SPATIAL DEVELOPMENT FRAMEWORK 2021-2026

CAPE WINELANDS DISTRICT
MUNICIPALITY • MUNISIPALITEIT • UMASIPALA

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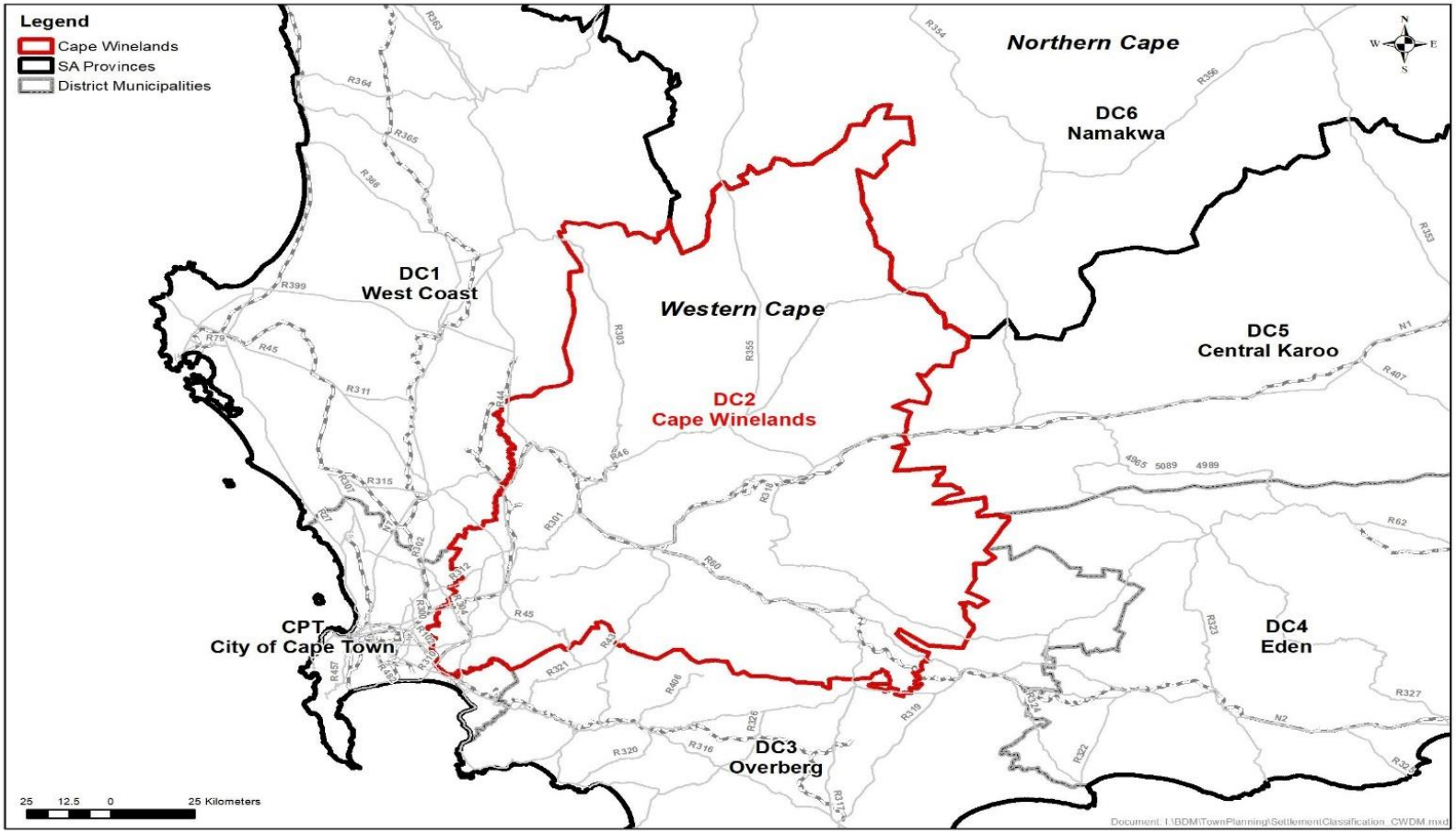
3: Cape Winelands District Municipal Climate Change Adaptation Strategy

4. Cape Winelands District Municipal Invasive Alien Plant Clearing Coordination Framework

1. INTRODUCTION

1.1 STUDY AREA

The Cape Winelands district is situated next to the Cape Metropolitan area and encloses 22 309.47km². It is a landlocked area between two coastal regions, the West Coast and Overberg districts and inland regions, Namakwa (Northern Cape Province) and Central Karoo districts.



1.2 STRATEGIC CONTEXT

The Cape Winelands Spatial Development Framework identifies eighteen (18) key focus areas for intervention that are spread across four chapters (refer to table 1 below).

CHAPTERS:	KEY FOCUS AREAS
A. DEMOGRAPHICS AND BUILT ENVIRONMENT:	1. Population growth & migration 2. Hierarchy of towns 3. Growth potential of towns 4. Municipal services financial model 5. Integrated district public transport network 6. Cultural landscapes: Sense of place 7. Water infrastructure 8. Solid waste disposal 9. Disaster management
B. DISRTICT SPACE ECONOMY:	10. Economic growth sectors 11. Municipal space economy 12. Agri parks District Level Implementation: Space Economy Linkages 13. Urban and rural growth management priorities
C. BIODIVERSITY & ECOSYSTEM SERVICES	14. Biodiversity 15. Ecosystem services 16. Invasive alien species 17. Cape Winelands Biosphere Reserve
D. CLIMATE CHANGE:	18. Rain and temperature
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ANNEXURE 1	Municipal Financial Impact Analysis
ANNEXURE 2	Cape Winelands District Capital Investment Framework
ANNEXURE 3	Cape Winelands District Municipal Climate Change Adaptation Strategy
ANNEXURE 4	Cape Winelands District Municipal Invasive Alien Plant Clearing Coordination Framework

The key focus areas were chose based on the functions of the Cape Winelands District Municipality in terms of Section 84 (1) of the Municipal Structures Act (117 of 1998), assigned functions i.e., Disaster Management and relevant issues and concerns that have an impact on the Cape Winelands District and broader Cape Metropolitan Functional Region landscape.

Cognisance is also given to the structural deficiencies that was highlighted by the Greater Cape Metro Regional Spatial Implementation Framework (GCM RSIF) which are:

- Pervasiveness of socio-spatial segregation,
- Sprawling and low-density multi-nodal network of settlements,
- Mismatches between where people live and work,
- Isolated concentrations of poverty severed from economic opportunities, and
- Underinvestment in public transport and freight infrastructure, making the region inaccessible to most residents and inefficient for business to operate in.

These challenges must be addressed, although site specific and at a lower scale than the CWDM SDF's strategic focus, strategies will none the less be proposed to deal with these structural deficiencies that are evident throughout the CWDM.

Strategically, in the context of **human settlements**, the emphasis is on considering the functionality of settlements, their economic growth potential, migration and urbanisation challenges (bulk services, transport modes, solid waste disposal etc.) and the creation of a framework in which rational decisions can be made in terms of capital investment and social support programs.

The **district space economy** chapter highlights the strength of economic growth sectors that are located within the urban space economy, it also acknowledges the importance of the primary sector (agriculture). The industries that perform strongly in the urban space economy has backward linkages to agriculture. Strategically, this chapter emphasise the importance of integrated planning and the coordination of public sector investment within the urban space economy. The agri parks programme from the National Department of Rural Development and Land Reform will be implemented in each district municipality. In the case of the CWDM, the agri hub will be located in Ceres (Witzenberg Municipality). Various other towns were selected as farmer productions support unit points. The farmer production support unit points are aligned to poverty pockets. According to the Draft Rural Development Plan

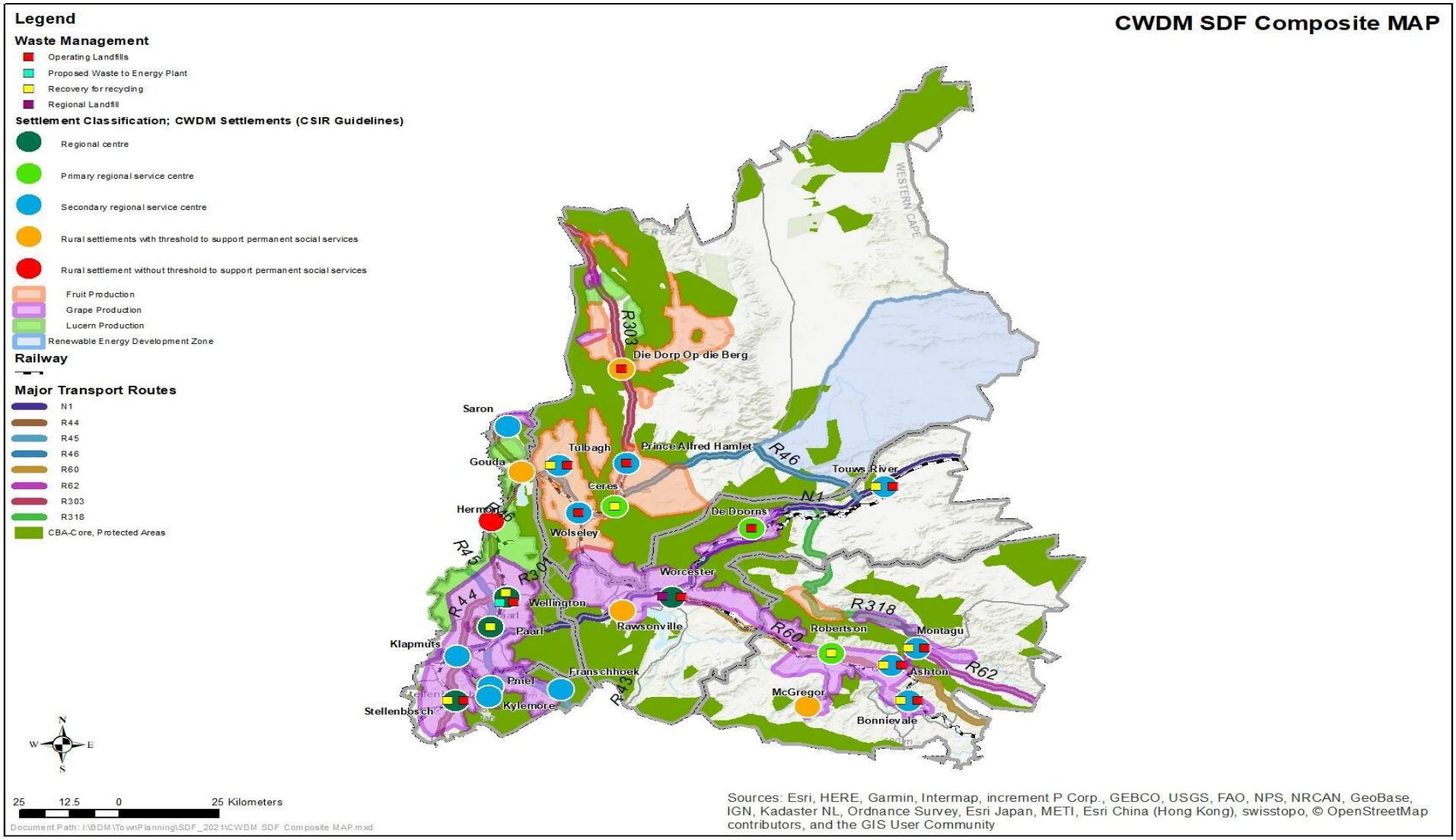
(19/12/2016) various projects were proposed for the farmer production support unit points. The CWDM SDF supports the proposed investment into the farmer production support unit points and agri hub (Ceres, Witzenberg Municipality) from a strategic perspective.

Biodiversity conservation remains a challenge in the CWDM area. Rapid urbanisation, agricultural expansion and the impact of climate change poses a major threat to the Cape Floristic Region as well as ecosystem sources (water, air, biodiversity and soil). The CWDM area consist of Fynbos, Succulent Karoo, Albany Thicket an Afro-temperate Forest biomes. The CWDM SDF spatially reflects the important areas for protection and refers users to the Western Cape Biodiversity Spatial Plan and its accompanying handbook.

The impact of **climate change** has already been felt with the recent and potential ongoing drought as well as rain surges that causes flooding. From a land use planning perspective various site-specific measures needs to be put in place as well as disaster risk related systems that relates more to adaptation to anticipated and unanticipated occurrences. Strategically, adaptation and mitigation measures are prioritised.

In conclusion, the purpose of the Cape Winelands Spatial Development Framework is to lay down a 'set of guidelines' to:

- Interpret and apply higher-order spatial policy within the Cape Winelands district.
- Guide regional and local policy interventions.
- Act as a strategic forward-planning tool to guide planning and decisions on land use and land development.
- Develop a spatial logic that guides public and private-sector investment.
- Ensure the social, economic, built and environmental sustainability of the area, and
- Formulate proposals to redress the spatial legacy of apartheid.



Map 1: CWDM Composite Map

1.3 PRINCIPLES OF THE CWDM SDF

The CWD SDF adopts the principles of the Spatial and Land Use Planning Act (16 of 2013, which are: **Spatial Justice**: A socially just society is one that embraces the qualities of equity, solidarity and inclusion. Whilst equal opportunity targets everyone in the community, social justice targets marginalised and disadvantaged groups. Inclusionary settlements focus on the public realm rather than on private enclaves; support civic interaction and equitable access throughout the public environment; and make urban opportunities accessible to all, especially the poor. Inclusionary economies have low barriers to entry, do not discriminate between the formal and informal sectors, and take active measures to empower those previously restricted in their access to the means of production. Past spatial imbalances are redressed by improving access to, and use of, land. **Spatial Sustainability**: Land development should be spatially compact, resource- frugal, compatible with cultural land scenic landscapes, avoid alienating productive landscapes, and not compromise the functionality of ecosystems. **Spatial Resilience**: Resilience is about the capacity of regions to withstand shocks and disturbances such as climate change or economic crises, and to use such events to catalyse renewal, novelty and innovation. The focus is on creating complex, diverse and resilient spatial systems that are sustainable in all contexts. **Spatial Efficiency**: Efficiency relates to the form of regional settlements and use of resources compaction as opposed to sprawl; mixed- use as opposed to mono-functional land uses; residential areas close to work opportunities as opposed to dormitory settlement; and prioritisation of public transport over private car use. When a settlement is compact higher densities provide thresholds to support viable public transport, reduce overall energy use, and lower user costs as travel distances are shorter and cheaper. Spatially efficient economies are more productive as they minimize business transaction costs and maximise outputs. Spatially compact city-regions provide for the fluid exchange of ideas, goods and services, which establishes an enabling environment for businesses and households to operate in. **Spatial Governance**: Effective governance of city-regions is based on collaboration and coordination, integration and alignment, and transparency. Planning is evidenced based, informs the budgeting process, and spatial targets are incorporated into public investment programmes.

1.4 VISION, MISSION AND OBJECTIVES

The Cape Winelands District Spatial Development Framework as a sector plan of the Cape Winelands District Integrated Development Plan (CWD IDP) adopts the CWD IDP's vision which is "A unified Cape Winelands of Excellence for sustainable development", mission, "All structures of the Cape Winelands co-operate together towards effective, efficient and economically sustainable development".

The objectives of the CWD SDF are:

- To improve the quality of life for the people of the region by ensuring principle led responses
- To plan in advance by considering future population growth, economic and climatic changes
- To manage the impact and exposure of external and internal threats to growth and development
- To restructure urban settlements through compaction and densification
- To promote sustainable resource use and responsible rural development
- To improve and conserve the district's natural environment

The alignment between the CWDM SDF, Integrated Development Plan (IDP) and Service Delivery Business Implementation Plan (SDBIP) is through a coordinated implementation plan based on the following strategic objectives (SO) and implementation budgets linked to strategic objectives:

- Strategic Objective 1; Creating and environment and forging partnerships that ensure social and economic development of all communities, including the empowerment of the poor in the Cape Winelands District.
- Strategic Objective 2; Promoting sustainable infrastructure services and a transport system which fosters social and economic opportunities.
- Strategic Objective 3; Providing effective and efficient financial and strategic support.

1.5 LEGISLATIVE REQUIREMENT FOR THE FRAMEWORK

The Cape Winelands District Municipality compiled a Spatial Development Framework for its area of jurisdiction in terms of Section 26 of the Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000). The CWDM is mandated to do a Spatial Development Framework as a sector plan of the CWDM Integrated Development Plan in terms of the Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000).

As per the Spatial and Land Use Planning Act, 2013 (Act No. 16 of 2013) local government must compile a municipal spatial development framework in terms of Chapter 4, Section 12 (1) of the mentioned Act.

2. DEMOGRAPHICS AND BUILT ENVIRONMENT

2.1 POPULATION GROWTH AND MIGRATION

According to the South African Institute for Race Relations, the Western Cape has shown significant growth in its population. This increase is due to internal migration as people seek job opportunities, facilities, and housing. The PSDF (2014) states that the Western Cape's population is growing faster than national averages, largely on account of in-migration (i.e., Stats SA estimate that the province received a net gain of 225 657 people between 2006 and 2011, 35% of whom were from outside the country, 31% from the Eastern Cape, and some 14% from Gauteng). The fertility rate in the Western Cape has declined considerably over the years and is lower than the rest of the country. Of significance is that in-migration accounts for approximately one-third of the population growth rate, which places additional burdens on government's service delivery efforts particularly in the main economic centres. In the Cape Winelands district, the current growth statistics are as follow.

Table 2: Municipal Annual Growth rates between Census 2001 and Census 2011(Source: Stats SA).

Municipality	Total Population in 2001	Total population in 2011	Annual Growth rate between 2001 and 2011
Witzenberg	83 567	115 946	3.27%
Drakenstein	194 417	251 626	2.6%
Stellenbosch	118 709	155 733	2.71%
Breede Valley	146 028	166 825	1.33%
Langeberg	81 271	97 724	1.84%

Table 3: Municipal Annual growth rate between Census 2011 and 2020 Mid-Year Population Estimates, Stats SA (MYPE2020)

Municipality	Total Population in 2011	Total population in 2020	Annual Growth rate between 2011 and 2020
Witzenberg	115 946	147 620	3%
Drakenstein	251 626	290 378	1.7%
Stellenbosch	155 733	192 493	2.7%
Breede Valley	166 825	192 652	1.7%
Langeberg	97 724	118 119	2.3%

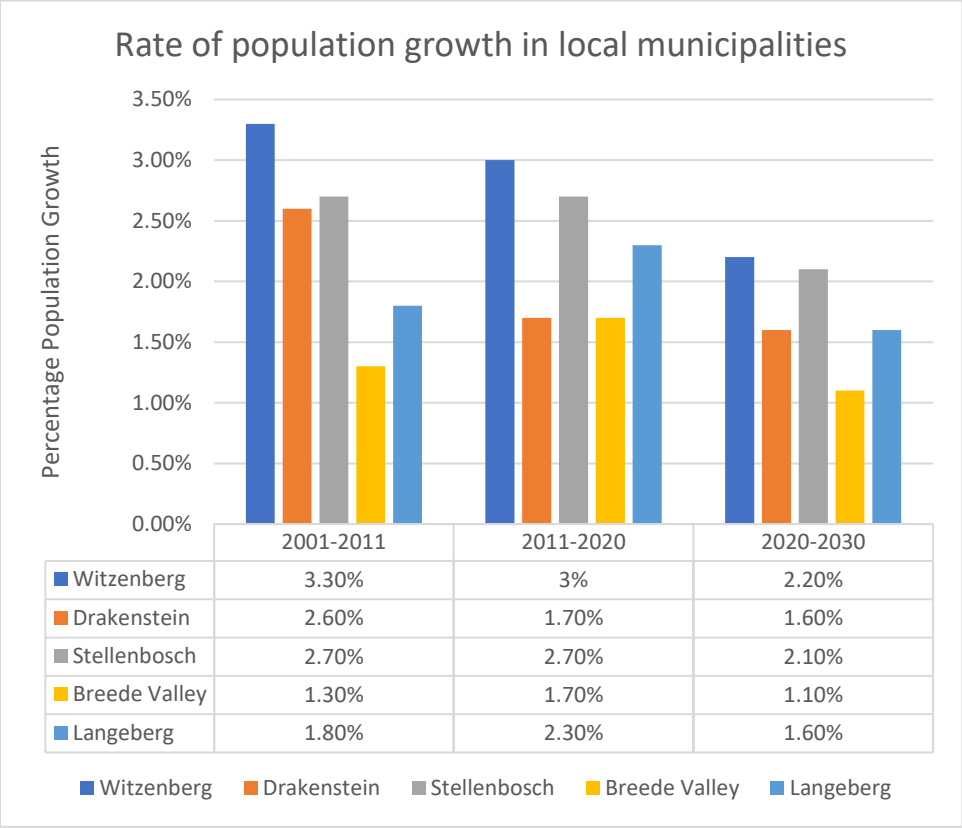
Table 4: Comparing annual population growth rates between two-time frames, namely 2001 – 2011 and 2011 - 2020 to check if the growth rates have increased, declined or remained similar.

Municipality	Annual Growth rate between 2001 and 2011	Annual Growth rate between 2011 and 2020	Increase (↑) Or Decline (↓) in annual population growth rates comparing two time frames
Witzenberg	3.3%	3%	↓
Drakenstein	2.6%	1.7%	↓
Stellenbosch	2.7%	2.7%	→
Breede Valley	1.3%	1.7%	↑
Langeberg	1.8%	2.3%	↑

Table 5: Population growth projections between 2020 and 2030 according to MYPE2020 projections

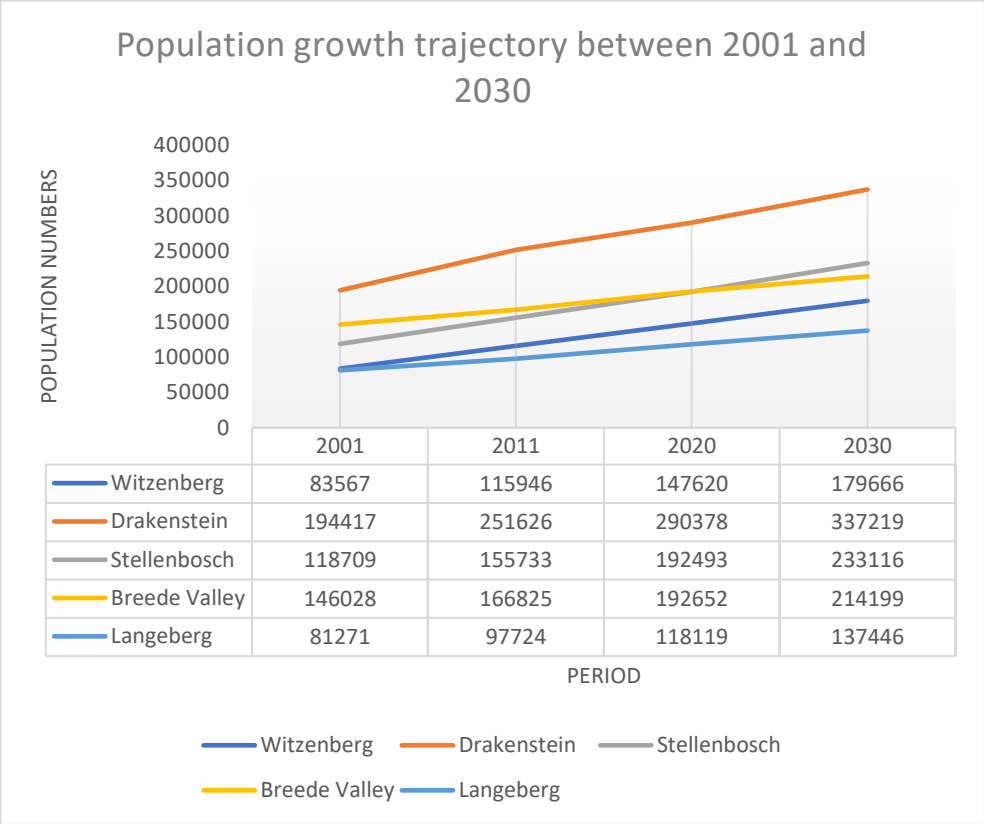
Municipality	Total population in 2020	Total population in 2030	Annual Growth rate between 2020 and 2030
Witzenberg	147 620	179 666	2.2%
Drakenstein	290 378	337 219	1.6%
Stellenbosch	192 493	233 116	2.1%
Breede Valley	192 652	214 199	1.1%
Langeberg	118 119	137 446	1.6%

Graph 1: Population growth between 2001 and 2030 measured in %.



	2001-2011	2011-2020	2020-2030
Witzenberg	3.30%	3%	2.20%
Drakenstein	2.60%	1.70%	1.60%
Stellenbosch	2.70%	2.70%	2.10%
Breede Valley	1.30%	1.70%	1.10%
Langeberg	1.80%	2.30%	1.60%

Graph 2: Population growth trajectory between 2001 and 2030.



	2001	2011	2020	2030
Witzenberg	83567	115946	147620	179666
Drakenstein	194417	251626	290378	337219
Stellenbosch	118709	155733	192493	233116
Breede Valley	146028	166825	192652	214199
Langeberg	81271	97724	118119	137446

Graph 1 indicates an overall decline in population growth rate per municipality. Witzenberg, the fourth smallest municipality in terms of population figures have the highest population growth rate. Witzenberg Municipality contributes the highest percentage in terms of the CWDM GDP primary sector that comprise of agriculture and mining. The labour-intensive nature of the agricultural sector could explain the high population growth rate experienced by Witzenberg municipality. Stellenbosch and Drakenstein Municipalities falls within the functional region of the metro economy, it is expected that the population growth rate of these municipalities will always be high. From Graph 2 above it is anticipated that the total population of Stellenbosch Municipality will overtake that of Breede Valley Municipality within the next 5years. Witzenberg, Stellenbosch and Drakenstein Municipalities shares a similar growth trajectory. Langeberg

Municipality contributed the second largest percentage to the Cape Winelands GDP in terms of the primary sector, agriculture and mining (MERO, 2017). This would probably explain the higher percentage increase in population between 2011-2020 (refer to Graph 1).

