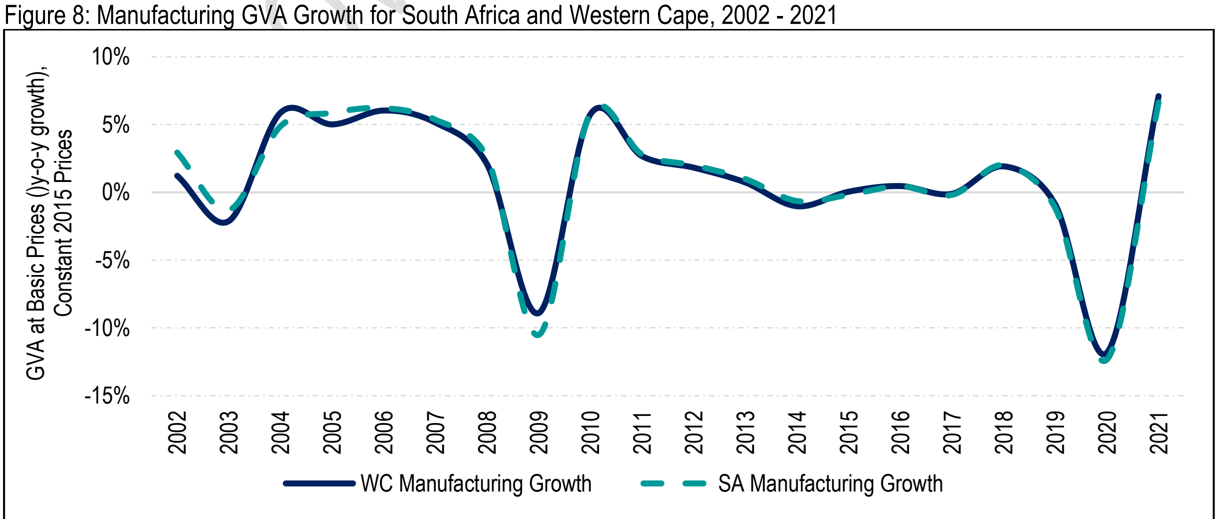
Figure 7: Manufacturing GVA for South Africa and Western Cape, 2001 - 2021



SOURCE: QUANTEC EASYDATA (2023)

Figure 7 shows that the manufacturing industry had an upward trend in terms of the GVA output for the country as well as the Western Cape province. For the province, the industry was the second largest contributor to overall GVA, which accounted for about 14,2% in 2021. The industry in the province participates in a range of manufacturing activities that include food and beverage processing, clothing and textiles, automotive components as well as electrical machinery and apparatus (WC Government, 2021). It is also prudent to note that the province may be an emerging hub for renewable energy equipment manufacturing (Petersen, 2020). The figure below illustrates the growth trends for the industry over the period.

Figure 8: Manufacturing GVA Growth for South Africa and Western Cape, 2002 - 2021



SOURCE: QUANTEC EASYDATA (2023)

The figure above shows that the GVA growth of the manufacturing industry in the Western Cape province closely mirrors that of the country, with an average growth of about 1,0% for the province and 1,1% for the country over the period. Significant declines are also observed within the period, which can be attributed to global economic events such as the 2018/19 financial crisis and COVID-19 lockdown regulations in 2020.

The following section highlights the performance of employment in the Western Cape.

A REGIONAL OVERVIEW OF EMPLOYMENT ACROSS THE FREIGHT-INTENSIVE SECTOR FOR THE WESTERN CAPE

The table below shows the total employment among the economic industries in the Western Cape for 2020 to 2022.