The CWDM area experience the following forms of migration:

Gravity flow migration: people settle permanently in their new urban settlement/region. This trend occurs throughout the urban settlements/regions in the CWDM. The urban settlements/regions with the strongest economies/economic sectors that are labour intensive attracts the most migrants i.e., Stellenbosch, Paarl-Wellington, Ceres/Koue Bokkeveld, Worcester/De Doorns, Robertson and Montagu region.

Circulatory migration: this type of migration is specifically linked to outsourced labour used by commercial farmers in the Witzenberg and Langeberg municipal areas. A percentage of outsourced labour return to their place of origin.

Intra urban migration: this is a new trend, this happens as a consequence of poor households splitting up, creating smaller and more households which contribute to residential instability (Todes et al. 2010:345). Todes et al. (2010:344) argue that the splitting of households caused by unmarried persons and youth migration which is a recent dynamic, have a greater impact on spreading poverty and the expansion of cities/towns than rural to urban migration. This contributes towards a growing proportion of the lateral spread of urban areas. This is more common in larger urban settlements i.e., regional centres, Stellenbosch, Paarl-Wellington and to a certain extent Worcester.

2.1.1 Movement of people: Applying the Differential Urbanisation Model to the CWDM

Differential urbanisation can be defined as "*a framework to explain the position and evolution of urban areas in an area by means of main migration patterns*".

Through practical application, the differential urbanization (DU) model explains how groups of small towns, medium-sized cities and large metropolitan areas go through successive periods of fast and slow growth in a continuum of development that spans the evolution of urban systems in developed and developing countries (Geyer, 2001).

Differential Urbanisation consist of three concepts or 'patterns' of movement of people:

a) ***Urbanisation:*** The increase in the urban population of an area due to the following components of urban population growth: (a) urban natural increase (b) urban net migration, and (c) the reclassification of parts of the rural population into the category 'urban' (Statistics South Africa, 2006).
b) ***Polarisation reversal:*** The turning point in the spatial pattern of growth and development in an area when continuing concentration ceases and urban deconcentration commences.
c) ***Counter urbanisation****:* The process where people move from urban areas to surrounding rural areas, it is inversely related to urbanization.

2.1.1.1 Results for the Cape Winelands District

The "Differential Urbanisation within the Western Cape between 1996 and 2016" study applied the Differential Urbanisation model to the Cape Winelands District municipal area.

The model was tested for three urban categories:

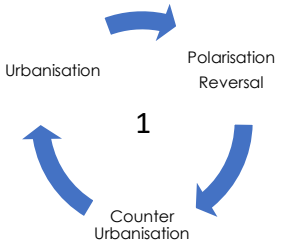
a) ***Primary*****:** Cape Town City Region in Stellenbosch
b) ***Intermediate*****:** Paarl/Wellington, Wolseley, Ceres, Worcester, Franschhoek, Robertson, Montagu
c) ***Small:*** Saron, Tulbagh, Op-die-Berg, Touws River, De Doorns, McGregor, Bonnievale, Ashton

The analysis suggests the following:

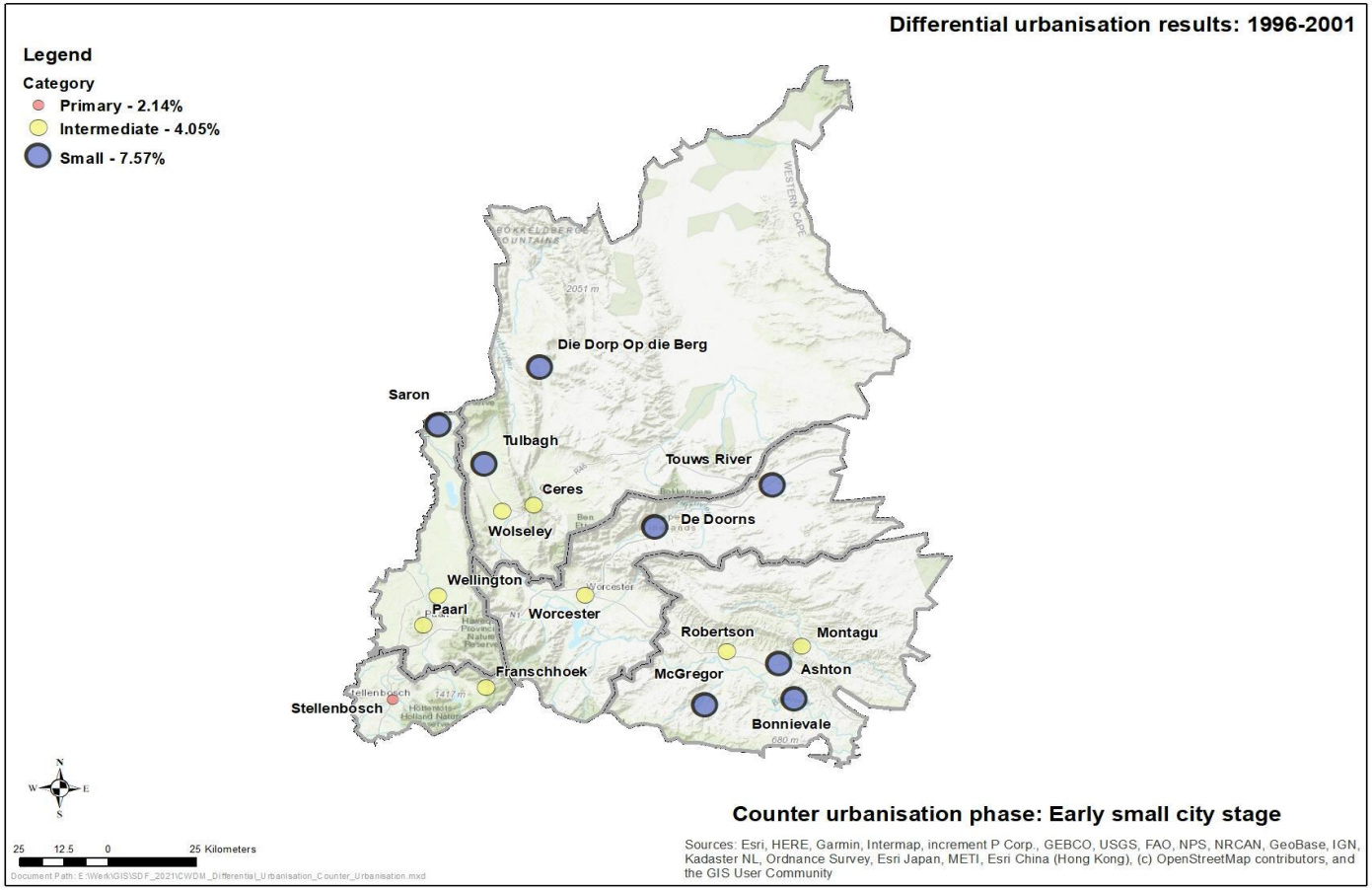
Table 6: Key findings Differential Urbanisation Modelling

Cape Winelands DM Stages of differential urbanization for 1996 - 2016			
City category and DU model classification	**1996-2001**	**2001-2011**	**2011-2016**
Change rate (% for period)			
Primary	2.14%	2.40%	2.31%
Intermediate	4.05%	2.24%	2.48%
Small	7.57%	1.08%	2.40%

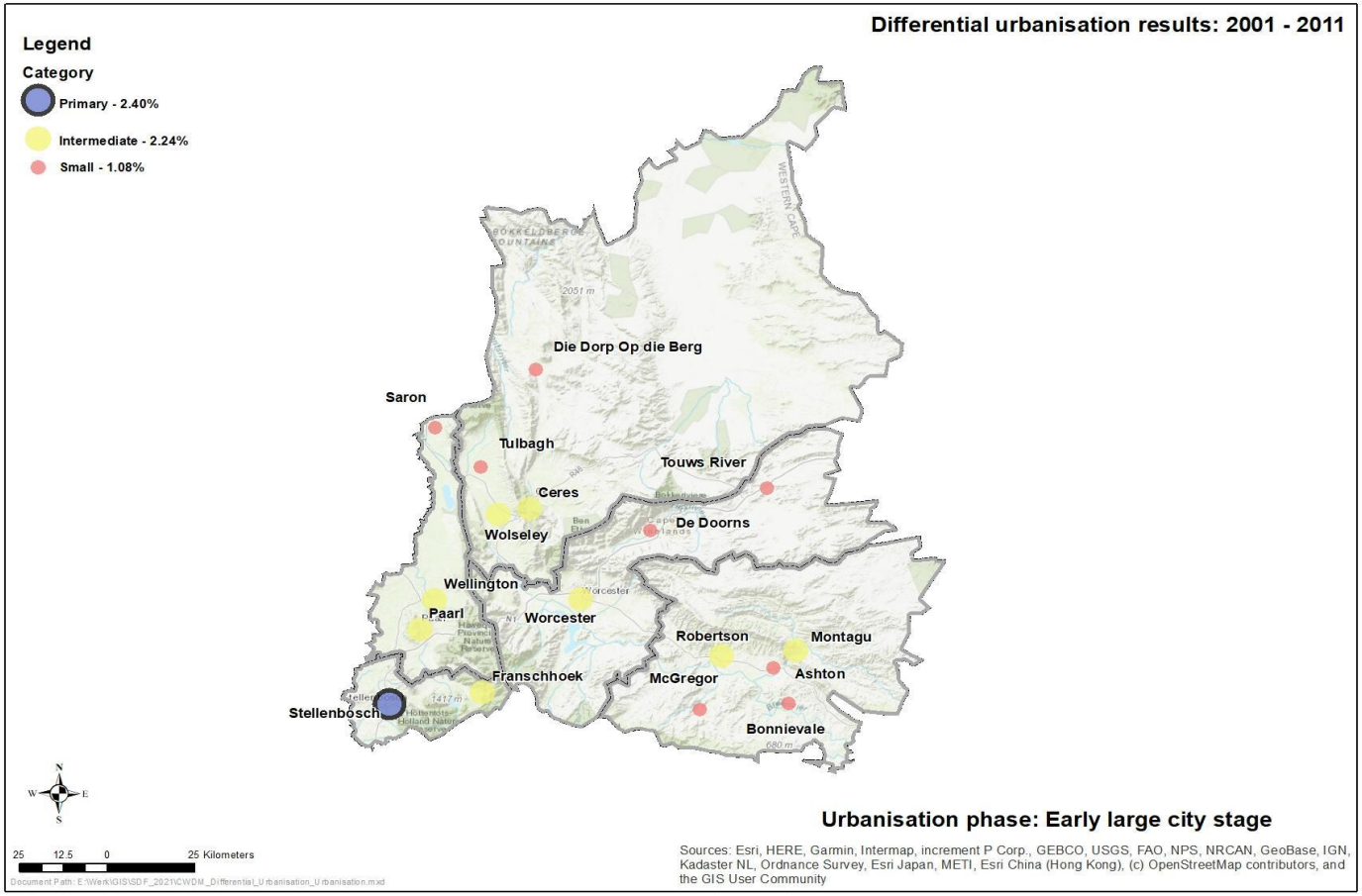
DU model classification			
Pattern	CU	U	PR
Stage	V	I	IV
Urban Development cycle	1	2	2

LEGEND		
Pattern	**Stage**	**Urban Development Cycle**
U: Urbanisation PR: Polarisation reversal CU: Counter-urbanisation	I - Early large city stage II - Advanced large city stage III - Early intermediate city stage IV - Advanced intermediate city stage V – early small city stage VI - Advanced small city stage	

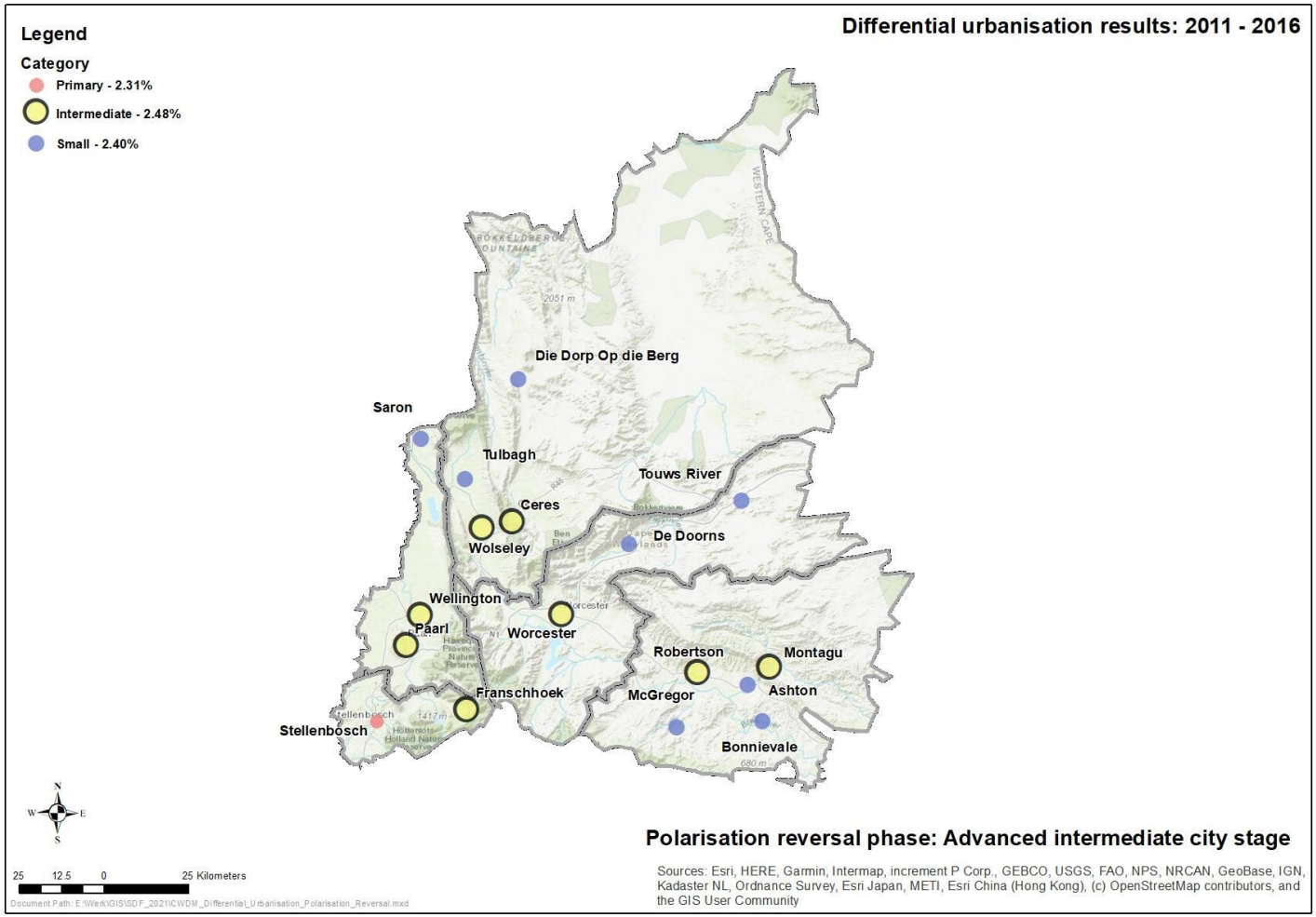
Period 1996 – 2001: The Cape Winelands District Municipality's urban system went through a counter urbanisation stage where the growth of small settlements was higher than those of the primary and intermediate settlements. Intermediate settlements had a higher growth rate than the primary settlements which puts the urban system in the (V) early small city stage between 1996 and 2001 (refer to map 2 below).



Period 2001 – 2011: The Cape Winelands District Municipality's urban system went through urbanisation where the growth of primary settlements was higher than those of the intermediate and small settlements. As the intermediate settlements had higher growth rates than the small settlements, the urban system went through the (I) early large city stage between 2001 and 2011 (refer to map 3 below).



Period 2011 – 2016: The Cape Winelands District Municipality's urban system went through polarization reversal where the growth of intermediate settlements was higher than those of primary and small settlements. On average the growth of intermediate settlements had a higher growth rate than small settlements, putting the urban system at the (IV) Advanced intermediate city stage. Intermediate settlements in Langeberg Municipal such as Montague (2.48%) and Robertson (2.56%) had high growth rates. This is however surprising as the growth rate of some of the small settlements seems to be higher than the intermediate settlements such as in Tulbagh (3.20%) and even more surprisingly in a place like Mc Gregor (2.49) and De Doorns (2.27%). Refer to map 4, below.



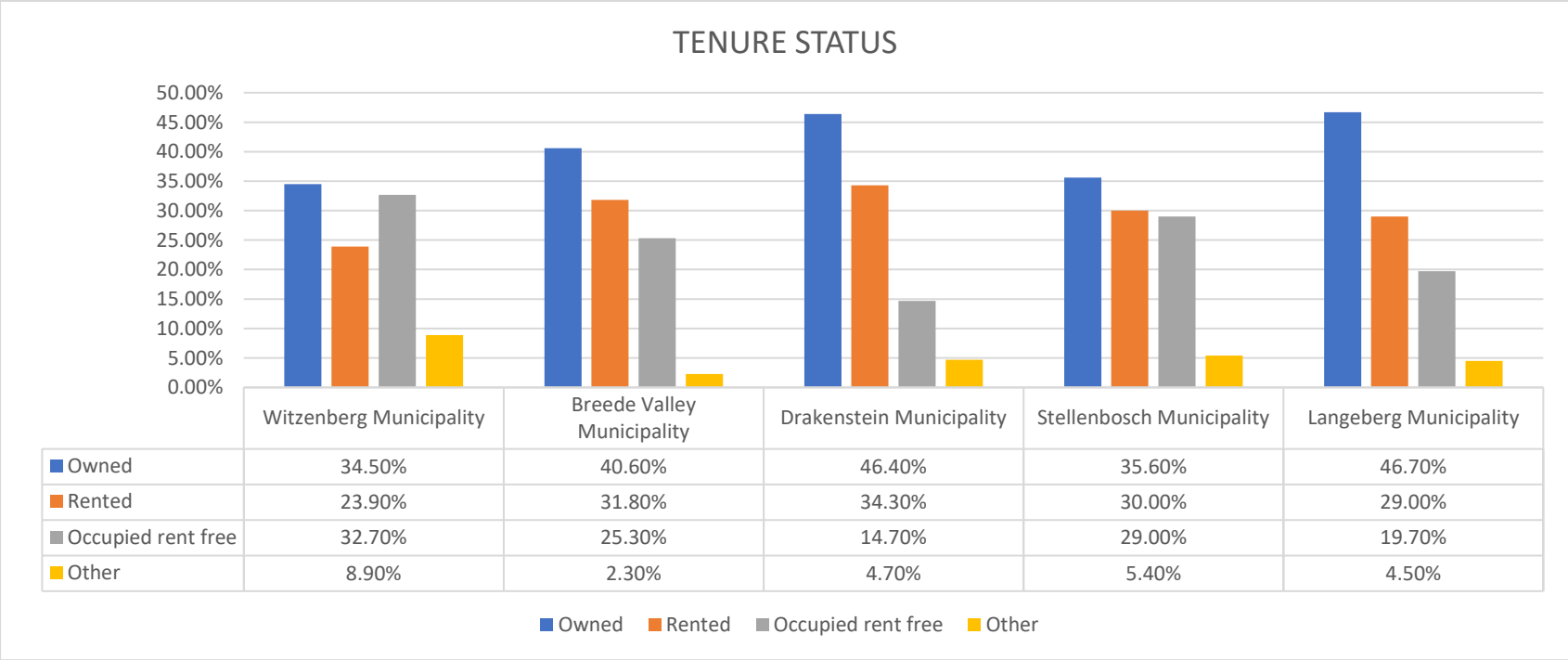
As of 2021, we are potentially in a continuous polarisation reversal phase. The anticipated settlements that will have transitioned to the population threshold-based settlement classification "primary regional service centre" based on population projections are Ceres, De Doorns and Robertson (these three

settlements transitioned between 2011 and 2016) and Franschhoek, Montagu (projected date, 2026) with Wolseley being projected to transition at a later stage.

2.1.2 Population growth: Municipal Services

Population growth have an impact on the provision of housing and related municipal services. It must however be stated that population growth is not entirely because of migration, population growth is the outcome of positive population change which occurs when net migration plus live births minus deaths is positive (Stats SA 2011:22).

Graph 3: Tenure of residential property/dwelling units in the CWDM (Statistics SA 2011).

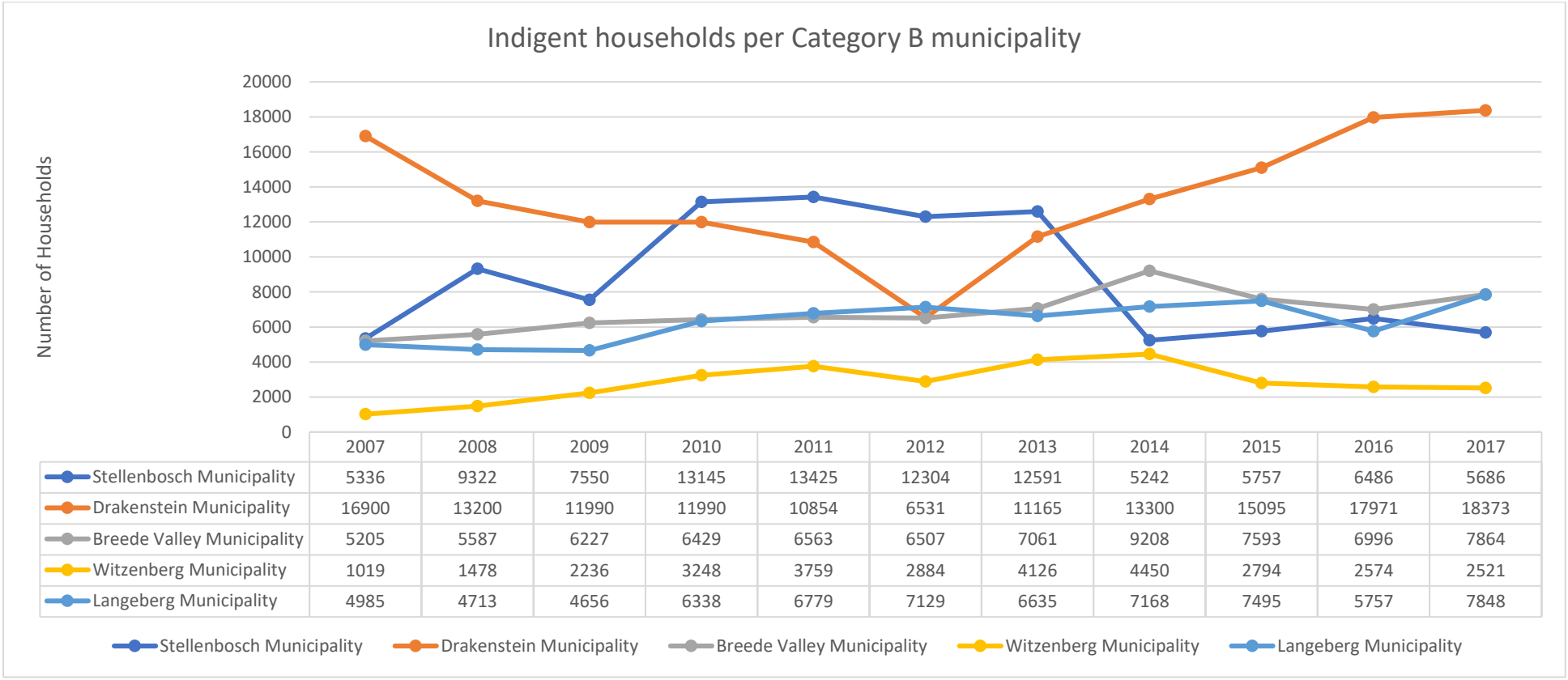


	Witzenberg Municipality	Breede Valley Municipality	Drakenstein Municipality	Stellenbosch Municipality	Langeberg Municipality
Owned	34.50%	40.60%	46.40%	35.60%	46.70%
Rented	23.90%	31.80%	34.30%	30.00%	29.00%
Occupied rent free	32.70%	25.30%	14.70%	29.00%	19.70%
Other	8.90%	2.30%	4.70%	5.40%	4.50%

It can be argued that poorer households are concentrated between the occupied rent free, rented and other category. The urban poor who are dependent on government grants struggle with affordability issues causing people with formal housing in urban areas to move back to informal structures (Todes et al. 2010: 345). This is evident in the increase of Informal settlements and dwellings throughout the district.

The absorption of poorer internal migrants into the urban footprint of urban settlements compounds challenges of a growing indigency. Such poor/poorer households require free basic services such as water, electricity, sanitation and refuse removal which classifies them as indigent households (DPLG 2005:30).

Graph 4: Indigent household reporting between 2007 and 2017.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Stellenbosch Municipality	5336	9322	7550	13145	13425	12304	12591	5242	5757	6486	5686
Drakenstein Municipality	16900	13200	11990	11990	10854	6531	11165	13300	15095	17971	18373
Breede Valley Municipality	5205	5587	6227	6429	6563	6507	7061	9208	7593	6996	7864
Witzenberg Municipality	1019	1478	2236	3248	3759	2884	4126	4450	2794	2574	2521
Langeberg Municipality	4985	4713	4656	6338	6779	7129	6635	7168	7495	5757	7848

The trend of municipal reporting shows a fluctuation of households reported. This could be due to improper reporting due to a lack of consultations aimed at gathering data/information for reporting.