Table 1: Employment by Industry

Industry	2020	2021	2022
Agriculture, forestry and fishing	191 795	173 977 ↓	204 021 ↑
Mining and quarrying	5 423	5 674 ↑	5 994 ↑
Manufacturing	298 891	291 012 ↓	325 321 ↑
Electricity, gas and water	5 581	5 510 ↓	8 921 ↑
Construction	175 372	184 568 ↑	167 410 ↓
Wholesale and retail trade, catering and accommodation	462 275	420 762 ↓	466 978 ↑
Transport and storage	136 876	134 810 ↓	134 778 ↓
Finance, insurance, real estate and business services	409 398	468 912 ↑	471 087 ↑
Community and social services	499 834	449 276 ↓	502 016 ↑
Private households	122 901	128 861 ↑	127 037 ↓

Source: Statistics South Africa (2023)

The total number of jobs for the province was about 2,4 million in 2022 largely in the tertiary sector (about 70,5% of total jobs). The freight-intensive industries contain a relatively large share of workers, which is about 22% of total jobs. This finding shows the significance of the industries as the industries can absorb workers of various skill levels.

Employment in Agriculture

The increases in minimum wages effective March 2021 were a concern and contributed to job creation in the agricultural sector. Challenges such as Covid-19 effects, excessive rains, disease outbreaks in the livestock industry, trade barriers in fruits and wool, and logistical challenges at different ports contributed to a decrease in job creation in 2021. Employment in the agricultural sector had roughly a better performance in 2022, showing that the sector is gaining traction. According to Stats SA (2022), the agricultural sector in the 1st quarter of 2002 increased by 0.8% (q/q) and 3.6% on a (y/y) basis due to the substantial contribution of the horticultural sector.

The section analyses and compares GPI by district in the Western Cape.

AN ANALYSIS AND COMPARISON OF THE GPI BY DISTRICT IN THE WESTERN CAPE

The GPI was calculated using GVA at basic prices in constant 2015 terms for all three sectors. These freight-intensive sectors are experiencing growth in recent years, except for mining and quarrying in 2021, and are expected to continue to grow due to more investment opportunities that are available in the country and the province.

Agriculture, forestry and fishing in the Western Cape province provide a wide range of development opportunities and create jobs. The production of wine, deciduous fruit, citrus, grain, fynbos, vegetables, ostriches, small and large stock, and milk and dairy products varies in the agricultural sector for the province. The table below shows the GPI at district level in the Western Cape for the agriculture, forestry and fishing sector at different time intervals.

The City of Cape Town has had the highest GPI since 2001, but the performance by the sector in the district is slipping. The City of Cape Town and West Coast performance leads from different intervals.

Table 2: Agriculture, Forestry and Fishing Growth Performance Index at Western Cape District Level

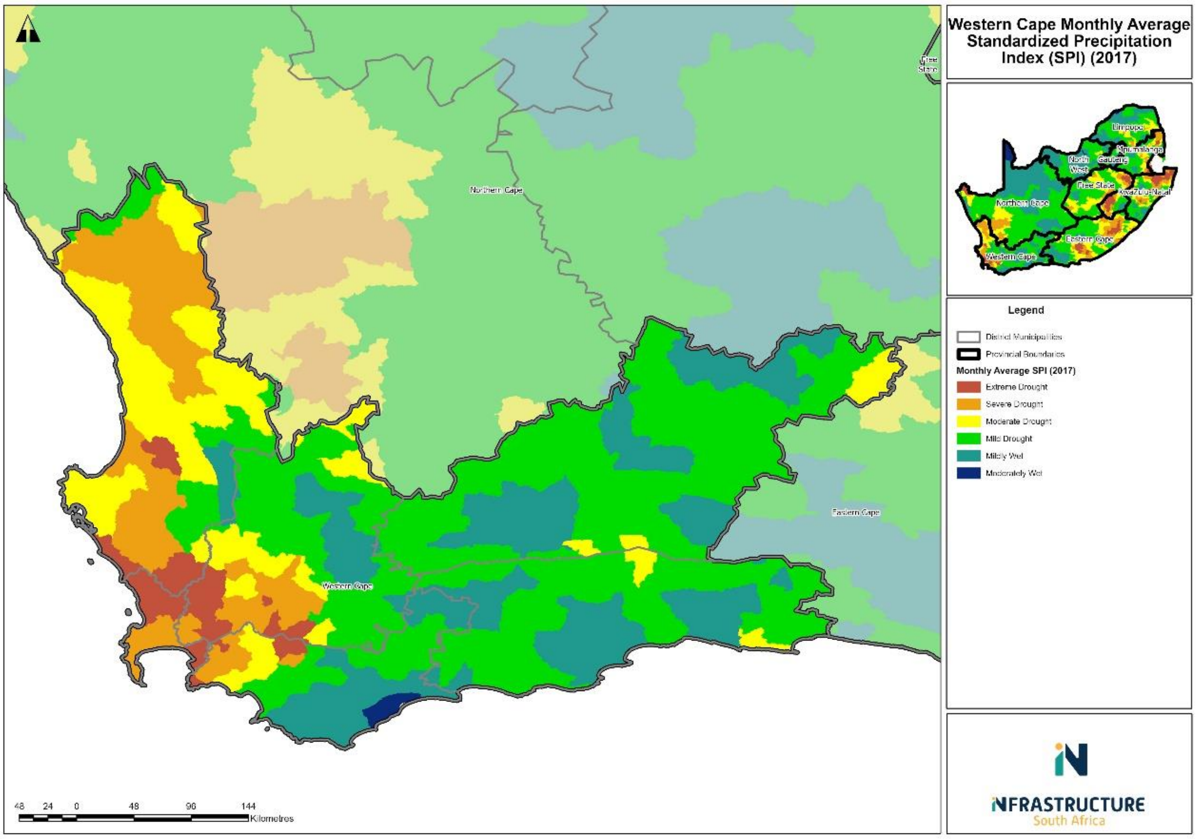
GPI	Agriculture, forestry and fishing						
	20-year	15-year	10-year	5-year	1-year	5-year Rank	Indicator
	2001 - 2021	2006 - 2021	2011 - 2021	2016 - 2021	2020 - 2021	Rank	Leading/Lagging
City of Cape Town	117,3	110,0	108,0	102,9	100,6	1	*Leading*
West Coast	108,4	105,4	104,8	102,5	100,3	2	*Leading*
Cape Winelands	89,0	94,2	94,9	97,7	99,6	4	*Lagging*
Overberg	80,5	85,7	89,5	95,0	99,2	6	*Lagging*
Eden	88,1	88,5	91,4	95,9	99,4	5	*Lagging*
Central Karoo	115,5	119,6	99,2	99,9	99,7	3	*Lagging*