Equitable share allocations and conditional grants are crucial to the financial sustainability of municipalities. The completion of indigent household registers has implications for calculating the equitable share allocation transferred from the national fiscus, municipalities must therefore prioritise completing indigent household registers. The equitable share allocation to which municipalities are constitutionally entitled, can supplement cost recovery rates (Verwey 2008:32).

2.1.3 Potential risks associated with population growth and migration:

It is essential to guard against risks that manifests with population growth with specific emphasis on migration and the difficulties of migrants assimilating into regions that is culturally different. The impact of a growing labour-intensive agricultural sector that is making use of brokers whom source labourers from outside the province and the influx of foreign nationals is a common phenomenon in the CWDM area. Apart from impacts mentioned, the ability of municipalities and government to provide housing and related services remains nearly an impossible challenge.

Social conflict is highlighted in the CWDM Risk Assessment Report (2014) as being an 'extremely high-risk priority'. Early warning signals are identified as follow:

- Sudden demographic changes and population displacement
- Increasing population resulting in rising unemployment rates
- An increase in numbers of demonstrations or rallies especially around local elections
- An increase in new faces in the area, i.e., strange people attempting to organise unrest
- Organised land invasions
- Dissent with regard to new housing developments and allocations in areas
- Increase in foreign immigration
- Increase in spaza (informal) shops owned by foreign nationals in townships

2.1.4 Key findings: Population Growth and Migration

2.1.4.1 Stellenbosch and Drakenstein Municipalities will continue to have high population growth rates due to being located in the functional region of the metro economy. Witzenberg and Langeberg Municipalities have the strongest Agricultural sectors in the CWDM, the labour-intensive nature of this sector could have contributed to the higher population growth rates that occurred during certain periods. The PSDF (2014) indicates that between 2006 and 2011, the province received a net gain of 225 657 people from which 80% were because of migration. It is essential that long term population growth projections must be done.

2.1.4.2 The CWDM area has 48 621 indigent households according to the Municipal Economic Review and Outlook (MERO, 2020), this figure will most likely increase considering the continuous migration of poorer migrants that are dependent on government grants as well as the rampant impact of the Covid-19 pandemic. The proposed population projections will enable government to determine growth hotspots and plan accordingly for essential services to mitigate potential risks relating to social conflict.

2.1.4.3 Due to the labour-intensive nature of commercial farming, Commercial farmers source labour from Lesotho, Swaziland, Rural Eastern Cape etc. due to local inhabitants listed on databases from the Department of Labour not being interested in the opportunities presented in the agricultural sector. The potential impact of this is workers settling permanently in the relevant areas i.e., Ceres Koue Bokkeveld located in Witzenberg Municipality, De Doorns located in Breede Valley Municipality, and Langeberg municipal area. This creates further issues in terms of housing provision and related indigent household services.

2.1.4.4 The application of the Differential urbanisation model suggests that intermediate settlements had the greatest increases in population albeit not by much, primary settlements (2.31%), intermediate settlements (2.48%) and small settlements (2.40%). The benefit of determining this trend is to have an idea of the movement of people within a specific geographic area that consist of the various urban settlements.

2.1.5 Implementation proposals:

RESPONSIBILITY:	FOCUS AREA: POPULATION GROWTH AND MIGRATION
CWDM, Category B Municipalities & PGWC, DEADP	1. Population growth projections must be done at least every five years to determine future population growth and hotspots.

Witzenberg, Breede Valley & Langeberg Municipalities	2. The municipality must play a facilitative role and assist Commercial farmers in Witzenberg, Breede Valley and Langeberg municipalities with the recruitment of local unemployed people registered on the database of the Department of Labor.
CWDM & Category B Municipalities	3. Social conflict risks and early warning signals associated with migration must be included in municipal Integrated development plans and spatial development frameworks. Refer to the CWDM Risk Assessment Report (2014).
Category B Municipalities	4. Indigent household registers must be updated on a regular basis to keep up with new entrants into a municipal area.
Category B Municipalities	5. Facilitate the movement of households to larger urban areas as it may be as relevant as ad hoc social support and improvements in the most basic infrastructure services.
PRIORITY:	HIGH
INDICATORS	1. Does irregular reporting of indigent households occur in municipalities? Note: This will be determined by annual fluctuating figures. The trend of reporting should follow a continuous incline, continuous decline or a constant trend.
	2. Does MSDF's include population projections per settlement?

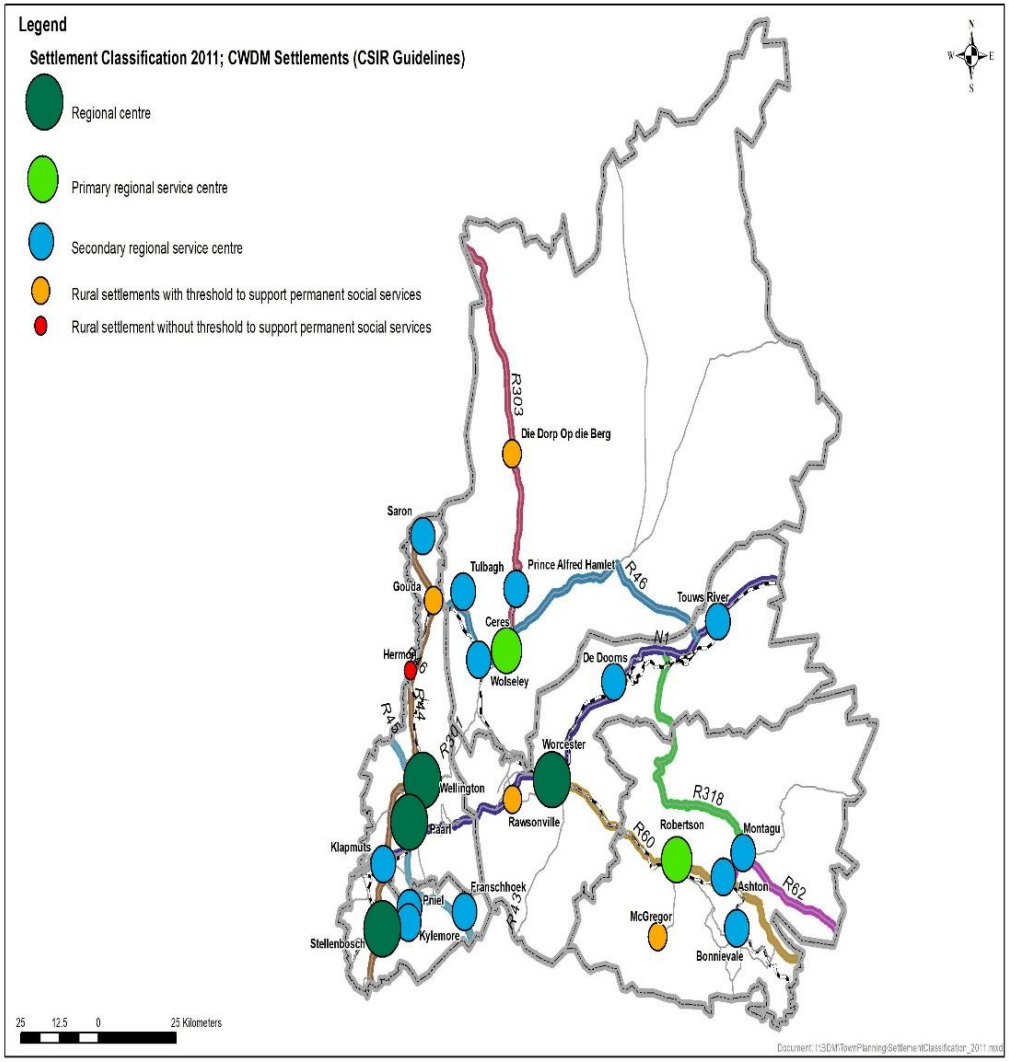
2.2 HIERARCHY OF TOWNS

Settlement classification based on the CSIR guidelines remains an important indicator of the distribution of existing primary social facilities in relation to settlement thresholds.

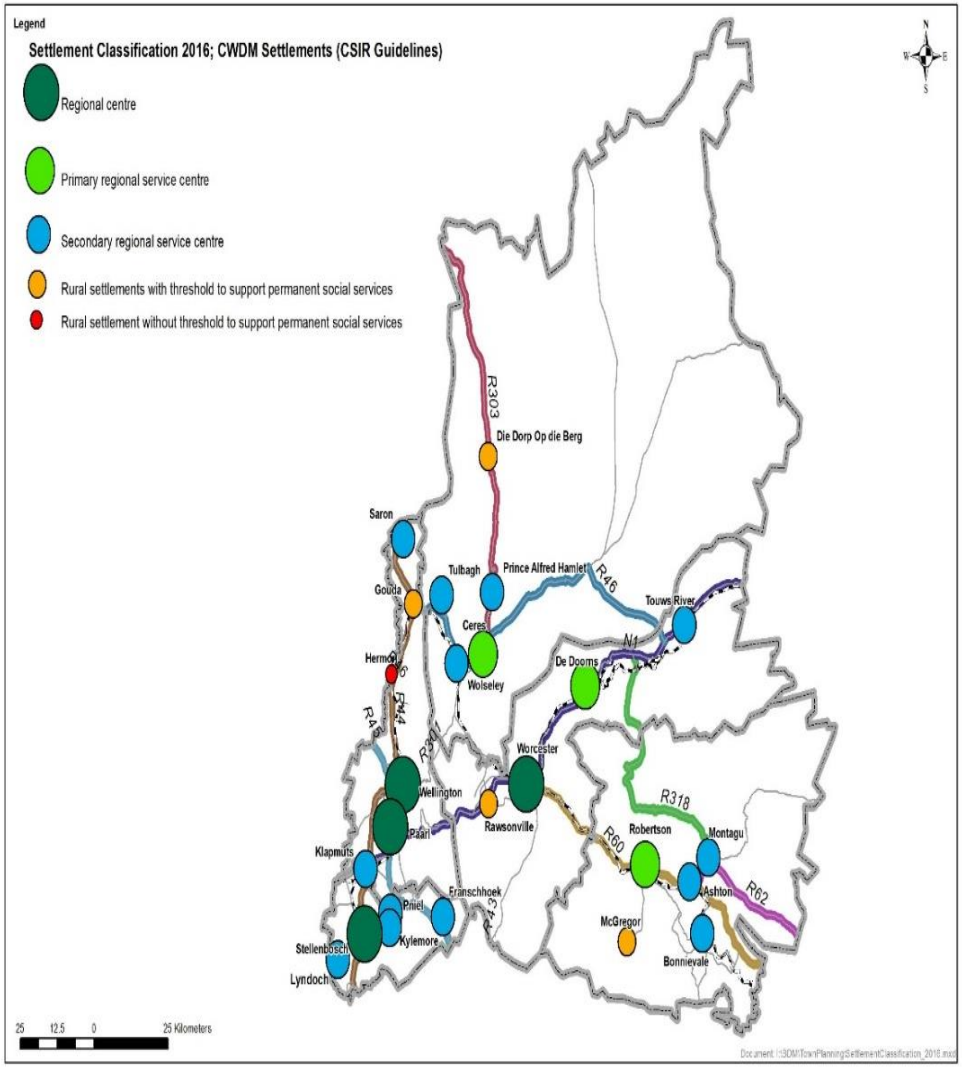
Table 7: PSDF 2014, Settlement Classifications; CWDM Settlements (CSIR Guidelines), Projections based on "Draft Data Estimate percentages, Data source: Statistics South Africa & Western Cape DEA&DP".

Settlements Classifications based on 2011 populations statistics (Stats SA)	**Population Thresholds**	**Population, Community Survey (2016)**	**Population projection (2026)** ***Note: population figures per settlements are estimates***
REGIONAL CENTRE Paarl/Wellingtonl, Stellenbosch, Worcester,	**>70 000**	**REGIONAL CENTRE** **Paarl:** 126 975 **Stellenbosch:** 89 903 **Wellington:** 63 557+35 089 **Worcester:** 104 527	**REGIONAL CENTRE** **Paarl:** 162 539 **Stellenbosch:** 112 858 **Wellington:** 83 771+45 357 **Worcester:** 121 308

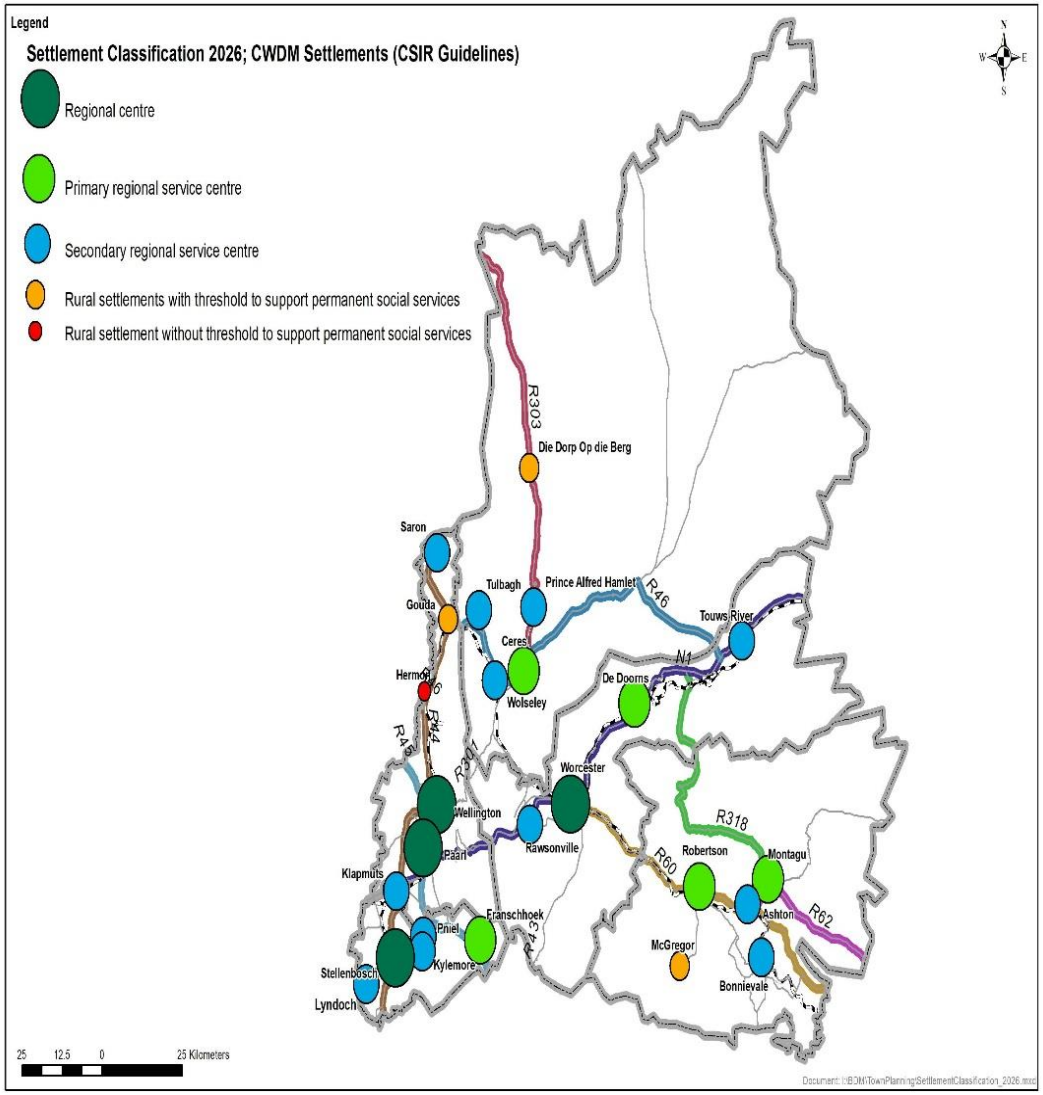
PRIMARY REGIONAL SERVICE CENTRE Ceres, Robertson	**>20 000-70 000**	**PRIMARY REGIONAL SERVICE CENTRE** Ceres: 36 043 Robertson: 30 675 De Doorns: 20 586	**PRIMARY REGIONAL SERVICE CENTRE** Ceres: 42 243 Robertson: 37 761 De Doorns: 26 352 Franschhoek: 21 692 Montagu: 23 587
SECONDARY REGIONAL SERVICE CENTRE Ashton, Bonnievale, **De Doorns,** Montagu, Klapmuts, Kylemore, Pniel Lyndoch Prince Alfred Hamlet, Saron, Touwsriver, Tulbagh, Wolseley, Franschhoek	**>5000-20 000**	**SECONDARY REGIONAL SERVICE CENTRE** Ashton: 14 133 Bonnievale: 10 229 Montagu: 17 551 Klapmuts: 9 495 Kylemore, Pniel, Lyndoch:12 031 Prince Alfred Hamlet: 8 455 Saron: 8 781 Touwsriver: 8 768 Tulbagh: 10 307 Wolseley: 14 276 Franschhoek: 17 450	**SECONDARY REGIONAL SERVICE CENTRE** Ashton: 15 924 Bonnievale: 12 967 Klapmuts: 14 466 Kylemore, Pniel, Lyndoch: 15 552 Prince Alfred Hamlet: 13 005 Saron: 11 023 Touwsriver: 13 231 Tulbagh: 13 585 Wolseley: 19 752 Rawsonville: 5047
RURAL SETTLEMENTS WITH THRESHOLD TO SUPPORT PERMANENT SOCIAL SERVICES Gouda, McGregor, Op Die Berg, Rawsonville,	**>1000-5000**	**RURAL SETTLEMENTS WITH THRESHOLD TO SUPPORT PERMANENT SOCIAL SERVICES** Gouda: 3878 McGregor: 3493 Op Die Berg: 1843 Rawsonville: 3648	**RURAL SETTLEMENTS WITH THRESHOLD TO SUPPORT PERMANENT SOCIAL SERVICES** Gouda: 4916 McGregor: 4342 Op Die Berg: 2676
RURAL SETTLEMENT WITHOUT THRESHOLD TO SUPPORT PERMANENT SOCIAL SERVICES Hermon	**< 1000**	Hermon	Hermon



Map 5: CWDM Settlement Classifications 2011 (PSDF 2014)



Map 6: CWDM Settlement Classifications 2016 (based on Community Survey)



Map 7: CWDM Settlement Classification 2026 (based on projections)

2.2.1 Regional Centres

The CWDM has four regional centres that fulfils the following functions:

Stellenbosch; Southern Winelands service & admin centre, tertiary education & research, agri processing, multi-national HQs, tourism destination, tech industry, very high growth potential.

Paarl-Wellington; Northern Winelands service & admin centre, tertiary education, agri processing & distribution, tourist destination, very high/high growth potential.

Worcester; Northern Boland service centre, admin centre, N/S & E/W regional logistics hub, specialist disability treatment, tertiary education, agri processing & distribution, high growth potential.

Stellenbosch and Paarl/Wellington falls within the functional region of the metro economy. These nodes' function more as an extension of the metropolitan area rather than being significant centres for services and goods to the surrounding countryside. Worcester remains an important, and probably the only, 'major regional service centre' due to easy accessibility from surrounding towns and towns located in the Langeberg & Witzenberg municipal area.

Both Stellenbosch and Drakenstein Municipalities have identified Klapmuts as a prospective sub-regional urban node along the N1. Residential and industrial development opportunities have been identified north and south of the N1, and the area has also been identified as having potential

to serve as a regional freight logistics hub. Stellenbosch and Paarl/Wellington falls within the functional region of the metro economy.

2.2.2 Primary Regional Service Centre

Ceres; Agricultural regional service centre, regional gateway to Tankwa Karoo, Koue and Warmbokkeveld, administrative centre, linkages to N1.

Robertson is the largest town in Langeberg Municipality with the broadest economic base and fulfil an important role as service centre/agricultural service centre.

De Doorns; Although De Doorns is not viewed as an administrative centre due to a lack of associated functions, it has a population of > 20 000 plus people due to a strong labour-intensive agricultural economy based on export grapes. The town has religious, health, educational and services/shopping facilities.

2.2.3 Other Municipal Towns

The development of towns (district wide) is rooted in their role as service centres for the surrounding agricultural environment as rural communities need a centrally located core town for religious, health, educational and services/shopping facilities, as well as a market for their products. Apart from the economics that drive the growth and development of these towns, aspects regarding technological innovation, the environment, the particular spatial location, cultural patterns and management systems also play a role. Thus, each municipal area in the district has distinct growth forces and historically evolved relations between the towns, villages and neighbourhoods, which will shape the potential for future growth. It is critical for pro-growth (and pro-poor) municipal strategies that these towns and their development potential are taken into account.

Table 8: Social Facilities (CSIR Guidelines for the Provision of Social Facilities in South African Settlements, 2012)

Categories	Facilities
Health & Emergency Services:	Tertiary, Regional and District Hospital
	Community Health Centre
	Primary Health Clinic
	Fire Station
	Police Station
Social and Cultural (Public Service)	Performing Arts Centre
	Museum
	Library
	Civic Centre/City Hall Major Public Event Venue
	Home Affairs Office
	Thusong Centre
Civic Services	Labour Office
	Magistrate's Court
	Municipal Office
	Prison and Place of Safety
	Solid Waste Disposal Site and Recycling Depot
	Community Hall
	Children's Home
	Home for the Aged
	Hospice and Health Centre
	ICT Access Points
Social Services	Post Office/Agency and Post Boxes
	South African Social Security Agency (SASSA) Office and Social Grant Pay Point
	Cemetery and Crematorium
	Informal Urban Agriculture
	Local Market
	Worship Centre
Education Services	Further Education and Tertiary Institutions
	Special Education
	Secondary School
	Primary School
	Early Childhood Development (ECD): Grade R
	Early Childhood Development (ECD): Crèche
	Early Childhood Development (ECD): Resource Hub and Care Centre
Parks and Recreation Services	Parks
	Sports and Recreation: Overall Allocations for Sports Fields and Facilities

2.2.4 Key findings: Hierarchy of Towns

2.2.4.1. Settlement classification of CWDM towns per the PSDF (2014) based on the CSIR Guidelines is essential to indicate the distribution of existing primary social facilities in relation to settlement thresholds. This in tandem with population growth projections will assist government/municipalities in determining which towns are in a transition to a new classification (higher/lower order) which will in turn determine the types of social facilities that is needed.

2.2.4.2. The Western Cape Province does not have a uniform settlement classification system. Municipalities apply different types of classifications to settlements in their areas of jurisdiction. These classifications differ in defining the functionality of settlements. It is important to have a uniform set of classifications that determines functionality and guide budgeting. The uniform system of settlement classifications must preferably be aligned to the National Spatial Development Framework (NSDF) classifications which national treasury uses to calculate budgetary funding.

2.2.5 Implementation proposals:

RESPONSIBILITY:	FOCUS AREA: HIERARCHY OF TOWNS
CWDM & Category B Municipalities	1. Settlements that are in transition to a higher/lower order classification because of quantitative changes in population growth as per the CSIR Settlement Classifications must be determined and included in municipal spatial development frameworks and integrated development plans well in advance to ensure that sufficient planning is done.
PGWC, CWDM & Category B Municipalities	2. Ensure higher levels of sustainable growth through, *inter alia*, focusing investment and development on a number of significant urban areas (according to a hierarchal order), whilst maintaining rural integrity and ensuring biodiversity conservation; to use growth as a catalyst to address poverty alleviation, spatial restructuring and the safeguarding of sustainability
PGWC, CWDM, Stellenbosch & Drakenstein Municipalities	3. Consider and incorporate the growth and development of Cape Town as critical informant for regional planning and implementation
PGWC, DEADP	4. Develop uniform settlement classifications that is preferably aligned to the NSDF classifications.
PRIORITY:	HIGH
INDICATORS	1. Has provincial government compiled a settlement classification guiding document that will ensure that uniform designations are being applied throughout the WC province? 2. Has uniform settlement classifications been applied throughout the CWDM via MSDF's?

2.3 GROWTH POTENTIAL OF TOWNS

The Growth Potential Study (2013) determined the following growth potential for municipalities and towns in the Cape Winelands district based on assessing five thematic indices, namely: human capital, infrastructure availability, economy, physical attributes, and institutional capacity (refer to table 8 below);

Table 9: Growth Potential and Socio-Economic Needs of CWDM Towns (GPS 2013).

B Municipalities:	Growth Potential: Settlement level	Growth Potential: Municipal level	Socio-economic needs
WITZENBERG		**Low, *Medium (GPS 2018)***	
Ceres	*Medium, **Very High (PSDF2014)***		**High, *Very High (PSDF 2014)***
Prince Alfred Hamlet	Medium		Medium
Op die Berg	Low		Medium
Tulbagh	Low		Medium
Wolseley	Low		Medium
LANGEBERG		**Medium**	
Montagu	Medium		Medium
Ashton	Medium		Medium
Robertson	Medium		**High**
MgGregor	Medium		Very low
Bonnievale	Medium		Medium
BREEDE VALLEY		**Medium**	
Worcester	**High**		**Very high**
Rawsonville	Medium		Low
De Doorns	Low		Low
Touwsrivier	Very low		Low
DRAKENSTEIN		**Very high**	
Paarl	**Very high**		**Very high**
Wellington	*Medium, **Medium -High (PSDF 2014)***		**Very high**
Gouda	Medium		Very low
Saron	Medium		Low
STELLENBOSCH		**Very high**	
Stellenbosch-Jamestown	**Very-high**		**Very high**
Pniel-Kylemore	**High**		Low

Franschhoek	Medium		Medium
Klapmuts	*Medium), **Very High (PSDF 2014)***		Low, ***Very High (PSDF 2014)***

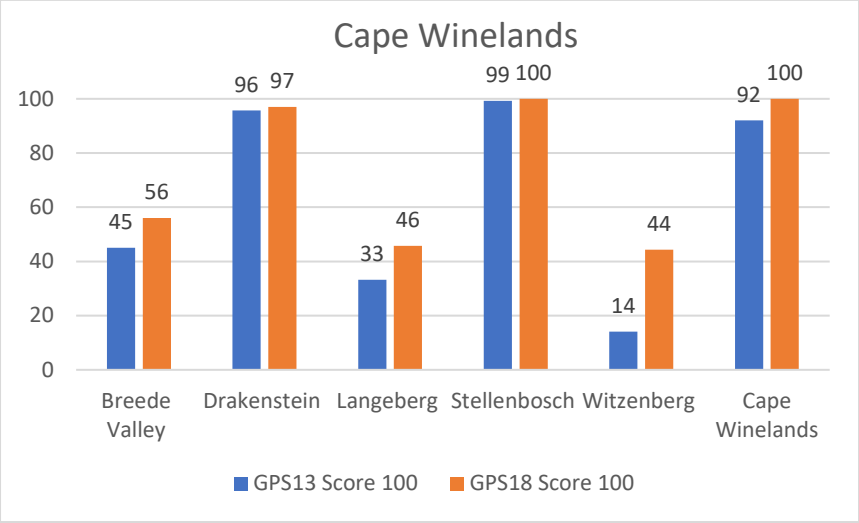
The CW SDF does not propose an investment typology. Municipalities must assess settlements individually and consider strengths and weaknesses in terms of the thematic indices. The GPS provides a comprehensive profile for each settlement based on 85 individual indicators. The information generated from these assessments can inform strategies and projects aimed at addressing the weaknesses of individual settlements and optimising the strengths to unlock opportunities for growth and development. These assessments are crucial and must be prioritised. Detail planning and broad consultations that include all stakeholders (private sector, government etc.) must have parity on the way forward.