Source: Quantec EasyData (2023) and ISA Calculations

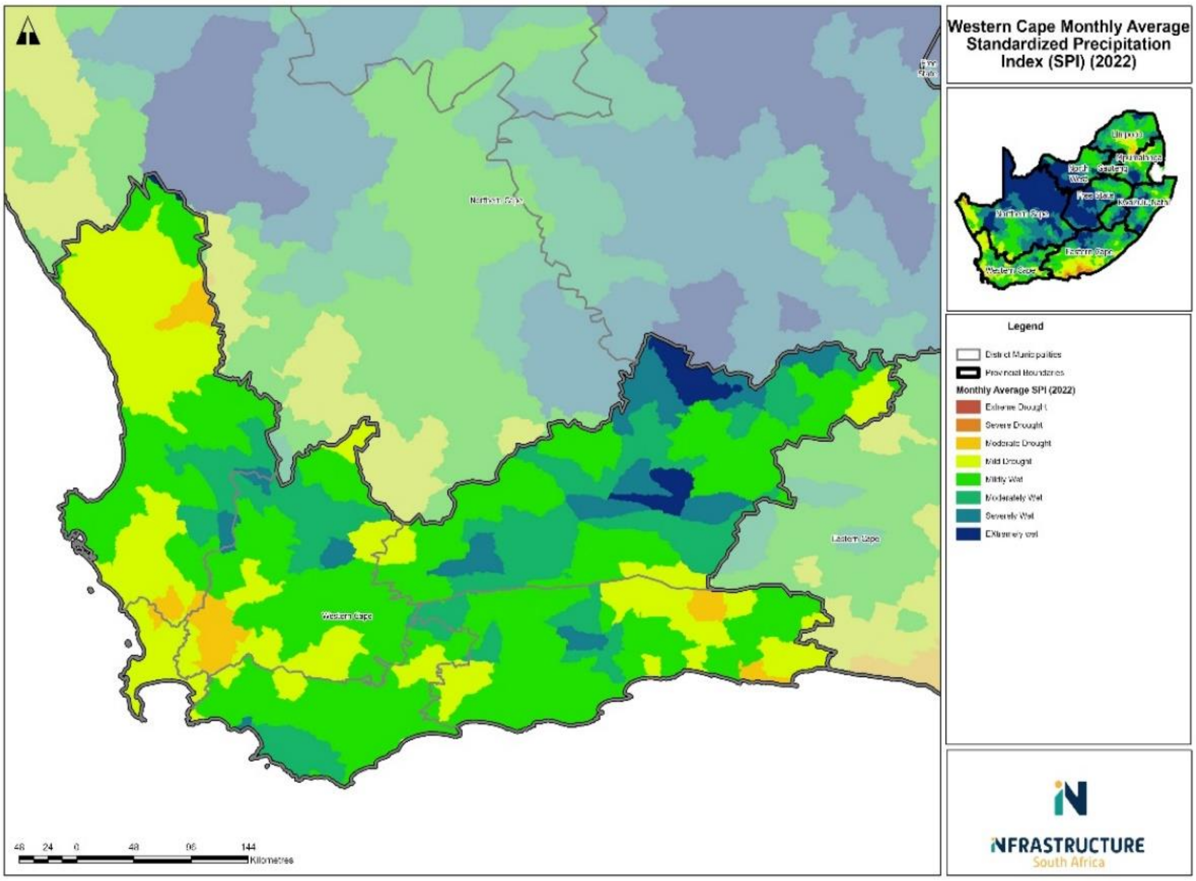
THE ROLE OF THE WESTERN CAPE DROUGHTS IN THE AGRICULTURE SECTOR PERFORMANCE

Weather, besides land, plays a significant role in the agricultural environment. Notably, the Western Cape's climate differs from the rest of South Africa. The dry winter rainy season and extremely hot summer in the previous years contributed to the drought situation in the WC. It is important to note that the Western Cape still has water restrictions for the foreseeable future to ease the pressure on the water supply.

The Standard Precipitation Index (SPI) is a relatively new drought index based only on precipitation. The Standardised Precipitation Index (SPI - McKee et al., 1993) was developed to monitor the occurrence of droughts from rainfall data. The index quantifies precipitation deficits on different time scales and drought severity. It indicates rainfall conditions per quaternary catchment (in this case) based on the historical distribution of rainfall. The maps below show the SPI in the Western Cape.