The PSDF (2014) identifies Stellenbosch, Klapmuts, Paarl, Ceres and Worcester as settlements that have very high growth potential and very high social needs. This is a deviation from the GPS (2013). The deviation is specifically aimed at Ceres and Klapmuts. Reasons given are based on the relationship between areas of urban growth pressure and important natural and agricultural resources. Ceres as a primary regional service centre's growth outlook is strengthened by having a strong and potentially growing agricultural sector. Klapmuts, on the other hand, is near Stellenbosch, Paarl and the City of Cape Town. Klapmuts together with Paarl and Stellenbosch is located within the functional region of the Metro Economy. Wellington is viewed by the draft GCMRSIF as a regional node in tandem with Paarl and has a very high/ high growth potential. This regional node fulfils a service, tertiary education, agri processing & distribution, tourist destination and administrative centre function for the northern winelands region.

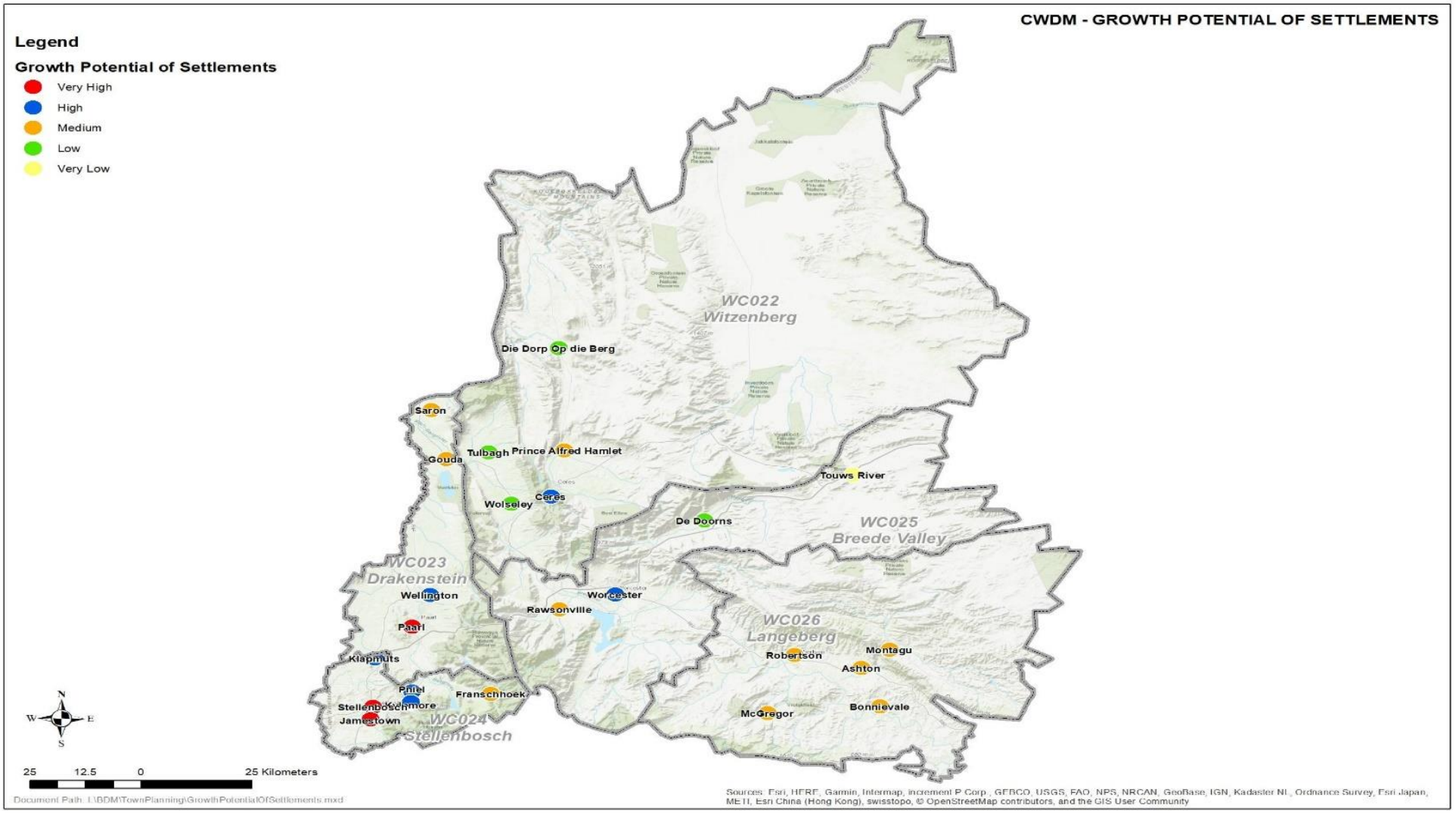
The Growth Potential Study update (GPS 2018), states that the CWDM is 1st amongst the 5 Districts in the Western Cape Province in all themes observed relating to growth preconditions and innovation potential. Growth preconditions are determined by the following indicators, *economic*, *physical* and *infrastructure* whilst innovation potential is determined by *institutional* and *human capital* indicators. The GPS (2018) observes that all category B municipalities had an increase in growth potential since the release of the GPS (2013). Indicators that showed a positive increase in performance are "infrastructure" and "institutional". Infrastructure areas of increased performance to exploit for development include, *land availability and use*, *transport and communication* and *availability of municipal infrastructure*. Institutional areas of increased performance are *quality of governance*, *safety and security*, *administrative and institutional function* and *availability of municipal infrastructure*.

"Z Score-100" linked to the themes (thematic indices) has increases as is observed in the graph below.

Graph 5: CWDM Municipal Growth Potential Score100.



The Stellenbosch and Drakenstein municipal areas were classified "very high" in terms of their development potential while the Breede Valley, Langeberg and Witzenberg municipal areas were classified as having "medium" development potential. The Stellenbosch and Drakenstein municipal areas were ranked first and second respectively compared to other municipal areas in the province in terms of their development potential. The Witzenberg municipal area experienced gains in its growth potential as it improved from "low" to "medium", experiencing the highest real increase across the province and made gains in its institutional theme. The Breede Valley as well as the Drakenstein municipal areas also experienced an improvement in the institutional theme, while the Langeberg municipal area observed gains in the human capital and institutional themes. In the institutional theme, while the Langeberg municipal area observed gains in the human capital and institutional themes.



Map 8: CWDM Growth Potential of Towns. The designations are informed by the GPS (2013), PSDF (2014) and draft GCMRSIF

2.3.1 Key findings: Growth Potential of Towns

2.3.1.1 Ceres as a primary regional service centre's growth outlook is strengthened by having a strong and potentially agricultural growing sector According to Witzenberg Municipality, the agricultural sector economy located within the Warm & Koue Bokkeveld are going to grow with 20-30% within the next five years. Farmers have planted new orchards etc. that will produce fruit within the mentioned period. The challenge for the municipality is the provision of adequate services and possible industrial land for cold storage facilities. The town of Ceres is further constrained by a lack of land for urban expansion. The expansion of the agricultural industry and in-migration must be monitored as can be seen from the high population growth percentages.

2.3.1.2 The Growth Potential Study (2013) determined growth potential for municipalities and towns in the Cape Winelands district based on assessing five thematic indices, namely: human capital, infrastructure availability, economy, physical attributes, and institutional capacity. Municipalities must assess settlements individually and consider strengths and weaknesses in terms of the thematic indices. The latter will potentially highlight opportunities for investment.

2.3.1.3 Stellenbosch, Paarl and Wellington are located within the functional metro economy of Cape Town. These towns' function more as an extension of the metropolitan area, people live in the metro and work and make use of services in these towns and vice versa. The economic growth outlook will therefor always remain positive although the long-term impact of a "drying" Cape Winelands region is not known at this stage.

2.3.1.4 GPS (2018) observes an increased growth potential for each category B municipality in the CWDM. Witzenberg Municipality's growth potential changes from low to medium whereas the other municipal growth potential, Langeberg, Breede Valley remains medium albeit with higher Zscores and Stellenbosch and Drakenstein similarly remain very-high albeit with higher Zscores when comparing to the GPS (2013).

2.3.1.5 GPS (2018) identifies the following challenges:

- Water security in the Breede Valley municipal area is a concern and must be monitored.
- The state and capacity of wastewater treatments works in the Langeberg and Witzenberg municipal areas.
- Observed regression in crime related to issues in the Witzenberg municipal area.
- Observed slowing down in medium-term economic growth in the Drakenstein municipal area.

2.3.2 Implementation proposals:

RESPONSIBILITY:	FOCUS AREA: GROWTH POTENTIAL OF TOWNS
Category B Municipalities	1. The thematic indices that were used to score municipalities and settlements in terms of potential for economic growth must be analysed. The high scoring thematic indices will present opportunities for investment and vice versa, the low scoring thematic indices will present strategic opportunities for investment that could improve the growth potential of a municipal area or settlement.
Category B Municipalities	2. Integrate disadvantaged communities into the urban fabric through infill development on strategically located vacant land and corridor development along the main linkages between these communities and the major concentrations of job opportunities (where possible)
Refer to mentioned Category B Municipality	3. GPS (2018) strategic considerations: 4.1 Growth in the economically active population in the Breede Valley municipal area can be exploited. 4.2 There is potential for growth in revenue and expenditure in the Drakenstein and Stellenbosch municipal areas. 4.3 Opportunities present in the Stellenbosch and Drakenstein areas due to residents' access to ICT. 4.4 Opportunity for future economic potential in the Witzenberg and Langeberg municipal area, resulting from observed medium-term economic growth.
PRIORITY:	HIGH

2.4. INTEGRATED HUMAN SETTLEMENTS

Efficient settlements are underpinned by 'good' and effective governance/ municipal decision making, utilizing structural elements and existing resources efficiently to deal with legacy challenges (apartheid spatial layout of towns) and the availability of infrastructure. SPLUMA (16 of 2013) is founded on the development principle of efficiency whereby, "land development optimises the use of existing resources and infrastructure; decision-making procedures are designed to minimise negative financial, social economic or environmental impacts; and development application procedures are efficient and streamlined and timeframes are adhered to by all parties". The CW SDF embraces this as a key principle to enable efficient settlement.

The CWSDF will also build upon the three (3) frameworks and Gazetted Housing Act Declaration of 136 that are mentioned below;

a) The Greater Cape Metro Regional Spatial Implementation Framework (2019)

The GCMRSIF identified the following structural deficiencies which is applicable to most of the settlements in the CWDM, these structural deficiencies include;

- Pervasiveness of socio-spatial segregation,
- Sprawling and low-density multi-nodal network of settlements,
- Mismatches between where people live and work,
- Isolated concentrations of poverty severed from economic opportunities, and
- Underinvestment in public transport and freight infrastructure, making the region inaccessible to most residents and inefficient for business to operate in.

b) The Integrated Urban Development Framework (2016)

The Integrated Urban Development Framework (IUDF) provides Government's policy framework for transforming and restructuring South Africa's urban spaces. It is guided by the vision of creating 'liveable, safe resource-efficient cities and towns that are socially integrated, economically inclusive and globally competitive, where residents actively participate in urban life'.

In order to address the overall outcome of spatial transformation of the IUDF, the IUDF proposes an urban growth and management model premised on **compact, connected and coordinated cities and towns**. Yet it recognizes that the country has different types of cities and towns which have different roles and responsibilities. As such, the vision has to be interpreted and pursued in differentiated and locally relevant ways.

Strategic Goals:

1. **Spatial integration:** To forge new spatial forms in settlement, transport, social and economic areas
2. **Inclusion and access:** To ensure people have access to social and economic services, opportunities and choices
3. **Growth:** to harness urban dynamism for inclusive, sustainable economic growth and development
4. **Governance:** to enhance the capacity of the state and its citizens to work together to achieve spatial and social integration

The Strategic Goals inform the priority objectives of the nine policy levels, which are premised on the understanding that (1) integrated urban planning informs the basis of achieving integrated urban development, which follows a specific sequence of urban policy actions: (2) integrated transport that informs (3) targeted investments into integrated human settlements, underpinned by (4) integrated infrastructure network systems and (5) efficient land governance, which all together can trigger (6) economic diversification and inclusion, and (7) empowered communities; all of the above will demand effective (8) governance and (9) financial reform to enable and sustain these policy actions. The levers thus seek to address in combination the structural drivers that maintain the status quo.

c) The Provincial Spatial Development Framework (2014)

The PSDF (2014) proposes the following 'Settlement Policy Objectives' that must be implemented at municipal level. The 'Provincial Settlement Policy' objectives are to;

- Protect and enhance sense of place and settlement patterns
- Improve accessibility at all scales
- Promote an appropriate land use mix and density in settlements
- Ensure effective and equitable social services and facilities and
- Support inclusive sustainable housing.

d) Housing Act Declaration of 136 Priority Human Settlement and Housing Development Area (PHSHDA)

According to the Ministry Human Settlements (National Government), the PHSHDA intends to advance Human Settlements Spatial Transformation and Consolidation by ensuring that the delivery of housing is used to restructure and revitalise towns and cities, strengthen the livelihood prospects of households and overcome apartheid spatial patterns by fostering integrated urban forms.

The PHSHDAs are underpinned by the principles of the National Development Plan and allied objectives on the National Spatial Development Framework and the Integrated Urban Development Framework which includes;

a) Spatial Justice: reversing segregated development and creation of poverty pockets in the peripheral areas, integrate previously excluded groups and resuscitate declining areas.
b) Spatial efficiency: consolidating spaces and promoting densification and efficient communicating patterns.
c) Access to connectivity, economic and social infrastructure: ensure the attainment of basic services, job opportunities, transport networks, education, recreation, health and welfare to facilitate and catalyse increase investment and productivity.
d) Access to adequate accommodation: emphasis is on provision of affordable and fiscally sustainable shelter in areas of high need; and
e) Provision of quality housing options: ensure that different housing typologies are delivered to attract market segments of appropriate quality and innovation.

The Gazetted Housing Act Declaration of 136 PHSHDA dated 15 May 2020, identifies the following municipalities and 'places' in the CWDM:

a) Breede Valley Municipality; Worcester, Zwelethemba, Wards [6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21]
b) Drakentsein Municipality; Paarl-Wellington, Mbekweni, Wards [2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33]
c) Stellenbosch Municipality; Stellenbosch, Kaya Mandi and Jamestown, Wards [6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 21, 22]

The mentioned municipalities and places will form the basis for future allocation of grant funding by the national government.

2.4.1 THE MUNICIPAL FINANCIAL SERVICES MODEL (MSFM) [Read with Annexure 1]

The intention of the MSFM according to the PSDF (2014) is to investigate the impact of current spatial growth patterns of settlements on sustainability which include quantifiable financial impacts. Provincial spatial policy promotes the principles of urban compaction, integration and densification. Settlements however continue to sprawl peripherally as a result of decisions based on short term gains, be it political, economic or pragmatic.

The Municipal Financial Sustainability of Current Spatial Growth Patters was conducted as an informant into the 2014 PSDF. The objective of the Study was to investigate the impact of current spatial growth patterns on municipal sustainability in concrete and quantifiable terms. Provincial spatial policy has continuously promoted the principles of urban compaction, integration and densification yet our cities and towns continue to sprawl peripherally. Although the reasons for this continuous sprawl are complex, it is often a result of development decisions based on short-term gains. The study counteracts this short-term view with a longer-term perspective on what peripheral development does to the long-term financial sustainability of municipalities, as well as other non-financial impacts.

It provides sound economic and financial evidence to support the spatial principles of compaction and densification and provides weight to spatial plans in the decision-making process. The Study included applying the Municipal Services Financial Model[1] in seven case study municipalities. The model determined the municipal financial sustainability of two alternative spatial growth patterns namely: business-as-usual (BAU) and a compact scenario. The seven case study municipalities "were selected based on geographic spread and the degree to which they can be considered typical of their municipality category" and are included in the table below.

Table 10: Selected Western Cape Municipalities for the Municipal Financial Sustainability Model study.

Selected WC Municipality	Category
City of Cape Town	A
Stellenbosch; George	B1
Saldanha Bay; Overstrand	B2
Theewaterskloof; Beaufort West	B3

A general finding of the Study was that the capital available to fund new infrastructure for growth as well as the rehabilitation of existing infrastructure fall far short of the calculated capital requirements. The current spatial growth patterns (BAU) increase this capital funding gap substantially.

Another key finding was that the case study municipalities are all vulnerable on their operating accounts, and that interventions will have to be undertaken to sustain the financial viability of municipalities, even without further spatial growth. The cumulative net position was shown as negative for all the case study municipalities however this can be improved with compaction and densification. The implications of continuing urban sprawl in the province are that both capital and operating costs for municipalities will increase. Without an adequate increase in revenues to cover these costs, municipal financial viability will deteriorate at an ever-increasing rate over time. Through the provision of quantitative evidence, the Study concluded that the current spatial patterns are not sustainable for municipalities and are detrimental to the environment and the urban poor.

[1] The Municipal Services Financial Model (MSFM) projects the infrastructure requirements and associated revenue and expenditure over a 10-year timeframe, using a calibrated baseline situation. The baseline position was developed from municipal documents and interviews with officials, while the future projections were based on municipal targets and a number of other growth assumptions. The critical assumptions regarded the form and density of residential development, and changes to capital and operating unit costs under the two spatial growth scenarios.

Table 11: Aggregate financial modelling results for the Western Cape.

Measure	BAU	Compact	Difference	% Improvement
Total capital investment required over 10 years (R million)				
City of Cape Town	106,877	88,095	18,782	18%
B1s	8,598	7,281	1,317	15%
B2s	14,824	12,688	2,136	14%
B3s	13,951	11,837	2,115	15%
Total for Western Cape	**144,250**	**119,900**	**24,350**	**17%**
Sum of net operating position over 10 years				
City of Cape Town	-15,556	-12,836	-2,720	17%
B1s	-2,628	-2,017	-611	23%
B2s	-2,372	-1,792	-580	24%
B3s	-3,394	-2,569	-825	24%
Total for Western Cape	**-23,950**	**-19,214**	**-4,737**	**20%**

The results of the Study are presented in Table 10 above. The Study notes that an analysis of the results should focus on the overall provincial picture and not necessarily on the category results.

"The total capital cost premium attributable to the current spatial growth patterns (BAU) over the next 10 years is projected to be R24 billion, or 17%, when compared with an alternative, compact spatial form. The dominance of the City of Cape Town, and hence the significance of spatial form in this municipality, is clear from the results, with 77% of the savings coming from this municipality alone. The percentage savings in capital costs decreases with decreasing municipal size.

On the operating account, the cumulative net position is shown to be negative for all municipal categories, but this can be improved with densification. The improvement in the province as a whole is estimated to be 20%, with the largest possible improvement being seen in the smaller B2 and B3 municipalities, whose operating accounts are highly sensitive to expenditure increases." Taking the lead from the PSDF, the Cape Winelands District Municipality investigated the possibility of running the Municipal Financial Impact Analysis in the B-Municipalities that make up the Cape Winelands District; namely:

- Stellenbosch Municipality
- Drakenstein Municipality
- Breede Valley Municipality
- Witzenberg Municipality and
- Langeberg Municipality.

The main purpose of running the Municipal Financial Impact Analysis in the B-Municipalities is to generate baseline information against which decisions on development plans can be assessed. Find the Municipal Financial Impact Analysis attached as Annexure 1.

2.4.1.1 Implementation proposals for Annexure 1; Municipal Impact Analysis Cape Winelands, The Financial Impact of Spatial Growth Patterns.

RESPONSIBILITY:	FOCUS AREA: MUNICIPAL FINANCIAL SERVICES MODEL
Category B Municipalities	1. Ensure compaction, managing growth and clustering urban functions within the urban footprint; contain existing lower order settlements (including hamlets) within the current urban footprint except if extended or popular ventures can provide sustainable growth opportunities (e.g. Klapmuts); ensure that all new developments include a 'range of elements' that contribute to a more sustainable urban environment.
	2. Focus on improving functioning of settlements and achieving design standards; create and apply urban design guidelines for historic precincts within urban areas.
	3. Create sustainable and liveable urban environments by ensuring access and choice to urban markets, services, amenities, and provisions.
	4. Create integration of urban areas through physical (if possible) and socio-economic integration.
	5. Create a functional and sustainable urban open space network.
	6. Integrate the disadvantaged communities into the urban fabric through infill development on strategically located vacant land and corridor development along the main linkages between these communities and the major concentrations of job opportunities (where possible).
	7. Locate high density residential accommodation and business opportunities, from informal street trading to formal shops, offices and factories at the appropriate scale, around clusters of community facilities grouped at the appropriate scale
	8. Buildings that accommodate community activities, as well as education, health and entrepreneurial development and business and skills training, should be located at points of highest access in urban settlements.

	9. Compile neighbourhood plans for the higher-order towns in the district (to also consider the structure, function and purpose of neighbourhoods); complete community-based planning as a prerequisite for sustainable development.
	10. Promote the establishment of integrated development zones.
	11. Development plans must be developed for each of the gazetted PHSHDAs
PRIORITY:	HIGH.
INDICATORS	1. How many residential properties located in the urban edge has been subdivided for additional residential erwen and what is the average density?
	2. How many properties has been rezoned within the urban edge for higher density residential development (flats, group housing?
	3. Has different socio economic urban areas based on apartheid spatial planning boundaries been integrated physically through development/urban expansion?
	4. Has Development Plans been drafted for the gazetted PHSHDAs?

2.4.2 INTEGRATED DISTRICT PUBLIC TRANSPORT NETWORK:

The bulk of the population of the CWDM lives in and around Drakenstein and Stellenbosch municipalities. There are also a large number of people living on farms and in the rural hinterlands of the CWDM. The largest concentration of people is found in the main urban settlements of Stellenbosch, Paarl/Wellington, Worcester, Ceres and Robertson. Other urban settlements that continue to grow are De Doorns, Franschhoek, Wolseley and Montagu. Most of the CWDM has very low-density levels of persons per km².

The public transport services in the CWDM allow people to access destinations in their local area or other settlements to which they regularly travel, but which cannot be reached on foot or by other means of Non-Motorised Transport (NMT) modes. These destinations include essential services or activities accessed on a frequent basis, such as places of employment, shops, government services and schools. Public transport holds approximately 14% of the transport modal share, NMT 48% while 26% of people use private vehicles to reach their destinations in the CWDM

Table 12: Public Transport Services by Model

Mode	Type of Service
Train	Commuter service.
Bus	Mainly for the transportation of learners in terms of scholar bus contracts administered by the Department of Education.
Minibus-taxis	Commuter, scholar services and off-peak weekday services to shopping and hospitals/clinics.
Other Transport provided by farmers	Transport of farm workers over weekend to shops.
Department of Health fleet of vehicles	Serves various hospitals and clinics but mainly for own staff and transporting of medicine and medical equipment.

Currently the **Minibus-Taxi (MBT)** is the dominant public transport mode providing both commuter and long-distance services. MBT services operate predominantly out of the urban centres located within each municipality. Generally, it is these urban centres which are responsible for the majority of MBT passenger movements throughout the week. The Breede Valley and Drakenstein municipalities account for over 75% of total passenger demand in the CWDM.

Rail services within the CWDM are available in 4 local municipalities, namely Drakenstein, Witzenberg, Breede Valley and Stellenbosch municipality, and stop at 24 stations serving the CWDM. The CWDM have a train freight rail system which accommodates passenger transport. Commercial long-distance bus services that operate through the CWDM are those of InterCape, Greyhound, SA Road Link, and TransLux

Public transport infrastructure in the CWDM consists of 42 formal and 21 informal MBT and bus facilities and 3 formal air strips. Roughly half of the formal MBT rank facilities are off-street facilities, designed for MBT operations, with demarcated lanes and bays according to destinations. There are shelters and mostly some amenity facilities for passengers, but there is a need for both the construction of additional facilities as well as for the upgrade of the inadequate facilities in the CWDM. The N1 rail and road corridor and the Breede River Valley corridor are two major strategic corridors in the CWDM, and they are major distributors of people, goods and services from the CWDM to other municipalities within the Western Cape, to other provinces. These major corridors are supported by other

major roads (R44, R45, R46, R318, R303, R60, and R62) which distribute goods and services to the people within the DM (refer to Map 6 below, Major Transport routes). Map 9 (below): Major Transport Routes.

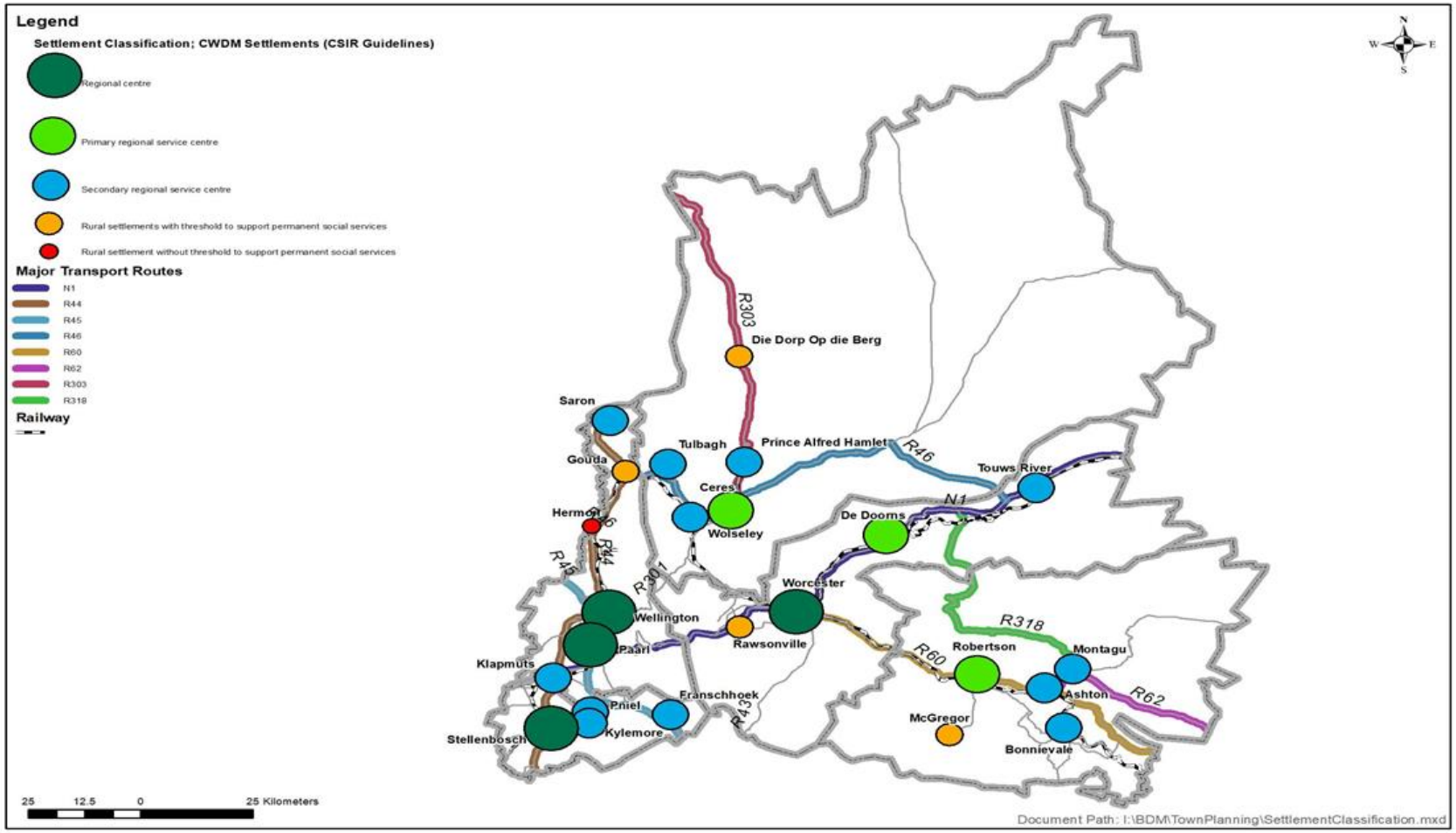


Table 13: Key Spatial Challenges per Local Municipality.

Local Municipality	Key Spatial Challenges
Drakenstein	• Lack of available land for transport and related infrastructure (Huguenot Station Precinct). • No park-and-ride facility at Huguenot Station. • Poorly defined transport and public spaces in Paarl Central Business District (CBD). • Key nodes (Wellington and Paarl) do not support NMT. • Poor transport-land use integration in Paarl CBD.
Stellenbosch	• Lack of integrated settlements within Municipality. • Dispersed rural settlements. • Derelict and unutilized rail infrastructure (Franschhoek rail connection). • Inter-city bus facilities are poorly located.
Breede Valley	• Poor transport-land use integration in Worcester CBD. • Worcester CBD does not support NMT. • Dispersed and non-integrated public transport facilities or ranks within • Worcester CBD (i.e. rail, long-distance bus, taxi). • Public transport services and facilities are non-existent or limited in rural areas.
Witzenberg	• Lack of integrated settlements, particularly at Ceres. • Dispersed public transport facilities within Ceres CBD. • Poorly located public transport facilities at Ceres and the underutilization thereof.
Langeberg	• Dispersed public transport facilities or ranks at Robertson CBD no integration. • Dispersed rural settlements with vast distances between them. • Poor NMT infrastructure. • Public transport facilities are limited within the rural settlements (McGregor, Montagu).

2.4.2.1Key findings: Integrated District Public Transport Network

2.4.2.1.1 Refer to table 12 (Key spatial challenges per local municipality)

2.4.2.1.2 The CWDM Integrated Public Transport Network Framework (2012) indicated that there is no integration between Spatial Planning/ Land Use Management and Integrated Transport Planning. This leads to the following challenges.

- General lack of transport and land use integration particularly in respect to nodes and corridors.
- Urban nodes are not dense enough to create the thresholds that can sustain affordable and convenient public transport services in the continued low-density urban sprawl pattern of development.
- Owing to the dispersed population distribution in the rural areas, public transport systems are not viable, and taxi-operations are relatively expensive over long distances.
- A large portion of the population still walks significant distances owing to low-income levels and/or poor public transport service provision.
- The unavailability of land for transport and related infrastructure.
- The lack of integrated settlements.

2.4.2.2 Implementation proposals:

RESPONSIBILITY:	FOCUS AREA: INTEGRATED DISTRICT PUBLIC TRANSPORT NETWORK
CWDM, Category B Municipalities & Department of Transport and Public Works	1. Strengthen the transport and other communication networks that link the better located areas with those with less potential; Increase the ability to commute between higher order and lower order towns (refer to settlement classifications) by managing the operating environment, transport system and decision-making mechanisms relevant to transport planning; improve rural transport opportunities. 2. Ensure mobility through affordable, reliable and time-starved transport opportunities, even if it means providing subsidised public transport where marginalised communities require government intervention (mainly rural areas) as a principle-led response; enhance mobility by locating residential areas close(r) to trip destinations. 3. Apply the principles of densification and diversification along (selected) transport routes; Public transport services for special needs passengers; provide and ensure universal access to public transport facilities for persons with physical disabilities. 4. Non-motorized transport and road safety: improve the level of provision for pedestrians and cyclists. 5. Institutional structures: establish institutional structures for the management of public transport at municipal level; increase capacity and resources for public transport planning and management; set up co-coordinating structures between municipalities.
PRIORITY:	HIGH

2.4.2.3 CWDM Implementation Plan: Integrated District Public Transport Network

PROJECT/ACTIVITY:	BUDGET:	RESPONSIBLE DIVISION:	DURATION:	IDP, SERVICE DELIVERY BUSINESS IMPLEMENTATION PLAN (SDBIP) STRATEGIC OBJECTIVE (SO) REFERENCE:
Road Safety Education	R928 000, 00	Public Transport Regulation	Annually	SO 2; 2.2 & 2.3
Sidewalks and Embayment's	R2 100 000, 00	Public Transport Regulation	Annually	SO 2; 2.2 & 2.3
Route Rationalisation-Project Management	R1000 000, 00	Public Transport Regulation	Annually	SO 2; 2.2 & 2.3
ITP Grant-Project Management	R900 000, 00	Public Transport Regulation	Annually	SO 2; 2.2 & 2.3

2.4.3 CULTURAL LAND SCAPE: SENSE OF PLACE

The Cape Winelands is one of the few areas in the country where a specific regional character has established itself over the past three centuries. This regional character is of immense value and must be conserved and recognized as the guiding tenet for planning and development.

To achieve this, it is suggested that the principles pertaining to the protection, enhancement and integration of regional attributes, be recognized in development planning within the district. In this regard, "critical regionalism" which recognizes the quality and attributes of regional characteristics and builds upon the development of regional idiosyncrasies and variations, must be considered with regard to spatial planning and design decisions. The principles of "critical regionalism" specifically 'Sense of Place 'is described as the 'degree to which a place can be clearly perceived and mentally differentiated and structured in time and space by its residents, and the degree to which that mental structure connects with their values and concepts' (Lynch, 1998).

In evaluating a sense of place, one needs to recognise that there are various 'components of sense' that, together, provide a particular environmental quality for the observer. 'Sense of place' is based upon the sensed quality of the unique 'components of sense' of a particular place, including its identity, character, structure, local climate, topography, vegetation, building materials, building practices, and local authenticity.

In practice, in the preparation and consideration of development applications (including architecture and placement of new infrastructure), it is important to ensure that the above 'components of sense' are incorporated into the planning and design. For example, this implies that any development within the natural environment should inter alia reflect elements of the traditional vernacular of the area, make use of local natural building materials, and reflect a strong sense of local authenticity.

Protection of (parts of) the Cape Winelands Cultural Landscape is accomplished through an incremental approach and includes the following areas:

- Idas Valley, Dwars River Valley, Groot Drakenstein/Simondium and Simonsberg State Forest as provisionally protected areas, and
- The "listing" of the Cape Winelands Cultural Landscape as a World Heritage Site (WHS) at UNESCO.

The listing of the WHS does not represent a specific conservation area but merits further investigation to, inter alia, consolidate planning policy, map and layer the WHS and identify and "lift out" cultural landscapes. Cultural landscapes are highly sensitive to impacts that change the character and public memory of a place and include a landscape of high rarity value and scientific significance. Already in 2005, the areas of Stellenbosch, Franschhoek and Paarl were considered as National heritage sites in terms of Section 27 of the National Heritage Resources Act (25 of 1999). Other areas that might be considered as provincial heritage sites include the towns of Tulbagh, Robertson, McGregor and Montagu.

The provisionally protected areas of Idas Valley, Dwars River Valley, Groot Drakenstein/Simondium and Simonsberg State Forest are managed according to a formal Conservation Management Plan that operates under the auspices of a local Heritage Committee. Ten of these committees exist in the Stellenbosch/Drakenstein municipal areas with a dire need to sensitize communities regarding the existence and value of cultural landscapes.

Heritage Western Cape (HWC) is responsible for the management and protection of all provincial heritage sites, generally protected heritage and structures in the Cape Winelands district. Based on discussions with SAHRA, the following steps will advance the recognition and protection of the cultural landscape,

- Photographic/historic surveys (to include a fundamental shift in focus from surveying monuments to rural landscapes)
- To determine sensitivities
- To update existing surveys

- To include the cultural (rural) landscape in existing surveys
- To determine grading of sites
- Compile Conservation Management Plans, and
- Complete Heritage Impact Assessments (only when development applications are submitted to relevant decision-making authorities).

Within the interdependencies of sustainable development, the protection of cultural landscapes should feature in the ability of communities to impact on decision-making, the sharing of the burden and societies' caring and protection of a system of values. The PSDF (2014) proposes the following 'Policy Objectives' to protect, manage and enhance critical regionalism specifically 'sense of place'

- Prevent settlement encroachment into agricultural areas, scenic landscapes and biodiversity priority areas, especially between settlements, and river corridors.
- Promote smart growth ensuring the efficient use of land and infrastructure by containing urban sprawl and prioritising infill, intensification and redevelopment within settlements.
- Respond to and enhance an economically, socially and spatially meaningful settlement hierarchy that considers the role, character and location of settlements in relation to one another while preserving the structural hierarchy of towns, villages, hamlets and farmsteads in relation to historical settlement patterns.
- Use heritage resources, such as the adaptive use of historic buildings, to enhance the character of an area, stimulate urban regeneration, encourage investment and create tourism opportunities, while ensuring that interventions in these heritage contexts are consistent with local building and landscape typologies, scale, massing, form and architectural idiom.
- Conservation strategies, detailed place-specific guidelines and explicit development parameters must supplement urban edges to ensure the effective management of settlement and landscape quality and form.

2.4.3.1 Key findings: Cultural Land Scape, Sense of Place

2.4.3.1.1. Heritage surveys with determined sensitivities that includes rural cultural landscapes, conservation management plans and Heritage Impact Assessments is not prioritised by the relevant role players.

2.4.3.2 Implementation proposals:

RESPONSIBILITY:	FOCUS AREA: CULTURAL LANDSCAPE, SENSE OF PLACE
Category B Municipalities	1. Recognise the principles pertaining to the protection, enhancement and integration of regional attributes in development planning. 2. Consider "*critical regionalism*" which recognizes the quality and attributes of regional characteristics and builds upon the development of regional idiosyncrasies and variations with regard to spatial planning and design decisions. 3. Changes proposed to landscapes and urban settlements whether they be for agricultural or urban and rural development purposes, should consider any heritage resource policy that may be relevant including those which might be proposed, e.g., Proclaimed Urban Conservation Areas, SAHRA Regulations, World Heritage Site applications etc. 4. Foreign or unsympathetic styles of site layout and buildings should be discouraged in urban settlements and rural areas so as to strengthen the local sense of place and minimise visual impact. 5. Urban design and architectural guidelines should be prepared to control the function and appearance of the main street or streets and squares in all of the urban settlements. These should control, among other things, building styles and heights, materials and colours, advertising, roadways and pavements, encourage colonnades and other devices to shelter pedestrians and landscaping and tree planting, and respect historic buildings and precincts. 6. Tree planting, including appropriate indigenous, ornamental and fruit trees, urban greening (landscaping) and food gardens should be encouraged along streets and in open spaces as part of urban restructuring programmes in villages and towns. 7. Conduct a systematic process, starting at the scale reminiscent of the proposed WHS (or Cape Winelands Biosphere Reserve), to identify and grade sites (and routes) and classify landscapes to protect the cultural landscape; use these findings for the compilation of an inventory of the heritage resources by the planning authority and submission of such inventory to the relevant provincial heritage resources authority. 8. Conduct the necessary steps to give effect to the registration of the WHS. 9. Responsible heritage resource authorities and local authorities to establish partnerships between themselves and with nongovernmental organisations, business, farmer unions, etc to effectively manage national heritage resources.

	10. Compile a visual resource management plan for the N1 route between the Hugenote Tunnel and Cape Town.
	11. Include design and architectural guidelines (including reference to choice of building material) as a key component of localised planning (and SDFs of B Municipalities
	12. Ensure sufficient resources (personnel and funds) within SAHRA and HWC to perform legislative mandates
PRIORITY:	MEDIUM

2.4.4 WATER INFRASTRUCTURE

In the CWDM area, 86.9% of households have access to flushing toilets and 97.7% of households have access to piped water. One of the most critical issues impacting on the economic-development process in the district is the water supply in the region and in each of the different towns and settlements, taking into account concerns about long-term water supply trends and climate-change processes.

For the Langeberg and Witzenberg municipalities, small local supply schemes meet almost all the urban water requirements. Augmentation of current urban supply schemes may be required in the future, depending on growth in requirements. However, all local authorities must first undertake and implement more efficient water use and water re-use from their existing resources before consideration will be given to the development of new schemes. Invasive alien vegetation management remains as crucial as water infrastructure maintenance. Municipalities were tasked by National/Provincial government to development Invasive Alien Vegetation Management Plans. It is the intention of these plans to identify government/municipal land that needs to be cleared of invasive vegetation.

Table 14: Dams for domestic supply in the CWDM area.

Local Municipalities	Capacity (million m3)	Domestic use	Other use
WITZENBERG			
Koekedouw	22.5	Ceres, Prince Alfred Hamlet	Irrigation
Lakenvlei	10.3	Roode Elsberg Dam for De Doorns.	Irrigation/Domestic As per Roode Elsberg
Tulbach Town Dam		Tulbagh	
LANGEBERG			
Poortjieskloof	9.2		irrigation
Klipberg	2.0		Irrigation
Pietersfontein	2.0		Irrigation
Moordkuil/Draaivlei	1.07		Irrigation
Grootvlei	1.6		Irrigation
BREEDE VALLEY			
Keerom,	10.4		Irrigation
Stettynskloof	15.5	Worcester, Rawsonville	Irrigation
Greater Brandvlei	319.3	Robertson, Ashton,	

		Montagu, Bonnievale	
Elands Kloof	11.4	Touwsriver	Irrigation
Fairy Glen	0.5		Irrigation
Buffelsjag	5.2		
Roode Elsberg	7.7	De Doorns	Irrigation
DRAKENSTEIN			
Wemmershoek	58.8	CoCT, Paarl	
Voelvlei	164.1	CoCT, Cape West Coast	
Paarl Mountain		Paarl	
STELLENBOSCH			
Idas Valley 1	0.50	Stellenbosch	
Idas Valley 2	1.54	Stellenbosch	
Bergriver	130	CoCT, Franschhoek, Stellenbosch	

2.4.4.1 Potential risks associated with water infrastructure:

Dam failures and disruptions to basic services i.e., water supply is highlighted in the CWDM Risk Assessment (2014) as potential risks.

Dam failures; There were two dam failures reported since 2008, in Vlottenburg during 2012 (Stellenbosch Municipal area) and Tulbagh in 2016 (Witzenberg Municipal area). To date there was an extreme increase in rainfall with major floods causing damage of approximately R 1.6 billion.

Areas, communities or households most at risk;

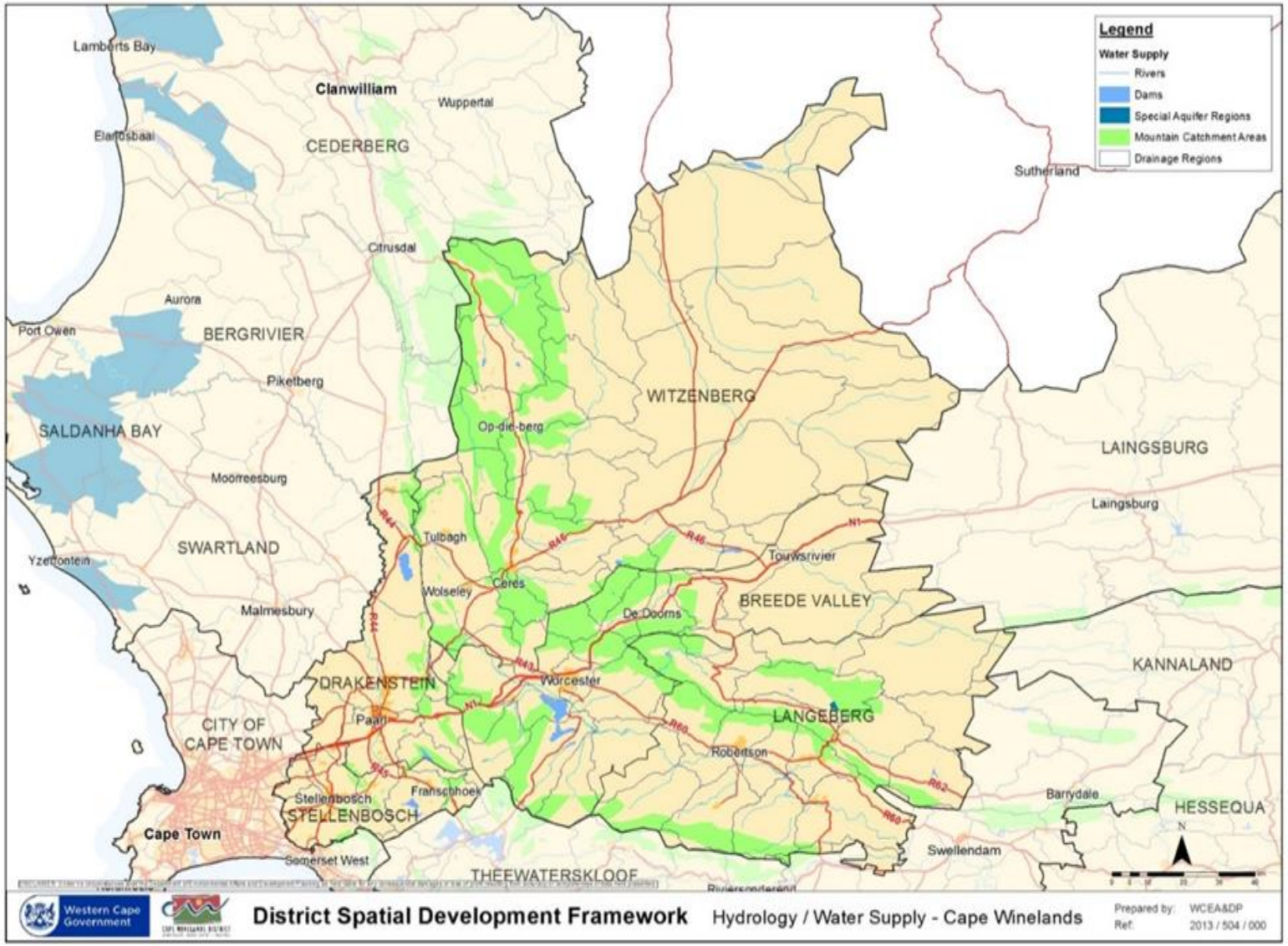
- Communities, towns and property owners living downstream of a dam.
- Farming communities, under the category of agriculture, are the second biggest sector of water users after the City of Cape Town. Their dependency on water increases their vulnerability, should a dam break occur.
- Roads and other critical infrastructure situated close to the dam e.g., water purification systems and sewage treatment plants.

Disruption of Basic Services: Water Supply; Water supply disruptions occur during maintenance or repair work. The CWDM area has many indigent households, the latter might have an impact on municipal maintenance budgets. It may be necessary for municipalities to develop significant indigent policies that does not add to the poverty trap. Likely impacts of disruptions could result in:

- Health and sanitation problems if prolonged interruptions occur
- Economic impact to businesses and industries due to a lack of production
- Discomfort to households

Conditions that increase the severity of water supply disruptions are:

- As a result of decreased rainfall (climate change), all resources, especially surface water resources, will be under pressure and will have lower safe yields
- Due to increased heat units, water demand from agriculture, as well as from towns will rise sharply even in the event that average rainfall would not
- reduce much, it is anticipated that much greater variability of rainfall will occur within a year and also between years due to more extreme climatic conditions.
- From a water service perspective, the most significant challenges are the augmentation of existing water sources, the replacement and upgrading of old infrastructure to accommodate development, the provision of sustainable basic services to informal settlements and to ensure the provision of basic services to rural communities located on private farms
- The elevated concentrations of dissolved salts from the naturally saline soils and groundwater are aggravated by intensive agricultural land use
- Effluents can be washed into rivers during high rainfall events increasing the organic loads to the receiving rivers influencing water quality.



Map 10: Hydrology and water supply.

2.4.4.2 Key findings: Water Infrastructure

2.4.4.2.1. Refer to disruption of basic services- water, specifically conditions that increases the severity of water supply disruption.

2.4.4.2.2. Catchments of the bulk of dams within the CWDM is infested with invasive alien plant species. The invasive plant species pose a major threat to water conservation.

2.4.4.2.3. Municipalities must complete their Invasive Alien Vegetation Management Plans. Implementing these plans through active alien clearing is as important as water infrastructure maintenance.

2.4.4.2.4. Increased risk of drought due to climate change will add extra pressure on water infrastructure. Municipalities should seek and employ alternative methods to augment water supply as well reduce the demand.

2.4.4.3 Implementation proposals:

RESPONSIBILITY:	FOCUS AREA: WATER INFRASTRUCTURE
Category B Municipalities	1. Municipalities must complete their Alien Vegetation Management Plans for municipal properties; Increase alien clearing in catchments located throughout the entire District and B municipalities in partnership with CWDM, Department of Water and Sanitation and LandCare Programme. 2. Ensure that the municipal infrastructure to provide basic services to communities is in place, effective and maintained; for this to be achieved within a common understanding in enough detail of the long-term objectives and direction of our society and a common vision. 3. Determine the impact of long-term water supply trends and climate-change processes on growth and development. 4. Invest in technologies and systems that decouple economic growth from rising raw water consumption 5. Where urban development proposals will exceed infrastructure capacity, applications should be refused until provision is made to deal with the additional loads 6. Local authorities to undertake and implement more efficient water use and water re-use from existing resources; management of infrastructure and optimizing operation of the works will ensure minimum water losses at all water works and pipelines; training of process controllers to increase awareness of the importance of operating and maintenance in the works. 7. Water augmentation possibilities that can be investigated and implemented by municipalities include Aquifer recharge, subsidising grey water systems and rain tanks, making greywater systems compulsory for new developments, treating and

	storing storm water, treating sewerage for water use, small catchment management levies, rehabilitation of wetlands and riparian areas, alien clearing, gamifying water targets to increase participation/adherence by communities.
PRIORITY:	HIGH
INDICATORS	1. Have municipal alien clearing plans been completed and approved? How many hectares has been cleared per annum? The hectares cleared includes initial and follow-up clearing of invasive alien plant species. 2. Are the water users' associations and catchment management agencies busy clearing alien invested areas in the riparian zone on the Berg and Breede Rivers? 3. How many high-altitude alien clearing projects are being implemented in the CWDM catchments? Where are they located?