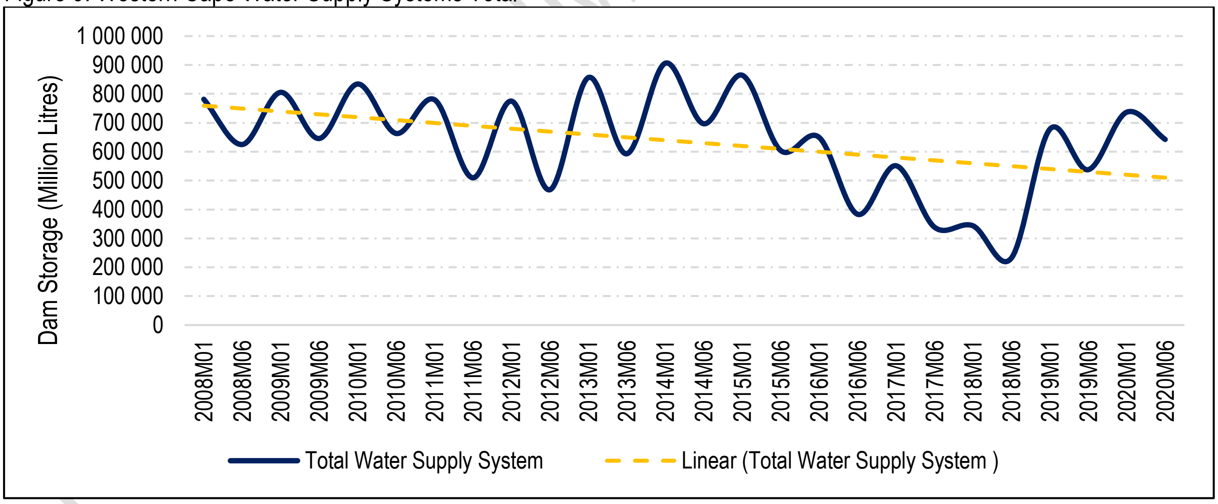


Source: ISA and National Joint Drought Co-ordinating Committee Data is hosted by National Disaster Management Center



Source: ISA and National Joint Drought Co-ordinating Committee Data is hosted by National Disaster Management Centre

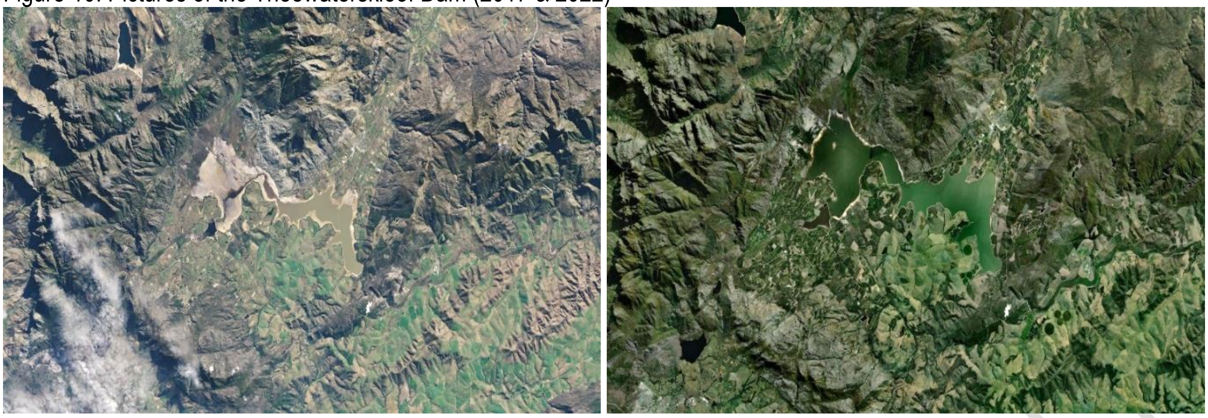
Figure 9: Western Cape Water Supply Systems Total



Source: Climate system analysis group - UCT

The figure above shows the six largest dams in the Western Cape that form part of the province's water supply system. Theewaterskloof Dam, Wemmershoek Dam, Steenbras Lower Dam, Steenbras Upper Dam, Voëlvlei Dam and Berg River Dam. South Africa relies on its rainwater, which is unpredictable and decreasing because of global warming. Water supply levels started dropping in 2015. Cape Town's 'Day Zero' became the focus of the province's water crisis. Dam storage in 2018 was at its lowest shown in the graph above.

Figure 10: Pictures of the Theewaterskloof Dam (2017 & 2022)



The images above show the Theewaterskloof Dam in 2017 and 2022. Theewaterskloof is the biggest dam in the Western Cape. In 2017, the water storage levels were at 28%; in 2022, water storage levels were at 74.2%, showing an increase in water storage. The rainfalls experienced in the Western Cape helped significantly increase dam storage levels.

Manufacturing comprises of different sub-sectors in the province. The sector was adversely affected by the COVID-19 pandemic due to external demand and supply value chains collapsing. The manufacturing sector in the province is one of the strongest economic sectors. The table below shows the GPI at the district level in the Western Cape for the manufacturing sector. Overberg and the West Coast have the highest GPI in the province, despite the fact that growth has been on a decline over the years.