2.4.4.4 CWDM Implementation Plan: Water Infrastructure

PROJECT/ACTIVITY:	BUDGET:	RESPONSIBLE DIVISION:	DURATION:	IDP, SERVICE DELIVERY BUSINESS IMPLEMENTATION PLAN (SDBIP) STRATEGIC OBJECTIVE (SO) REFERENCE:
EPWP Invasive Alien Vegetation Management	R 2 030 000, 00	Spatial Planning and Environmental Management	Annually	SO 1; 1.4
River Rehabilitation	R 100 000, 00	Spatial Planning and Environmental Management	Annually	SO 1; 1.4
Subsidy: Water/Sanitation Rural areas/Farms	R1000 000, 00	Municipal Health Services	Annually	SO 2; 2.2
Provision of Water to Schools	R400 000, 00 year 1; R500 000, 00 outer years	Projects and Housing	Annually	SO 2; 2.2

2.4.5 SOLID WASTE DISPOSAL

According to the White Paper: Policy on Pollution, Waste Minimisation, Impact Management and Remediation (2000), municipalities are responsible for providing waste management services, and managing waste disposal facilities. Specific functions to be carried out by municipalities include;

- Compiling and implementing general waste management plans, with assistance from provincial government

- Implementation of public awareness campaigns
- Collecting data for the waste information system
- Providing general waste collection services and managing waste disposal facilities within their areas of jurisdiction
- Implementing and enforcing appropriate waste minimisation and recycling initiatives, such as promoting the development of voluntary partnerships with industry, including the introduction of waste minimisation and recycling initiatives, such as promoting the development of voluntary partnerships with waste minimisation clubs.

The CWDM's function is limited to the development of a District Integrated Waste Management Plan and the regionalisation of landfill, both investigation and possible management of a regional facility which will pose operational and financial challenges. The CWDM initiated the investigation of two regional landfill sites, a site for the eastern and western portion of the district. The investigation into a regional landfill site for the eastern portion of the CWDM was successful. The proposed site will service Langeberg, Witzenberg and Drakenstein municipalities. However, the outcome of the investigation for the western portion of the district which consist of Stellenbosch and Drakenstein municipalities indicated that there is no suitable space for a regional landfill site.

Currently a licence was issued for the regional landfill site in the eastern portion of the district. An appeal was lodged against the issuing of the mentioned licence due to the minister rejecting objections on the application for the licencing of the mentioned regional landfill site. Whilst the regional landfill site has not been constructed the local municipalities are managing waste disposal sites in their relevant municipal areas. These local waste disposal sites are going to be closed upon the construction and opening of the regional land fill site in the eastern portion of the CWDM. Waste disposal issues relating to a lack of a regional landfill site for the western portion of the district (Stellenbosch & Drakenstein municipalities) could be solved by Drakenstein municipality's Waste to Energy programme. The CWDM will encourage possible negotiations between the two local municipalities.

2.4.5.1 Status Quo: Local Municipal Waste Management (CWDM IWMP, 2015)

Waste management in local municipalities resides under three municipal functions, i.e., waste collection, waste disposal and waste reduction.

Waste Collection: Where collection of domestic municipal waste is concerned, the majority of urban residents within the CWDM area are receiving a municipal collection service.

Breede Valley Municipality; there is currently no collection service to farmers and rural households' due to the problem of transport distances and accessibility. Farmers offload their waste at the disposal sites free of charge. The unserviced areas in the municipality are the rural areas and farms. Received figures indicates that 7190 out of the 7315 indigent households receive free basic refuse removal, which is 98%.

Drakenstein Municipality; in the rural areas and farms there are three scenarios: If the farm is on a collection route, the farm waste is placed by the owner outside his property boundary from where it is collected by the Municipality. Farmers also transport and offload their waste themselves to the Paarl Transfer Station or the Wellington Landfill and they make use of the coupon system. Farmers can also apply for the use and service of a waste skip that is placed on his property. He pays a monthly fee, and the Municipality collects the filled skip when they are notified. Received figures indicate that 12 429 out of the 12 429 indigent households receive free basic refuse removal, which is 100%.

Langeberg Municipality; the farming community delivers their own waste to landfill, as it is not economically feasible for the Municipality to collect waste at these remote locations. Received figures indicate that 6 932 out of the 7 413 indigent households receive free basic refuse removal, which is 94%.

Stellenbosch Municipality figures indicate that 4 217 out of the 4 217 indigent households receive free basic refuse removal, which is 100%.

Witzenberg Municipality; the municipality does not collect waste at the remote farming communities, as this would be economically unsustainable. Farming communities deliver their own waste. Received figures indicate that 4 572 out of the 4 572 indigent households receive free basic refuse removal, which is 100%.

Waste Reduction: recovery for recycling is done by Material Recovery Facilities (MRFs) in the following towns/settlements;

- Breede Valley Municipality- Touws River Transfer Station and MRF.
- Drakenstein Municipality-Paarl MRF and Wellington Landfill Site.
- Langeberg Municipality-Robertson Composting Facility and Ashton, Montagu and Bonnievle MRFs.
- Stellenbosch Municipality- Source separated waste is collected in Stellenbosch with recycling taking place at the Kraaifontein Waste Facility in the City of Cape Town Metro.
- Witzenberg Municipality-Tulbagh Landfill and Ceres, waste is separated outside Ceres and transported to Cape Town.

Waste Disposal: Operating landfills are located at the following locations (refer to map 13;

- Breede Valley Municipality; Worcester, De Doorns and Touws River.
- Drakentein Municipality; Wellington.
- Langeberg Municipality; Ashton, Bonnievale and Montagu.
- Stellenbosch Municipality; Stellenbosch.

- Witzenberg Municipality; Wolseley, Tulbagh, Prince Alfred Hamlet, Op -Die-Berg.

Table 15: Required total capital costs to develop Regional Landfill Site (Feasibility Study 2021, Section 78 (3) of MSA, 1998)

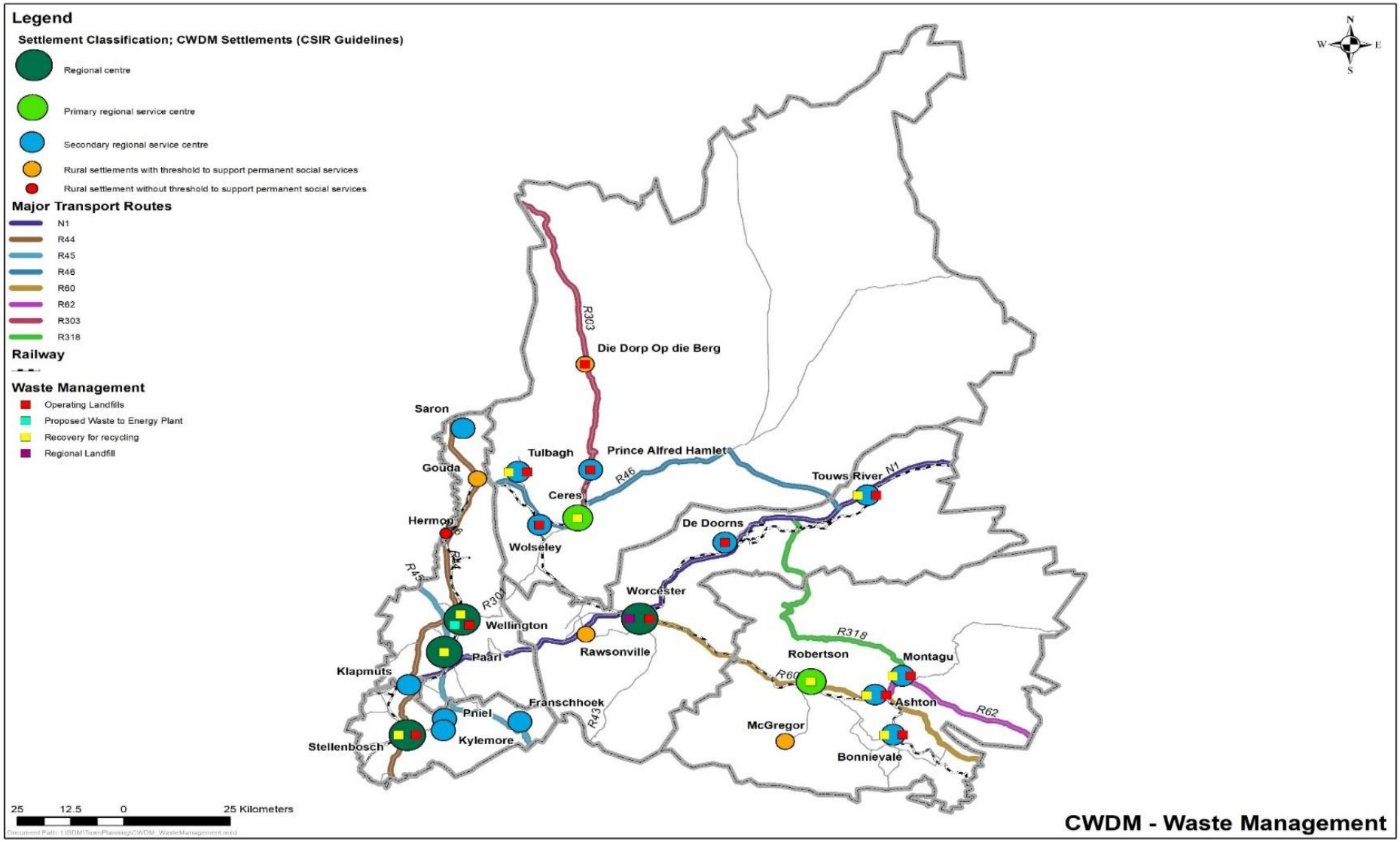
Capital Cost Requirement	Breede Valley Mun.	Langeberg Mun.	Witzenberg Mun.
Regional Landfill	R48, 681, 567	R24, 374, 719	R22, 745, 420
Municipal Infrastructure	R14, 880, 000	R13, 190, 000	R46, 990, 000
Municipal Collection fleet	R25, 200, 000	R19, 800, 000	R18, 900, 000
Total:	**R88, 761, 567**	**R57, 364, 719**	**R88, 125, 420**

Table 16: Estimated Annual Operational Costs per Municipality (Feasibility Study 2021, Section 78 (3) of MSA, 1998)

Breede Valley	Mun.	Langeberg	Mun.	Witzenberg	Mun.
Collection	R8,993,061	Collection	R5,708,672	Collection	R7,038,256
Transfer/Drop-offs	R1,268,430	Transfer/Drop-offs	R4,248,228	Transfer/Drop-offs	R3,365,053
Landfill	R4,274,166	Landfill	R2,140,063	Landfill	R1,997,013
Rehabilitation	R1,728,918	Rehabilitation	R865,664	Rehabilitation	R807,800
Total Breede Valley:	**R16,264,576**	**Total Langeberg:**	**R12,962,627**	**Total Witzenberg:**	**R13,208,122**

Table 17: Capital Cost Requirement for Closure & Rehabilitation of Existing Waste Disposal Sites (Feasibility Study 2021, Section 78 (3) of MSA, 1998).

Breede Valley	Mun.	Langeberg	Mun.	Witzenberg	Mun.
De Doorns	R13,679, 410	McGregor	R15,611,336	Ceres	R3,208,883
Worcester	R60, 202, 726	Montagu	R8,086,125	Prince Alfred Hamlet	R38,353,176
		Bonnievale	R12,616,566	Wolseley	R20,532,911
		Ashton	R19,313,681	Op-die-Berg	R4,768,317
					R14,421,769
Total Breede Valley:	**R73,882,136**	**Total Langeberg:**	**R55,627,708**	**Total Witzenberg:**	**R81,285,056**



Map 11: Waste Management; Operating Landfills, Recovery and Recycling facilities and proposed Regional Landfill Site.

2.4.5.2 Key findings: Solid Waste Disposal

2.4.5.2.1The strategic objectives of the CWDM relating to Waste Management places an emphasis on waste avoidance, waste reduction and waste disposal. Waste avoidance refers to avoiding materials of entering the waste stream e.g., by re-use, composting etc. Waste reduction refer to reducing the quantity of waste e.g. by doing recycling and waste disposal is defined as the storage, treatment or disposal of waste at licensed facilities. The CWDM IWMP highlights the fact that over the year's municipalities placed a greater emphasis on waste collection and disposal. The more sustainable approach of waste minimisation and reduction has been adopted recently. Municipalities will however have to shift to avoidance and reduction of waste rather than the disposal thereof.

2.4.5.2.2 Public awareness and education remain an issue, in order to move towards waste avoidance and greater reduction, public awareness and education must be prioritised.

2.4.5.2.3 A feasibility study compiled during 2021 determined costs for a) required total capital costs to develop Regional Landfill Site, b) estimated annual operational costs per municipality and c) capital cost requirement for closure & rehabilitation of existing disposal sites. Refer to tables, 15, 16 and 17.

2.4.5.2.4 The absence of a regional land fill site for the western portion of the CWDM will have implications for waste disposal in the Stellenbosch municipal area since local waste disposal sites are close to reaching their life span. Drakenstein municipality's Waste to Energy programme might present opportunities for Stellenbosch municipality to dispose their waste.

2.4.5.2.5 Municipalities must develop indigent policies. As indicated, indigent household figures for the entire district are 48 621 (MERO, 2020.)

2.4.5.3 Implementation proposals:

RESPONSIBILITY	FOCUS AREA: SOLID WASTE DISPOSAL
Category B Municipalities in partnership with the CWDM & PGWC	1. Develop waste reduction strategies.
	2. Prioritize public awareness in terms of waste reduction and avoidance.
	3. Develop a Regional Landfill site for the Western and Eastern portion of the CWDM area. If a Regional Landfill site for the Western Portion of the CWDM is not practical, then the stalled Drakenstein Municipal Waste to Energy Program must be continued. The mentioned program must absorb the waste generated on the Western portion of the CWDM.
	4. Investigate alternative technologies that can assist with the disposal of waste.

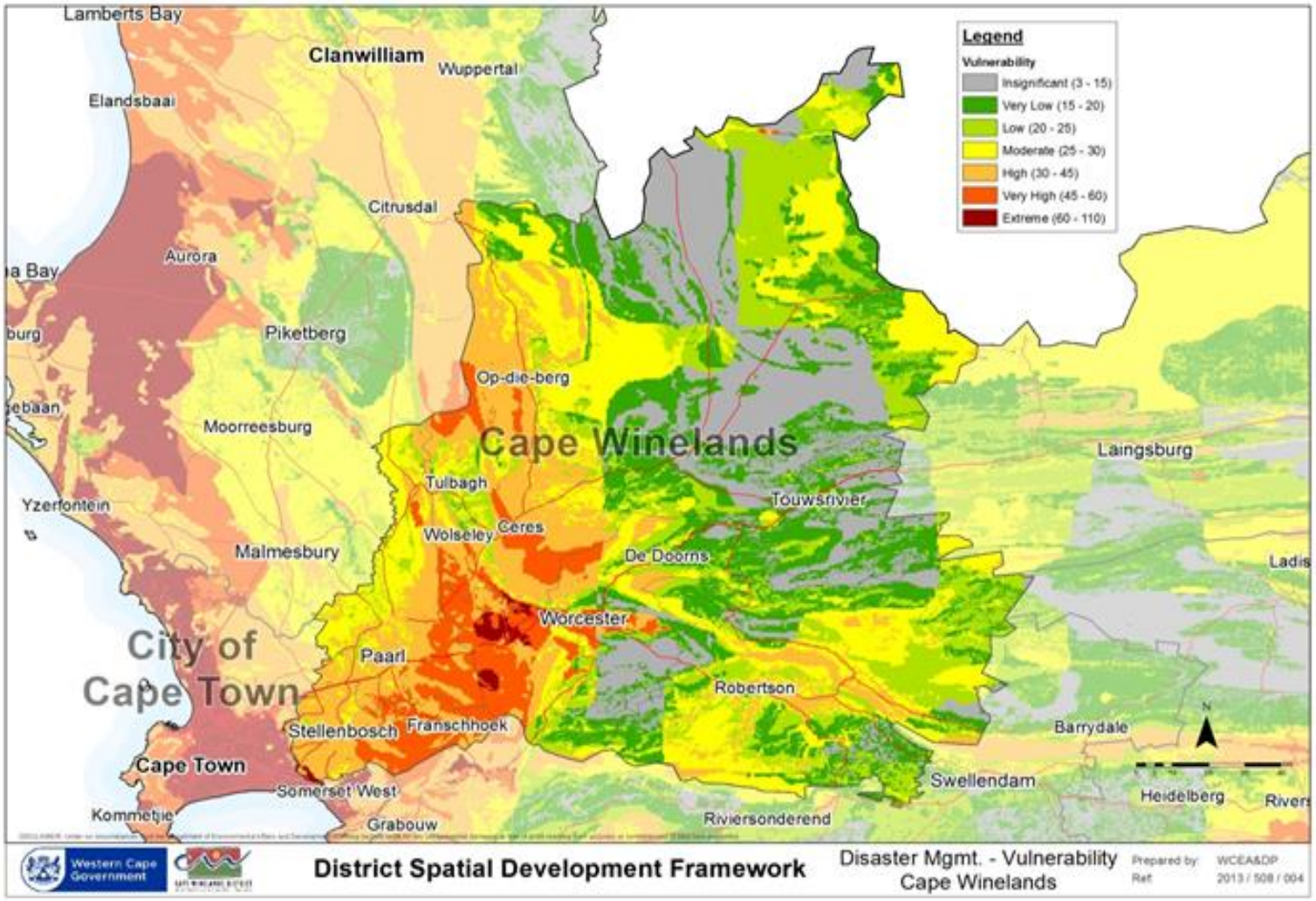
PRIORITY:	HIGH
INDICATORS	1. Has waste reduction strategies been developed and implemented? 2. Has a regional landfill site been developed in the eastern portion of the CWDM? 3. Has a regional landfill site been developed for the western portion of the CWDM? 4. Has alternative technologies been a) investigated and b) applied in the CWDM, including the operational responsibilities of the category B municipalities.

2.4.5.4 CWDM Implementation Plan: Solid Waste Disposal

PROJECT/ACTIVITY:	BUDGET:	RESPONSIBLE:	DURATION:	IDP, SERVICE DELIVERY BUSINESS IMPLEMENTATION PLAN (SDBIP) STRATEGIC OBJECTIVE (SO) REFERENCE:
Organic Waste Diversion Plans for Category B Municipalities	R2 000 000, 00	Technical Services	Annually	SO 2; 2.2
Regional Landfill Site	R27 000 000, 00 year 1; R64 000 000, 00 year 2; R16 000 000, 00 year 3	Technical Services	Annually	SO 2; 2.2
Regional Landfill Site Planning	R1000 000, 00	Technical Services	Annually	SO 2; 2.2

2.4.6 DISASTER MANAGEMENT: GEOGRAPHIC RISK AREAS

Map 12 below reflects overall disaster vulnerability that includes fire, flooding and landslides (PSDF, 2014)



2.4.6.1 Potential risks associated with vulnerability spatial depiction (refer to map 12)

Flooding:

Flooding occurs at least once a year within the CWDM area. The largest and most important rivers in the area are the;

- Breede River
- Olifants River (of which only the headwaters lie within the study area)
- Doring River (the only large river that is still in a natural condition)
- Touws River (which is significantly modified)

Table 18: Likely impacts of flooding

Economic:	Environmental:	Social:
• Extensive damage to both property and infrastructure • Large damage costs • Disruption in influx of tourists • Overflowing of dams and potential dam failure • Road closures • Disruption of services i.e. electricity, water, public transport and emergency services such as ambulances, hospitals etc. • Significant economic losses for businesses and farms	• Rivers spilling their banks resulting in flash floods • High run-off, severe erosion that leads to instability of steep catchments • Displacement of large amounts of sediment downstream • Slope failure, rock falls and mudslides on steep slopes or mountainous areas	• Low-cost housing most affected • Injury and loss of lives to people and animals • Displacement of households and communities • Increase in the number of people with water borne diseases

Conditions that increase the severity of flooding;

- Irregular maintenance of storm water systems. For instance, litter, rubble and other dumped objects blocking storm water drains and streams, worsening the impact of the floods

- Debris-loading from soil erosion due to exposure of large tracts of land, along with vegetative debris loading associated with vegetation clearance can be washed into watercourses and swept downstream, where they obstruct culverts, channels and bridges.
- Increase and encroachment of low-cost housing or informal settlements in areas prone to flooding placing large numbers of people at risk.
- Rapid urban growth in floodplains that has hardened river catchments, increasing surface run-off.
- Under-investment in municipal maintenance and roads and protective stormwater systems.
- The risk of damage also increases when natural flood-paths of rivers are altered, and wetlands degraded in severe weather-exposed areas.
- Lack of household insurance.

Veld Fires:

The Western Cape ‘s fire season is generally from November to April, when temperatures are highest. During these months, there is greater use of natural recreational areas and the indigenous fynbos is also more likely to burn. Fires should generally not occur more than once every seven years, to avoid a loss of species that have not matured and produced seeds. The Western Cape ‘s fire season officially ends at the end of April.

Areas, communities or households most at risk;

- The whole district is fire prone with less frequent fires occurring towards the north of Ceres.
- Mostly in urban rural edge - informal settlements located at the urban edge where these fires usually start, which spreads to the veld and forests.
- Houses located at the urban edge with limited access.
- Mountainous areas are at high risk in the CWDM area.
- Areas with a high presence of alien plants.
- Commercial or small farms in isolation. Recreational areas i.e., picnic and hiking trails where many fires tend to start.
- Three major fires occurred in the Franschhoek area since 1999, i.e., February 1999, December 2005 (6-year gap) and January 2013 (7-year gap).

Table 19: Likely impact of veld fires

Economic:	Environmental:	Social:
• Damage and loss of property and infrastructure • Loss of farming lands, forestry and plantations • Claims against municipalities	Positive impacts: • Control of invasive alien plants • Promotion of desirable plants Negative impacts: • Loss of biodiversity (if fynbos burns too frequently or direct animal mortality • Loss of vegetation cover and increased erosion • Increased alien infestation (in disturbed areas where alien plants are often pioneer species) • Habitat fragmentation • Loss of ecosystem services, i.e., water production.	• Evacuation of people from homes • Reduction in potable water • Injury and loss of lives • Loss of employment / reduction in hours worked which affect livelihoods • Loss of personal items and special memorabilia.

2.4.6.2 Key findings: Disaster Management, Geographic Risk Areas

2.4.6.2.1 Refer to conditions that increase the severity of flooding.
2.4.6.2.2 Veld fires are exacerbated by warm, dry and windy conditions. The recent El Nino worsened the severity of veld fires in the Western Cape province.

2.4.6.3 Implementation proposals

RESPONSIBILITY:	FOCUS AREA: DISASTER MANAGEMENT, GEOGRAPHIC RISK AREAS
Category B Municipalities	1. Plan and provide access roads for fire trucks in informal settlements; provide suitable roads as evacuation routes in informal settlements; provide informal areas with fire-resistant materials; provide fire hydrants in informal settlements

in partnership with CWDM and PGWC	2. Plan fire services in line with new development needs 3. Ensure that development of residential dwellings only takes place after adequate bulk services are provided 4. Provide additional fire hydrants in all areas 5. Install watch towers, fire breaks, fire extinguishers in forestry areas 6. Ensure that fire hydrant water supply is sufficient in higher lying areas 7. Ensure the enforcement of an Environmental Impact Assessment (EIA) with all development projects (according to the NEMA guidelines) 8. Plan for the upgrading of existing infrastructure to cope with new developments 9. Identification and plotting of vacant high-risk flood areas for future reference and avoid human settlements in such areas 10. Avoid development and settling of communities along rivers and within the flood line 11. Study and understand the impact of climate change on development 12. Ensure proper and appropriate signage regarding flood risk especially in low-lying areas 13. Plan and build retention dams to reduce risk of flooding 14. Improve and upgrade stormwater reticulation systems regularly 15. Identify earthquake prone areas / geological faults 16. Design strong earthquake resistant infrastructure services 17. Monitoring, restricting and managing of routes for hazardous materials (hazmat) in transit (railways/roads) 18. Provide specific parking areas along the roadside for vehicles transporting hazardous material 19. Increase hazmat capabilities on main routes where hazmat freight vehicle parking areas are to be found Identification of containment sites and measures
PRIORITY:	HIGH

2.4.6.4 CWDM Implementation Plan: Disaster Management, Geographic Risk Areas

PROJECT/ACTIVITY:	BUDGET:	RESPONSIBLE:	DURATION:	IDP, SERVICE DELIVERY BUSINESS IMPLEMENTATION PLAN (SDBIP) STRATEGIC OBJECTIVE (SO) REFERENCE:
Annual Environmental Health Education Programme	R521,537 year 1; R411, 537 outer years	Municipal Health Services	Annually	SO 1; 1.1
Food-Water Samples and Testing	Operational Budget	Municipal Health Services	Annually	SO 1; 1.1
Disaster Management	Operational Budget	Disaster Management Section	Annually	SO 1; 1.2
Fire Services	Operational Budget	Fire Services Section	Annually	SO 1; 1.3

3. DISTRICT SPACE ECONOMY

3.1 ECONOMIC GROWTH SECTORS

A cause for concern is that after 2014, the economy of the Cape Winelands District grew at a slower rate each year, with 2018 and 2019 experiencing the lowest growth rates since the recession in 2009. The downward growth trend continuous (MERO 2020). Reasons put forward by the MERO (2017) are due to national and international developments affecting the economy. This can be broken down to;

- General increases in food prices due to the drought of 2015-2017
- Rising national unemployment and increasing interest rates having a negative impact on investment while volatility in the Rand against currencies such as the US Dollar, Pound Sterling and Euro are contributing to rising inflation as South Africa is generally a net importer of goods.
- Other factors are, declining business confidence, political instability and the sub investment credit rating by agencies are all contributing to the deteriorating economic conditions.

The impact of the Covid 19 pandemic has not yet been quantified and reflected in the MERO (2020), it is however expected to exacerbate the existing economic growth trend

Table 20: GDPR growth trend between 2010 and 2018, and GDPR contribution and growth (MERO 2017, 2020)

Municipality	2010-2015	2014-2018	Contribution to GDPR (%) 2018	Real GDPR Growth (%) 2018	Real GDPR Growth (%) 2019e
Witzenberg	4.4	3.1	13.8	0.4	0.4
Drakenstein	2.5	1.4	32.6	0.5	0.0
Stellenbosch	2.6	1.4	24.0	0.6	0.1
Breede Valley	3.0	1.7	19.2	0.5	0.0
Langeberg	3.2	1.9	10.4	0.7	-0.3
Total CWDM:	**2.9**	**1.7**	**100**	**0.7**	**1.1**
WC Province:	**2.6**	**1.4**		**0.8**	**0.3**

The following sectors are regarded as key in driving growth, job creation and poverty reduction in the Cape Winelands:

Agriculture: significant for its forward linkages within the economy; direct contribution to turnover and employment; robustness and resilience; and potential for new activities and markets. As noted, agriculture remains the backbone of the provincial economy despite the importance of secondary and tertiary economic activities. This is especially the case in the Cape Winelands District which is home to a third of the province's agricultural sector employing 21% of the district's workforce (MERO, 2020). In the Cape Winelands, around 90 per cent of goods exports are from the agri-processing value chain (PERO 2016: 47). This sector, together with tourism, and oil and gas, were selected as strategic priority areas for provincial focus due to their conduciveness to inclusive growth.

Wholesale and retail trade, catering and accommodation: key sector owing to established foreign markets and networks; potential for expansion in the domestic market; generation of foreign currency; backward linkages to agricultural sector; lateral linkages to services sector; and the existing built and natural capital within the region.

Financial/ Real Estate/ Insurance and Business Services Sector: leading growth sector currently; potential to attract the 'Call Centre' and Business Processes Outsourcing industry into the region, in particular the Dutch industry; and the region's ability to attract Johannesburg and Cape Town based firms' headquarters the Cape Winelands is definitely the 'place to be'.

Manufacturing: established sector with strong backward linkages to agriculture; potential for SMME development; and an important job generator.

3.1.1 Other sectoral opportunities:

The Green Economy

It is essential that in applying the spatial logic (Capitalise, Consolidate, Connect and Cluster), the transitioning to a green economy is prioritised. A green economy is defined as an economy that aims at reducing environmental risks and ecological scarcities that aims for sustainable development without degrading the environment.

The Western Cape Government has realised the potential of benefits of a green economy and started an initiative called "Green is Smart" (Western Cape Government, 2013a). This is a green economy strategy framework and aims to optimise green economic opportunities and enhancing environmental performance in the Western Cape. The framework aims for the Western Cape to become the lowest carbon intensive province and a leading green economic hub of the African continent, through the following five drivers: "smart living and working", "smart mobility", "smart eco-systems", "smart agri-production", and "smart enterprise" (Western Cape Government, 2013a) (Van Niekerk, Brent and Musango 2013).

The green economy prospects will carve a pathway in the Cape Winelands District since the agricultural industry continues to play a big part in the economy of the district and province. The region's agricultural contribution (8.8 per cent, MERO, 2020) is the largest in the Western Cape Province accounting for more than a third of the province's agricultural real value add. The agriculture and agro-processing industries are also responsible for the bulk of the region's exports (Cape Winelands Regional Development Profile 2013:50).

Further, the PERO 2014 identifies agriculture and tourism as sectors in which the Western Cape has comparative advantage. Both sectors have been highlighted in the Green is Smart strategy as priorities for support and intervention. The vibrant agricultural and tourism sectors of the province make it

particularly sensitive to environmental risks. Over and above biophysical risk, agriculture is also exposed to indirect regulatory and market-related risk through carbon taxes, increasing energy prices and related changing preferences in the main export markets.

The Knowledge Economy

Given the many challenges currently facing developed and developing countries, the demands made on skills training, applied as well as fundamental research and the utilisation of research are huge. This also applies to South Africa which faces the challenges of both, developed and developing societies. The Western Cape is currently still relatively better placed (in terms of most knowledge-generation indicators) to tackle these challenges. This is relevant for Stellenbosch and the Stellenbosch-Paarl axis, but also for some of the other places in the district.

The knowledge economy must be viewed as both an input into and an output of economic growth. The type of sectors and niches which characterize the Cape Winelands economy demand fairly sophisticated skills and technology inputs (even the agricultural niches!). On the other hand, many new or growing enterprises are directly engaged in the research, development and training fields (e.g., alternative energy, organic food and environmental care). Thus, "knowledge generation" can be viewed as a growth sector in the Cape Winelands economy.

Fourth Industrial Revolution

The Fourth Industrial Revolution (4IR) builds on the Third Industrial Revolution, or digital revolution. It is characterised by the increased complexity, development and use of artificial intelligence, robotics, blockchain, nanotechnology, quantum computing, biotechnology, The Internet of Things, 3D printing and autonomous vehicles. The resulting effects cause and increased integration or 'blurring of lines' between the technology, biology and physical spheres. This revolution is having and will have serious effects on many areas of the economy, leading potentially to increased efficiency, sustainability and the creation or requirement of new types of skills, jobs or careers. However, this will likely lead to the loss of jobs in some areas, especially the unskilled labour areas.

The Fourth Industrial Revolution has already been identified as a serious impactor on the future agricultural sector of the Western Cape. Water saving technology, drones, robotics, farm-management software, precision agriculture, predictive analytics and genetic developments can have positive effects on the sustainability of the sector and food security into the future.

3.2 MUNICIPAL SPACE ECONOMY

3.2.1 Drakenstein and Stellenbosch Municipal area:

The largest contributing municipal areas to the CWD economy were Drakenstein (R22.0 billion) and Stellenbosch (R16.2 billion) municipal areas, contributing 32.6% and 24.0% respectively to the district's total GDPR in 2018.

Over the past decade(s), Stellenbosch and Paarl/Wellington has seen growth in each of the following sectors: *higher education and research* (Paarl/Wellington to a lesser extent), *agriculture and agri-processing*, *tourism, corporate headquarters and business services*, *retirement settlements*, and other sectors that include a *resilient retail sector* and *diverse (small and medium-sized) industrial enterprises*. These could be related to agriculture, forestry, furniture making, publishing or the craft sector.

Paarl/Wellington has higher education facilities which gives this area a strong base in education, though in no ways comparable to Stellenbosch with its university-dominance. The research and innovation at Stellenbosch Technopark and its close relationship with the Stellenbosch University has made Stellenbosch the most important contributor to the science and technology sector in the district. Similar to Stellenbosch, Paarl also has corporate headquarters and, due to its slightly stronger manufacturing base, seems well placed to attract others. Being the largest town in the Drakenstein municipal area, Paarl/ Wellington have attracted all the major retail chains, making retailing a further growth sector. The nearby N1 has been a strong drawcard for retail expansion. To some extent, this as well as the broad sector base has also stimulated financial, property and business services.

Both Stellenbosch and Drakenstein Municipalities have identified Klapmuts as a prospective sub-regional urban node along the N1. Residential and industrial development opportunities have been identified north and south of the N1, and the area has also been identified as having potential to serve as a regional freight logistics hub.

3.2.2 Breede Valley Municipal area:

The area covered by Breede Valley Municipality consists basically of the N1-transport corridor between the entrance to the Karoo and Du Toitskloof Pass, together with the Wemmershoek mountain in the southwest of the area. Worcester fulfils a multiple role in this area with the smaller places along the N1 corridor either directly linked to the transport sector or agricultural activities in the more immediate vicinity. Thus, Touws River derived its significance from the

station and its role as transfer from steam to electricity – a role that has been lost and which caused the shrinking of the town's economic base. De Doorns has been linked to agriculture, with special focus on export grapes, where increased global competition has caused local stagnation. Rawsonville is agri-processing based, with additional activities due to its location at the inland edge of Du Toitskloof Pass. Smaller places to the north of the N1 are mostly linked to tourism (like Goudini) and dispersed agricultural activities.

Worcester is the commercial, industrial, services and administrative hub of Breede Valley municipality, for development purposes the town has spare capacity i.e. vacant developable land-industrial and residential. Through the N1 corridor and railway connections the town has optimal access to the markets of the Cape Town metropolitan area. On a macro (district) scale it is believed that Worcester should be subject to an investment focus as a 'major service centre' due to being the largest town in the Northern Boland region with the broadest economic base. Worcester is also easily accessible from surrounding towns/towns located in the Langeberg & Witzenberg municipal areas.

3.2.3 Witzenberg Municipal area:

In the Witzenberg municipal area the activities around towns are essentially agriculture based, with the towns being "agricultural service centres", with some agri-processing as well, related to wine, fruit, vegetable and other niche products. The proposed Agri Parks development and potential expansion of the agricultural sector will further stimulate economic growth in this municipal area.

Some places are well-known for their niche-products, like Ceres for its nearby cherry orchards in the mountainous hinterland. Parallel to agriculture, this municipal area is also strong in the tourism field, catering for Cape Town and other Western Cape day- and weekend tourists as well as up-country seasonal tourists. Once again, the continuation of diversified agriculture, some forestry and river fishing strengthen the attractiveness of the area for outside visitors. In addition, the diversity of small towns interspaced with farms and other rural sights (like snow-capped mountains) make the area particularly attractive for short-term visitors. The fact that these destinations are just a short distance from the N1 (and a mere 150-200 km from Inner-Cape Town) further adds to the comparative strength of the area for tourists

3.2.4 Langeberg Municipal area:

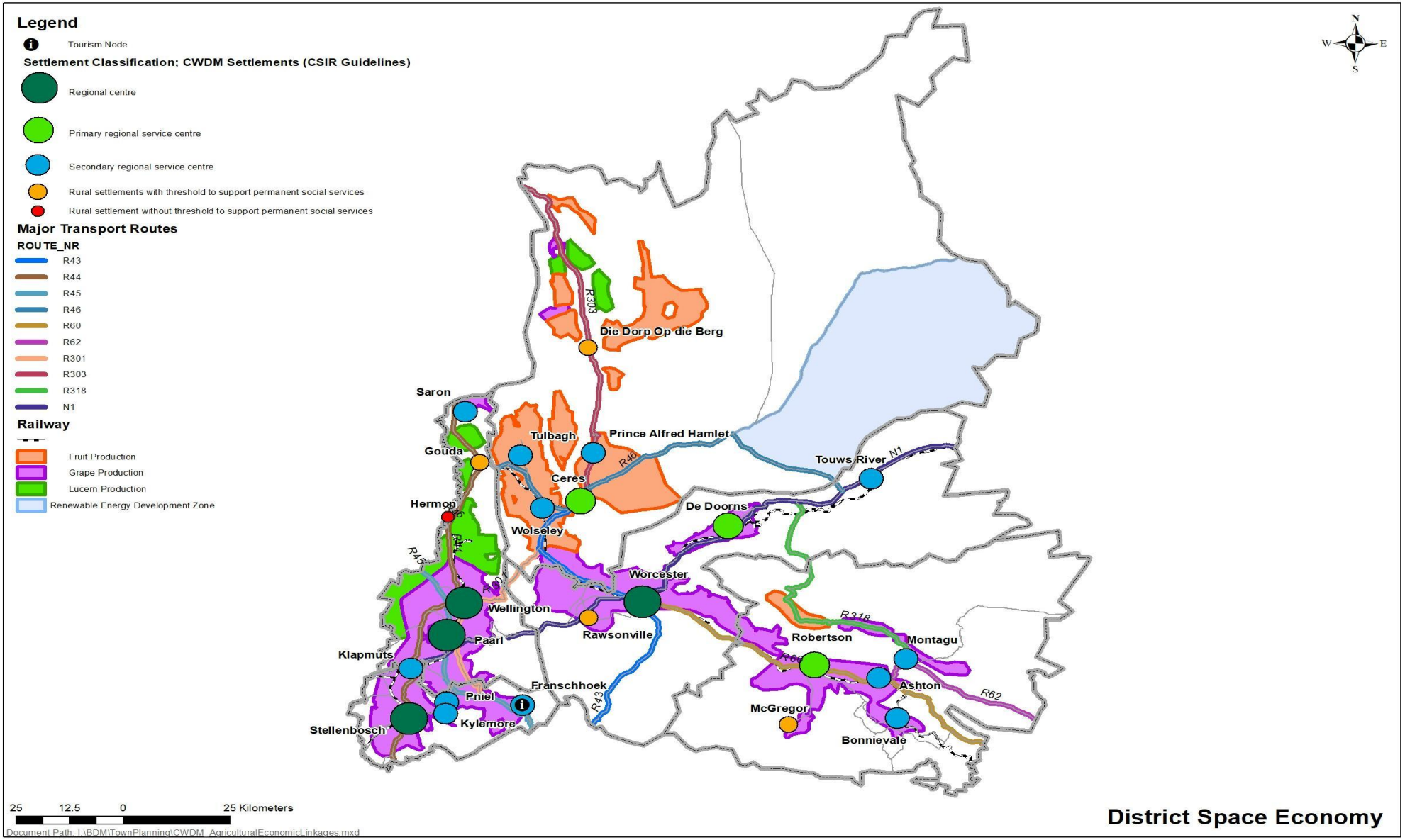
Although the Langeberg municipal area has certain parallels with the Witzenberg area, there are also distinct differences, such as a relatively lower population growth.

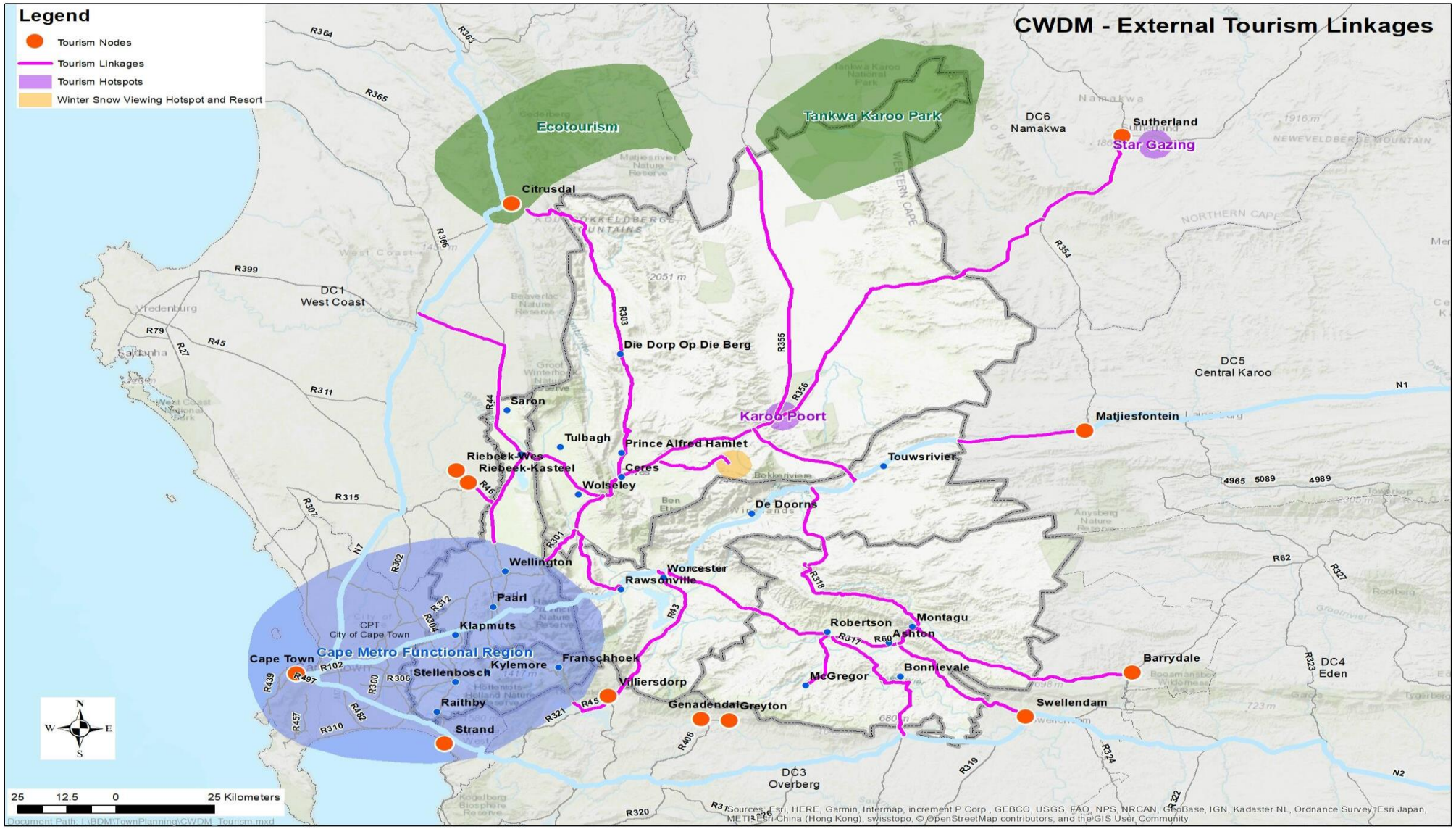
The Langeberg area is far more strategically located, with the R60- south, linking with the N1, the R317 with the Overberg and the R60-north with Worcester as well as the N1 and the northern cluster of the district. In addition, Montagu provides the links to the R62, which is the main tourism route through the Klein Karoo, including Oudtshoorn and other Eden destinations.

While Ashton is the industrial centre of the cluster, Robertson is the largest town and has the broadest economic base. This is further enhanced by its closeness to Worcester and its central location vis-à-vis the other places in the cluster. Local economic development in this area is based on:

- diversified agriculture (including wine/grapes)
- tourism (catering for day, weekend, event, 'route', adventure/sport, health and cultural tourists)
- agri-processing
- retirement settlement
- other small-town functions

It is important to be aware of the opportunities arising out of the complementarity of these growth sectors. If anything, the diversity factor is even stronger here than in the Witzenberg area, although the respective towns are relatively small, so that economics of scale are not easily achieved. The proximity to both the N2 and the N1 is, however, a further advantage. Map 13 (below): CWDM Economic linkages, connecting routes, Settlements Classifications and tourism corridors.


Legend
Tourism Node
Settlement Classification; CWDM Settlements (CSIR Guidelines)
Regional centre
Primary regional service centre
Secondary regional service centre
Rural settlements with threshold to support permanent social services
Rural settlement without threshold to support permanent social services
Major Transport Routes
ROUTE_NR
R43
R44
R45
R46
R60
R62
R301
R303
R318
N1
Railway
Fruit Production
Grape Production
Lucern Production
Renewable Energy Development Zone
N
W
E
S
Die Dorp Op die Berg
Saron
Tulbagh
Prince Alfred Hamlet
Gouda
Touws River
Ceres
Hermon
De Doorns
Wolseley
Worcester
Wellington
Rawsonville
Paarl
Robertson
Montagu
Klapmuts
Franschhoek
Pniel
Ashton
Kylemore
McGregor
Stellenbosch
Bonnievale
25 12.5 0 25 Kilometers
Document Path: I:\BDM\TownPlanning\CWDM_AgriculturalEconomicLinkages.mxd
District Space Economy



Map 14: External tourism linkages

3.2.5 Key findings: District Space Economy *(Economic Growth Sectors & Municipal Space Economy)*

3.2.5.2 Due to various reasons (national and international), there is a decline in the economy of the Cape Winelands District. The sectors that performed the strongest is sectors located within the urban space economy therefor Public-Sector investment remains crucial. Spatial targeting as coordinated by the Western Cape Provincial Government and pursued by various other government departments could assist in guiding public-sector investment. The latter however does not detract from the importance of the agricultural sector and its economic linkages to the urban economies within the district.

3.2.5.2 Opportunities exist in the green and knowledge economy (refer to 3.1.1), municipalities/government must investigate these sectors and capitalise on it.

3.2.6 Implementation proposals

RESPONSIBILITY:	FOCUS AREA: DISTRICT SPACE ECONOMY: ECONOMIC GROWTH SECTORS & MUNICIPAL SPACE ECONOMY
Category B Municipalities in partnership with CWDM	1. Stellenbosch Municipality: to watch carefully how growth impacts on the environment, on its "urban edge" and on the competition between different land uses; create a conducive policy environment to facilitate land use that strengthen sustainable economic growth sectors. 2. Drakenstein Municipality: view the current sector structure of this urban area in a positive light (sector base is broad and the different growth sectors complement each other well); create a conducive policy environment to facilitate land use that strengthen sustainable economic growth sectors 3. Breede Valley Municipality: improvement of service delivery to existing enterprises and households to prevent them from moving elsewhere or getting into profitability crises; ensure the closest possible interaction and co-operation between the public and the private sector; as far as poverty and unemployment pockets are concerned to facilitate the movement of households to larger urban areas may be as relevant as ad hoc social support and improvements in the most basic infrastructure services. 4. Witzenberg Municipality: be aware of the need to increase revenue base to ensure service delivery and maintenance of municipal services. 5. Langeberg Municipality: encourage the rationalization of agriculture and industry 6. Strengthen the linkages between nodes/settlements to improve access for households from the areas with less economic potential to areas with greater potential to access employment and social opportunities. 7. Consider tourism nodes outside municipal boundaries that attracts traversing traffic; these tourism routes must be considered as potential development corridors (promoting land uses that comply with relevant Integrated Zoning Schemes and Municipal Bylaws). 8. Optimize tourism potential of prominent tourist attractions/destinations.

	9. B-municipal Spatial Development Frameworks must facilitate spatial targeting processes, coordinating and identifying government infrastructure/capital investment locations within the urban settlements. 10. Seek partnerships with industries, local businesses, academic institutions, NGO's and other civil society stakeholders to promote interventions in skills trainings as well as research and the utilization of research. 11. Prioritise the implementation of the following drivers: "smart living and working", "smart mobility", "smart eco-systems", "smart agri-production", and "smart enterprise" (Western Cape Government, 2013a) (Van Niekerk, Brent and Musango 2013). 12. Strengthen rural support programmes for commercial and small-scale farming and develop the potential of the agricultural value chain. 13. Attract outside investors or entrepreneurs and encourage further diversification of local business.
PRIORITY:	HIGH

3.2.7 CWDM Implementation Plan: District Space Economy

PROJECT/ACTIVITY:	BUDGET:	RESPONSIBLE DIVISION:	DURATION:	IDP, SERVICE DELIVERY BUSINESS IMPLEMENTATION PLAN (SDBIP) STRATEGIC OBJECTIVE (SO) REFERENCE:
Tourism training	R950 000, 00	Local Economic Development	Annually	SO 1; 1.4
Tourism month	R36 000, 00	Local Economic Development	Annually	SO 1; 1.4
Mayoral Tourism Awards	R35 000, 00	Local Economic Development	Annually	SO 1; 1.4
Educationals	R300 000, 00	Local Economic Development	Annually	SO 1; 1.4
LTA Projects	R450 000, 00	Local Economic Development	Annually	SO 1; 1.4
Tourism Campaign	R528 000, 00 year 1; R109 000, 00 outer years	Local Economic Development	Annually	SO 1; 1.4
Tourism Events	R477 000, 00	Local Economic Development	Annually	SO 1; 1.4

Township Tourism	R500 000, 00	Local Economic Development	Annually	SO 1; 1.4
Investment Programme	R680 000, 00	Local Economic Development	Annually	SO 1; 1.4
Mentorship Programme	R750 000, 00	Local Economic Development	Annually	SO 1; 1.4
Business retention expansion	R700 000, 00	Local Economic Development	Annually	SO 1; 1.4
Skills Development	R1500 000, 00	Rural and Social Development	Annually	SO 1; 1.4
Small Farmer Support	R500 000, 00	Local Economic Development	Annually	SO 1; 1.4
Entrepreneurial Seed Funding	R500 000, 00	Local Economic Development	Annually	SO 1; 1.4
Life Skills workshops	R72 000, 00	Rural and Social Development	Annually	SO 1; 1.5

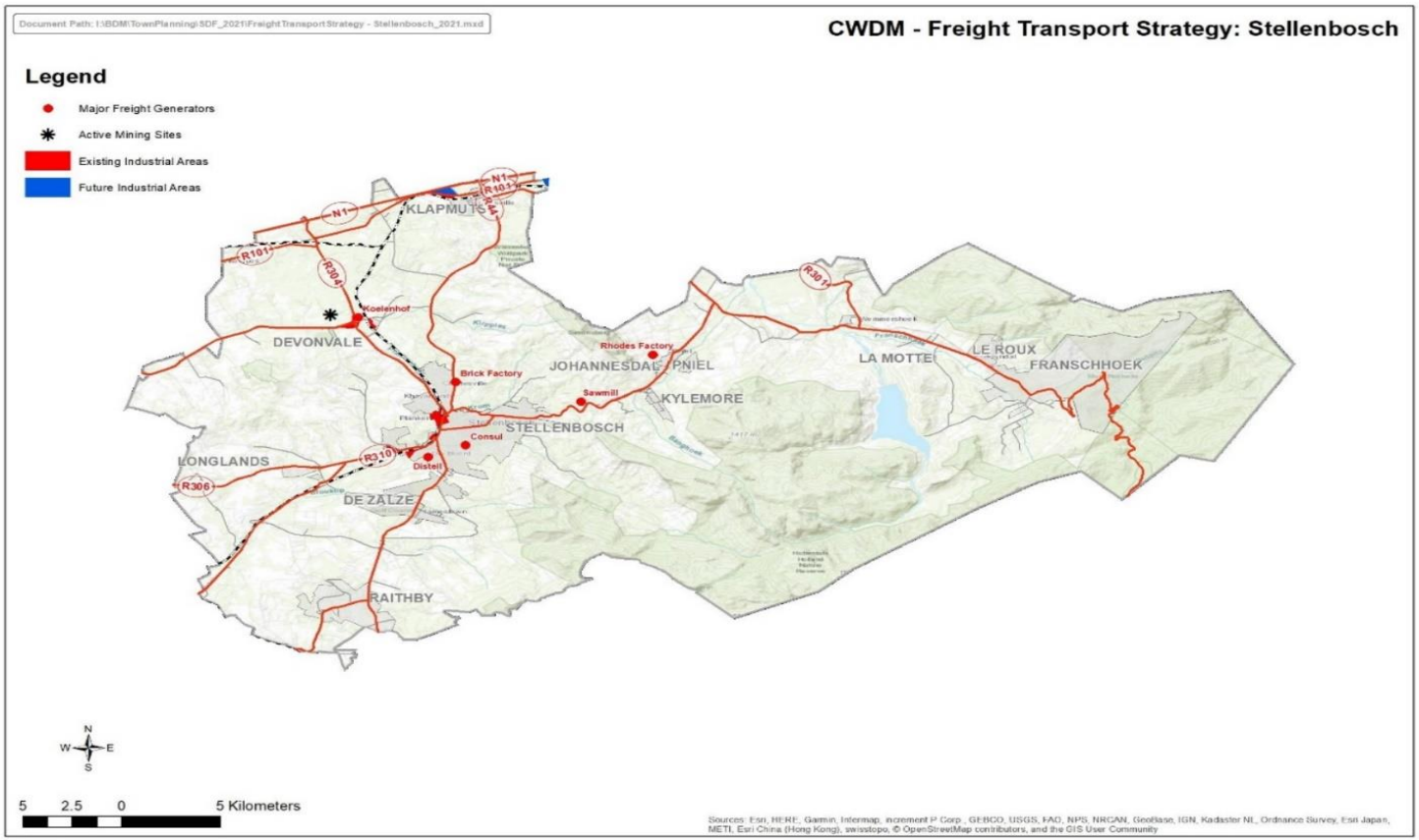
3.3 FREIGHT TRANSPORT AND ROUTES

According to the Cape Winelands Freight Transport Strategy (2013) the total freight volumes by surface transport (road and rail), as well as the volumes by rail analysis show that road freight is the most dominant freight mode currently in the CWDM and is likely to continue in the near future. Currently more than 95% of all freight will continue to be moved via road. Consultations with the Transnet Freight Rail (TRF) who developed a Transnet Transport and Demand Model (2007) confirmed that the TRF does not foresee any rail network improvements in the next 20 years to accommodate freight movement. The existing rail network is deemed adequate to accommodate the expected increase in rail freight in the next 20 years.