Table 3: Manufacturing Growth Performance Index at Western Cape District Level

GPI	Manufacturing						
	20-year	**15-year**	**10-year**	**5-year**	**1-year**	**5-year Rank**	**Indicator**
	2001 - 2021	**2006 - 2021**	**2011 - 2021**	**2016 - 2021**	**2020 - 2021**	**Rank**	**Leading/Lagging**
City of Cape Town	99,2	99,1	98,9	99,3	100,0	5	*Lagging*
West Coast	137,4	124,4	116,8	109,8	101,5	2	*Leading*
Cape Winelands	74,3	80,6	89,6	95,0	98,6	6	*Lagging*
Overberg	162,7	143,3	124,3	110,0	101,7	1	*Leading*
Eden	126,1	117,9	108,3	103,0	100,2	4	*Leading*
Central Karoo	103,6	104,6	106,6	105,6	100,6	3	*Leading*

Source: Quantec EasyData (2023) and ISA Calculations

Mining and mineral beneficiation plays a pivotal part in South Africa's economy; the country is commodity rich, and the sector plays a crucial role in providing job opportunities to a significant amount of unskilled to semi-skilled labour. The table below shows the GPI at the district level in the Western Cape for the mining and quarrying sector. All the municipalities except the West Coast have great potential in the mining and quarrying sector. The mining and quarrying sector in Central Karoo has the highest 20-year and 1-year GPI, indicating overperformance/leading indicators.

Table 4: Mining and Quarrying Growth Performance Index at Western Cape District Level

GPI	Mining and quarrying						
	20-year	**15-year**	**10-year**	**5-year**	**1-year**	**5-year Rank**	**Indicator**
	2001 - 2021	**2006 - 2021**	**2011 - 2021**	**2016 - 2021**	**2020 - 2021**	**Rank**	**Leading/Lagging**
City of Cape Town	104,8	103,2	103,2	102,0	100,3	4	*Leading*
West Coast	85,4	88,8	89,4	91,7	98,4	6	*Lagging*
Cape Winelands	108,4	104,6	102,0	101,9	100,6	5	*Leading*
Overberg	111,0	109,1	107,9	108,6	100,4	1	*Leading*

Eden	98,7	101,7	102,4	103,5	100,7	3	*Leading*
Central Karoo	126,2	116,5	108,5	105,8	100,8	2	*Leading*

SOURCE: QUANTEC EASYDATA (2023) AND ISA CALCULATIONS

The next section provides an analysis of GPI by the freight-intensive sectors in the province.

AN ANALYSIS OF THE GPI BY FREIGHT-INTENSIVE SECTORS IN THE WESTERN CAPE

This section provides an analysis of the GPI in the Western Cape by the main economic sectors. An analysis is provided for an incremental interval period starting 2001 to 2021. The agriculture, forestry and fishing sector, for the 20-year, 15-year, 10-year and 5-year intervals, is a lagging indicator as the GPI value falls below 100. If the GPI is calculated between 2021 and 2020, then the sector is performing in line with the national agriculture, forestry and fishing. The GPIs are ranked based on the 5-year GPI. If this is considered, the Western Cape's agriculture, forestry and fishing sector is the worst performer as the GPI ranks last (10th). The mining and quarrying sector, which is also highly freight intensive, is a lagging indicator for all calculated intervals except for the 10-year interval. Based on the 5-year calculation, the sector ranks 9th (second lowest). The manufacturing sector is a leading indicator as per GPI calculations for all intervals except for the 20-year interval. This sector's GPI ranks the second highest amongst all ten sectors in the Western Cape.

Table 5: Western Cape GPI by Main Economic Sector, Incremental-year Interval Comparison

GPI	20-year	15-year	10-year	5-year	1-year	5-year Rank	5-year indicator
	2001 - 2021	2006 - 2021	2011 - 2021	2016 - 2021	2020 - 2021	Rank	Leading/Lagging
Agriculture, forestry and fishing	96,4	92,6	93,8	85,3	100,0	10	*Lagging*
Mining and quarrying	94,1	99,7	101,8	89,1	76,3	9	*Lagging*
Manufacturing	99,1	101,6	100,7	101,3	100,4	2	*Leading*
Electricity, gas and water	100,8	93,0	99,0	99,0	100,8	7	Lagging
Construction	119,8	95,6	100,3	98,6	99,9	8	Lagging
Wholesale and retail trade, catering and accommodation	101,5	100,2	101,5	99,7	101,0	4	Lagging
Transport, storage and communication	99,4	98,1	98,4	99,4	100,1	5	Lagging
Finance, insurance, real estate and business services	102,3	102,2	101,8	100,5	99,9	3	Leading
General government	98,6	99,1	99,7	99,3	99,2	6	Lagging
Community, social and personal services	105,2	105,3	103,5	101,9	102,0	1	Leading

SOURCE: QUANTEC EASYDATA (2023) AND ISA CALCULATIONS

The next section analyses the EPI of the three freight-intensive sectors in the Western Cape.

AN ANALYSIS OF THE EPI BY FREIGHT-INTENSIVE IN THE WESTERN CAPE

The table below provides the EPI by the ten main economic sectors in the Western Cape with a specific focus on the three freight-intensive sectors. The agriculture, forestry and fishing sector has transitioned into a lagging indicator when looking at the 5- and 1-year EPI. Based on the 5-year EPI, the sector ranks 8th. The mining and quarrying sector's EPI is a leading indicator and ranks 1st. The manufacturing sector's EPI also proves to be a leading indicator and 3rd.

Table 6: Western Cape EPI by Main Economic Sector, Incremental-year Interval Comparison

EPI	10-year	5-year	1-year	5-year Rank	5-year indicator
	2011 - 2021	2016 - 2021	2020 - 2021	Rank	Indicator
Agriculture, forestry and fishing	111,7	84,3	88,8	8	*Lagging*
Mining and quarrying	115,3	242,7	111,8	1	*Leading*
Manufacturing	116,9	114,3	105,7	3	*Leading*
Electricity, gas and water	46,2	75,7	100,6	9	Lagging
Construction	122,4	103,0	106,7	6	Leading
Wholesale and retail trade, catering and accommodation	100,9	103,2	95,7	5	Leading

EPI	10-year 2011 - 2021	5-year 2016 - 2021	1-year 2020 - 2021	5-year Rank Rank	5-year indicator Indicator
Transport, storage and communication	94,5	103,8	96,3	4	Leading
Finance, insurance, real estate and business services	112,6	115,0	113,7	2	Leading
Community, social and personal services	96,0	99,9	95,1	7	Lagging

Source: Statistics South Africa (2023) and ISA Calculations

The next section focuses on comparing the EPI and GPI from the three freight-intensive sectors in the Western Cape.

GPI AND EPI RANK AND INDICATOR COMPARISON

Agriculture, forestry, and fishing

This sector proves to be a lagging indicator based on both EPI and GPI. In terms of ranking, the sector performs poorly as compared to the remaining economic sectors in the province.

Mining and quarrying

The mining and quarrying sector is a leading indicator and ranks very high in terms of the calculated EPI. However, the GPI shows that the sector is a lagging indicator and ranks almost last.

Manufacturing

In terms of GPI and EPI, the manufacturing sector is a leading indicator and also ranks high amongst the other sectors in the Western Cape.

Table 7: Western Cape EPI and GPI, Rank and Indicator Comparison

Sector	EPI		GPI	
	5-year Rank	5-year indicator	5-year Rank	5-year indicator
	Rank	Indicator	Rank	Leading/Lagging
Agriculture, forestry and fishing	8	*Lagging*	10	*Lagging*
Mining and quarrying	1	*Leading*	9	*Lagging*
Manufacturing	3	*Leading*	2	*Leading*
Electricity, gas and water	9	Lagging	7	Lagging
Construction	6	Leading	8	Lagging
Wholesale and retail trade, catering and accommodation	5	Leading	4	Lagging
Transport, storage and communication	4	Leading	5	Lagging
Finance, insurance, real estate and business services	2	Leading	3	Leading
Community, social and personal services	7	Lagging	1	Leading

Source: ISA Calculations

The next section will draw conclusions based on the analysis provided in this technical note.

CONCLUSIONS

The purpose of this technical note was to provide an analysis of various economic indicators of the freight-intensive sectors in the Western Cape. The sectors are agriculture, forestry and fishing, mining and quarrying and manufacturing. The economic indicators analysed are GVA, employment, GPI and EPI. The GPI was determined for the main economic sectors in the province as a total. In addition, this technical note drilled down per district to establish the GPI for the three freight-intensive sectors. Indices intervals of one, five, ten and 20 years were analysed.

The freight-intensive industries play a key role as they contribute significantly to regional GVA and employment thereof. The agriculture and manufacturing industries showed overall growth over the two decades and were labour-absorbing industries overall. Although the mining and quarrying industry plays a relatively minor role in the Western Cape province, it is required for the extraction of construction material as well as industrial inputs. The industries may have potential export opportunities, requiring infrastructure support to support sustained growth and unlock any latent economic potential.

The dry winter rainy season and extremely hot summer in the previous years contributed to the drought in the WC. The province's measures in encouraging residents to keep collective water usage is a way to mitigate the effects of the risk of another below-average winter rainfall, reducing dam levels, and assisting the reliability of the water supply affected by ongoing load shedding. The Theewaterskloof Dam, the largest dam in the province, accounted for a significant water supply and was at a 73% dam level in 2022. Agriculture was affected by the drought but gradually improved in the province. Water conservation is important in the WC to not affect businesses and other water users.

The freight-intensive sectors' GPI for the Western Cape districts were calculated using GVA at basic prices in constant 2015 terms. The GPI at the district level in the agriculture, forestry and fishing sector shows that the City of Cape Town has the highest GPI and is, therefore, a leading indicator. Overberg and West Coast have the highest GPI in the manufacturing sector in the province. In the mining and quarrying sector, all the municipalities except the West Coast have great potential in the sector. Central Karoo has the highest GPI. Manufacturing and mining, and quarrying are determined to be leading indicators, indicating the high potential for these sectors in the province to grow year on year.

Based on the EPI (84,3; rank 8) and GPI (85,3; rank 10), the agriculture, forestry and fishing sector is a lagging indicator and almost ranks the lowest compared to the remaining sectors in the Western Cape economy. The sector lagging typically indicates that it is less volatile to external shocks and relative resilience. The low GPI indicates slower growth relative to the country, which is supported by fluctuating growth in the sector since 2002 illustrated by Figure 4. The sector remains a key industry in the Western Cape economy, contributing almost one fifth of South Africa's national agricultural output.

The mining and quarrying sector results in the province are mixed based on these two indicators. The EPI (242,7; Rank 1) indicates the sector as leading and ranks quite high, while the GPI (89,1; Rank 9) shows the sector as lagging and ranks very low. The EPI in this specific sector overperforms given the ability of the sector to employ a large number of unskilled to low-skilled workers, which a great part of the South African labour force and the population consists of. At the same time, the mining sector uses sub-contractors and labour brokers, which during the period between 2015 and 2019 specifically, increased significantly. The low GPI in this sector indicates the transition from primary and secondary sector dominance to tertiary-driven economic growth.

On the other hand, the manufacturing sector ranks very high and is shown to be leading based on both EPI (114,3; rank 3) and GPI (101,3; rank 2). The EPI above 100 shows the labour-absorbing ability of the sector that highlights an overall positive trend in job creation within the sector, noting that the sector employs across all skill levels. The trend is also partly due to the recognition of the province for appropriate interventions to enhance job creation and improve the labour market performance in the province. The GPI for the sector indicates steady increases in production, which may be linked to the adaption of automation of certain processes and the use of newer technologies to enhance the output generated.

Overall, the three sectors analysed in this technical note highly rely on freight infrastructure. Road freight has significantly increased over the years while that of rail has declined. The result is that additional pressure is put on road infrastructure, especially given the lack of maintenance in rail infrastructure.

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