Land use that has an impact on freight within the CWDM area is;

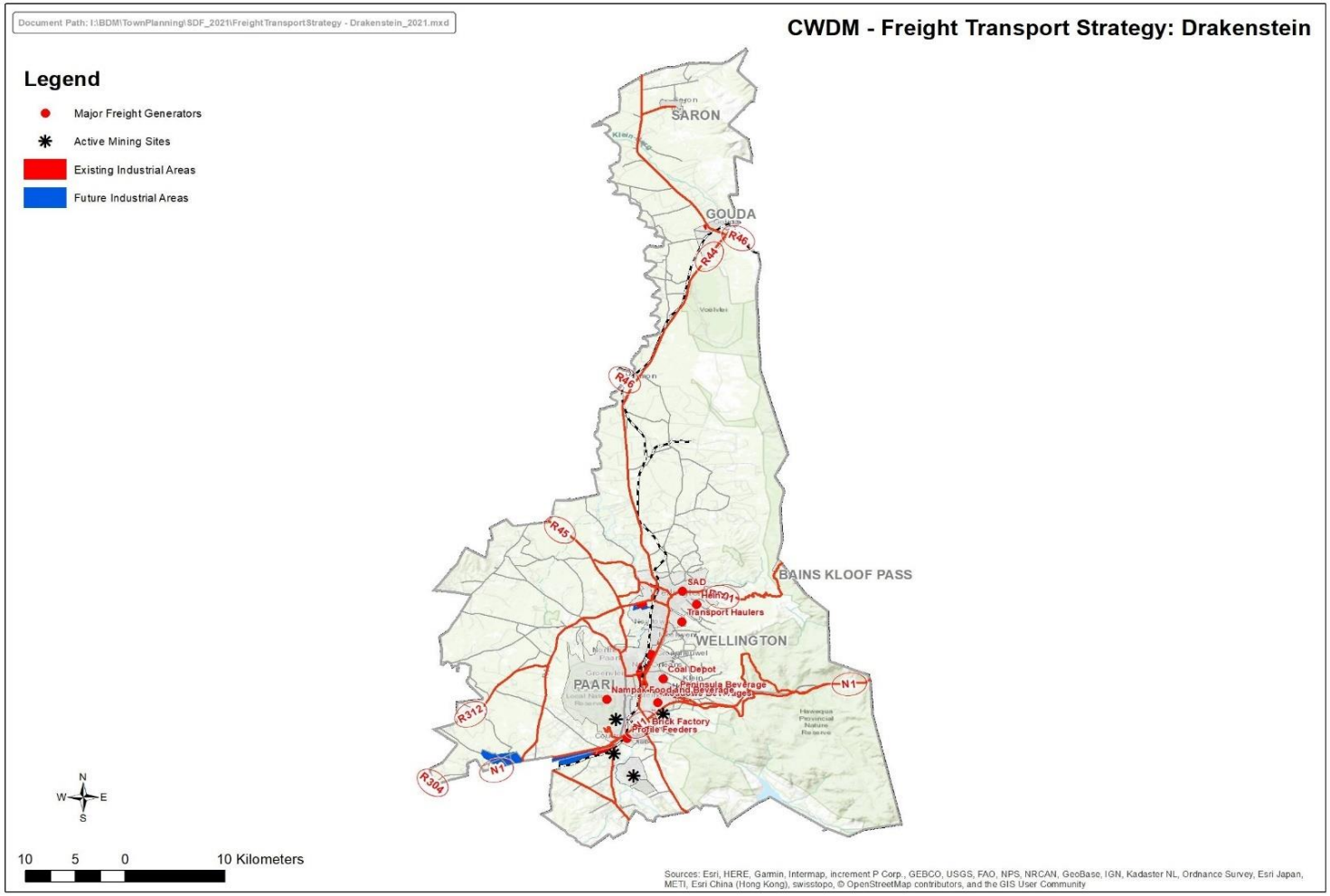
- Mining
- Industry-this refers mostly to industrial areas in towns
- Agriculture and agri-processing. Agri-processing refers specifically to processing that takes place outside of the established industrial areas in the towns of the Cape Winelands Impacted Freight Routes per B-municipal area;

3.3.1. Stellenbosch Municipality/follows:



Map 15; the distribution of wine cellars and the agri-processing plants (major freight generators), as well as the location of industry in the Stellenbosch area illustrates that the main routes that connect Stellenbosch to Somerset West (the R44), Kuils River (R310), Klapmuts (R44), Brackenfell (R304) and Franschhoek (R310), as well as the R45 between Franschhoek and Paarl, carry significant amount of freight. In addition, secondary routes that provide access to farming areas off these routes also carry freight in the form of inputs into agri-processing (e.g., delivery of bottles) and distribution of the finished product (e.g. delivery of wine to the Cape Town Harbour for export).

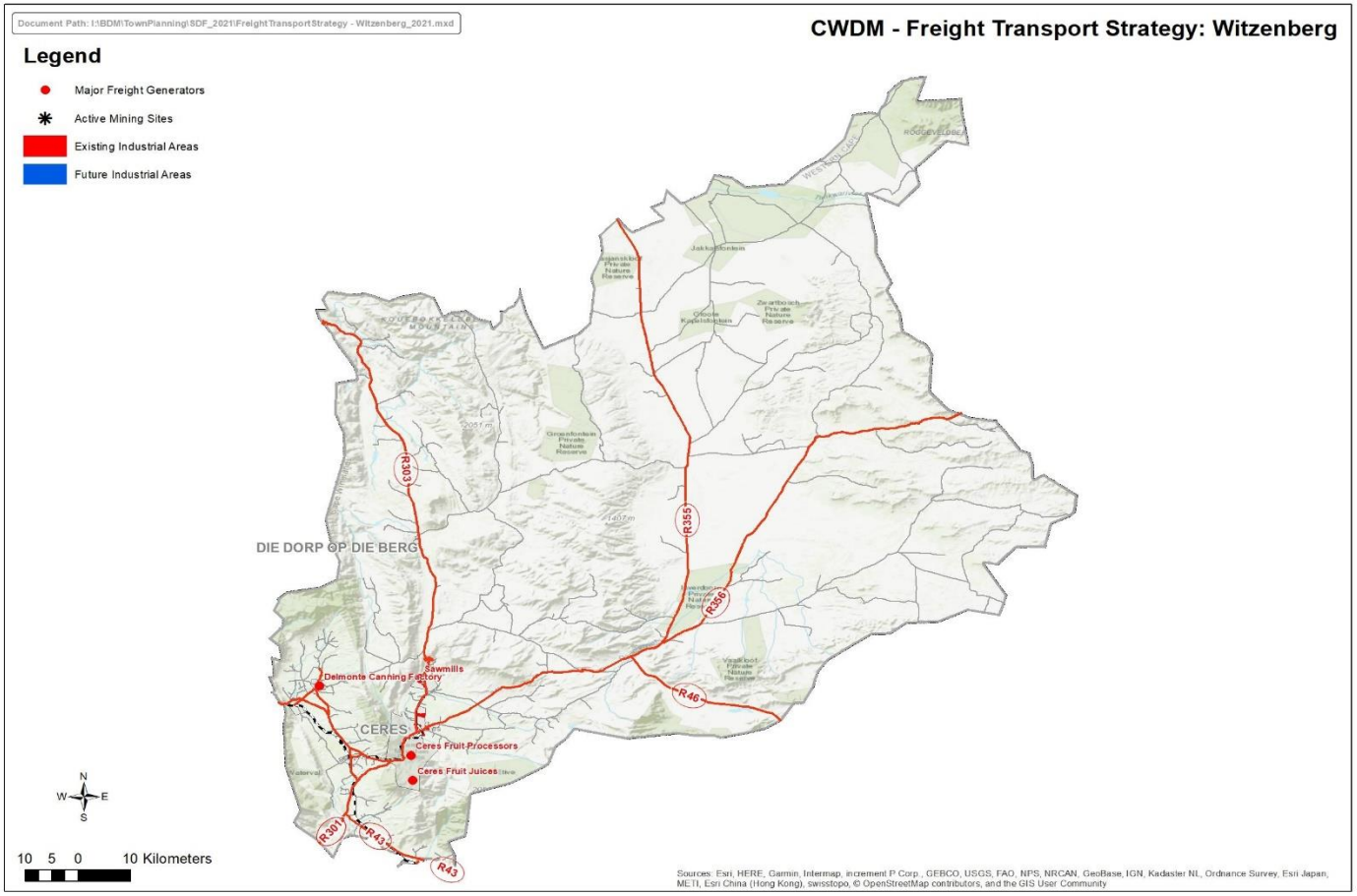
3.3.2 Drakenstein Municipality



Map 16 (above); the R44 between Wellington and the N1, the R45 which connects Wellington to Gouda, Tulbagh and beyond and the R101 (Old Paarl Road) running parallel to the N1, Jan van Riebeeck Drive between Wellington and Paarl which connects to the N1 further south, and the R301 and R45 serving the

Simondium Groot Drakenstein area, are important freight routes in the municipal area. The large number of freight companies situated in the area adds to the burden of heavy vehicles on these roads. Take out towns and blow up-check routes)

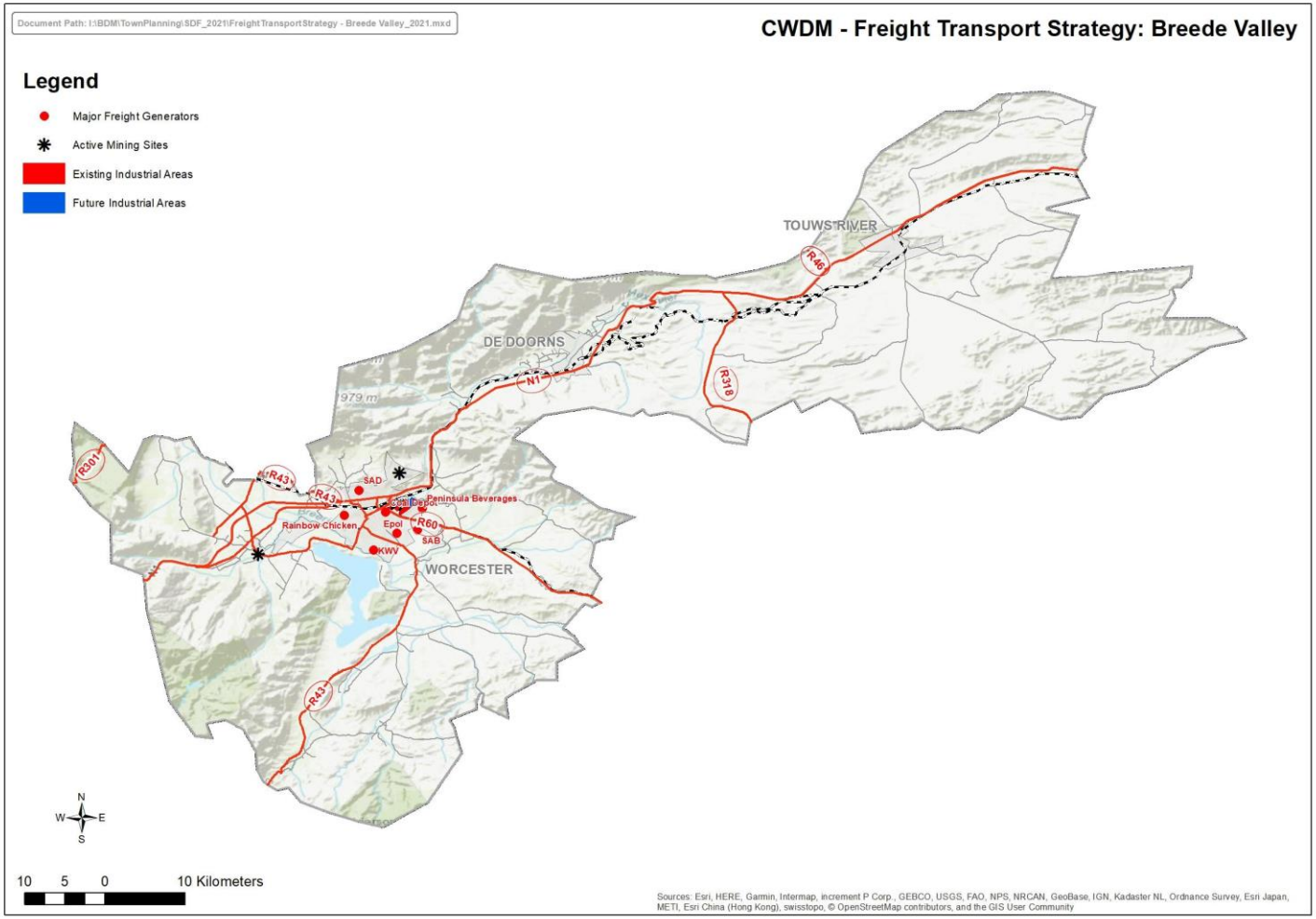
3.3.3 Witzenberg Municipality



Map 17 (above); The transportation of high-quality fresh fruit and vegetables for export purposes is critical to the economy of the Witzenberg local municipality. Roads that are in a poor condition causes damage to the fruit which impacts negatively on grading and the selling price of the fruit. Important freight routes in this area includes the R301 to Op -die Berg and beyond, the R46 between Ceres and Gouda and the R44 from Gouda which then connects to the N1, and the R46 between Ceres and Touws River. The R43 between Ceres and Worcester are also important, it is used to transport packaging material for agri-processing in Witzenberg.

In addition to the quality of roads used to transport fresh produce, the fact that heavy vehicles en route between the N1 and the West Coast and other parts of the Western Cape pass through the town of Ceres (on Main Road) has been noted as a concern. The introduction of a weighbridge in the area has been put forward as a solution to at least discourage heavy vehicles who try to avoid weighbridges on the N1 to use this route.

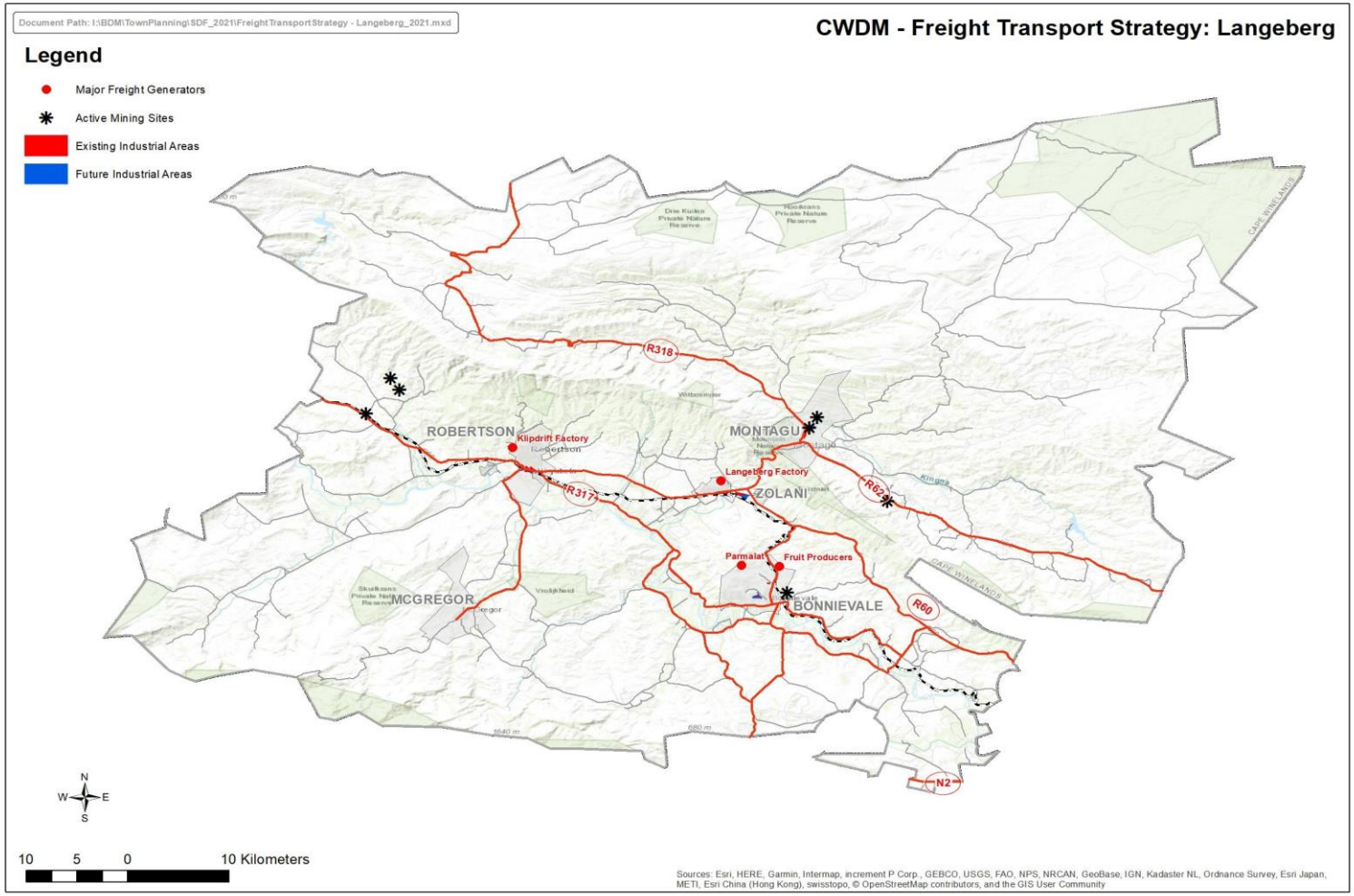
3.3.4 Breede Valley Municipality/ follows



Map 18 (above)); freight generators in the Breede Valley are generally located close to major routes such as the N1 and the R60(to Robertson) and the R43(to Ceres), such as the high valuable table grapes crops of the Hex River Valley. Local officials noted the problem with heavy vehicles passing through the centre

of Worcester en route to and from the R60 as an issue. The planned eastern bypass to the town, that will also provide additional access to its industrial area will solve this problem once implemented.

3.3.5 Langeberg Municipality



Map 19 (above); the R62 and the R60 (from Ashton to Swellendam) are the most important freight routes in the Langeberg Municipal area, as they are used to distribute the produce of the region to the market. In addition, all roads that carry fruit to Ashton for processing is of vital importance to the local economy, including the route between Montagu and Ashton which is in the process of being upgraded. The historical and scenic value of the route will however possibly not result in increased carrying capacity. The R317 between Bonnievale and Robertson is also important as it provides access for local wine cellars and the Parmalat plat in Bonnievale.

3.3.6 Key findings: Freight Transport and Routes

3.3.6.1 Many of the Issues (Table 20) indicated by the CWDM Public Transport Regulation Section relate to locational inefficiencies of logistical distribution facilities. Products from the CWD is transported to Epping, Bellville etc. and then redistributed back to the CWD towns. i.e., fruit being transported to the Drydock in Bellville, Wine, dairy products being distributed to facilities in Epping and then transported back. Further logistical distribution inefficiencies are due Company procurement policies and internal economy stimulation e.g., Ceres Fruit Juice/Pioneer purchasing their packaging material at a "sister" company in Durban as opposed to purchasing the material at a company in Worcester.

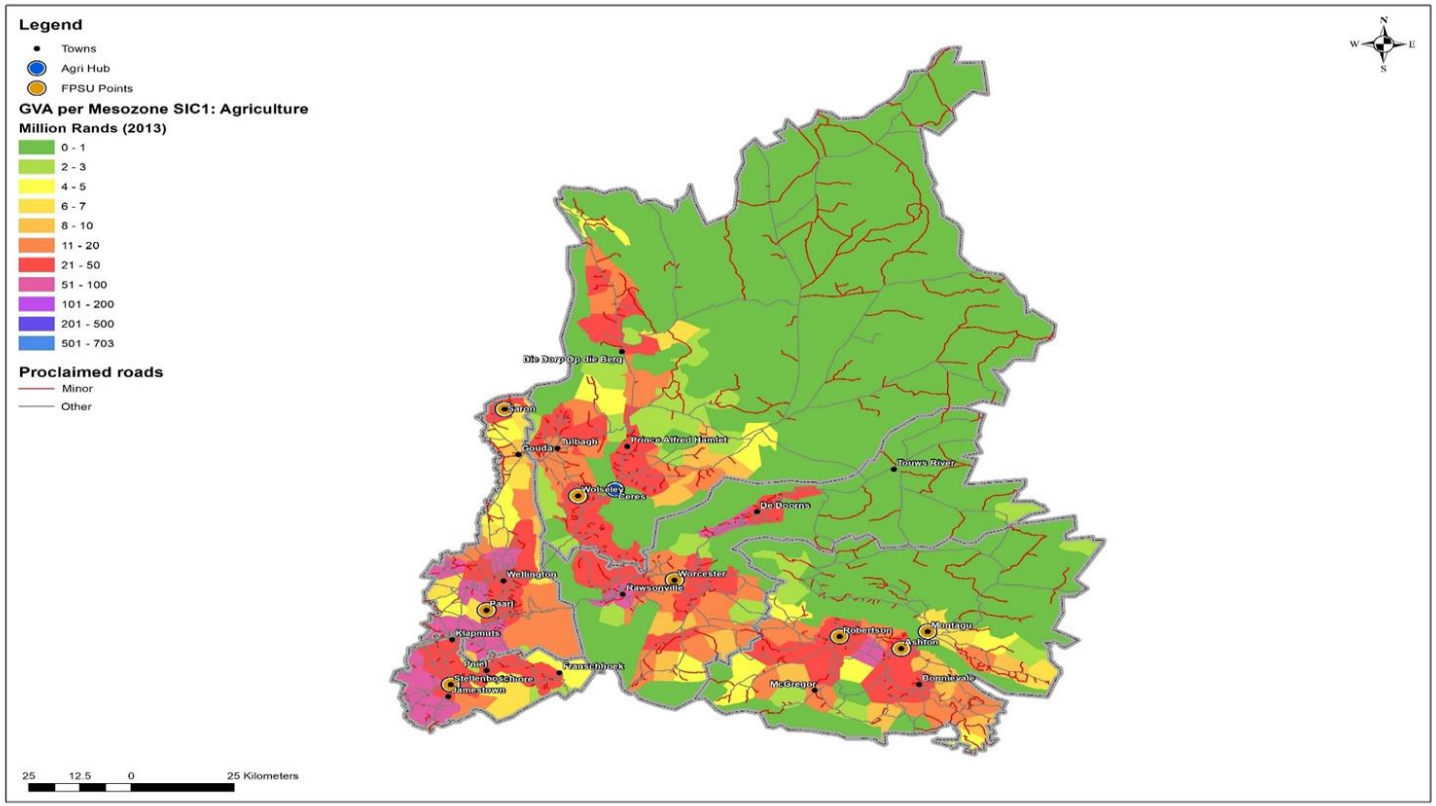
Table 21: Key issues and suggestions for freight and related routes.

Organisation	Issues	Suggestions
Imperial Cargo	• Vehicle movement through Paarl CBD area towards N1	• Upgrading of the Bo-dal Road to be able to accommodate heavy vehicles
Parmalat	• The R60 between Bonnievale and the N2 is closed to traffic after a large section collapsed • Operational efficiency at overloading control points	• Upgrade and maintenance of the R317 through Bonnievale to the N2 • Improve operational efficiency
APL Cartons	• Location of the weighbridge • Unreliability of rail service is main reason for not using it	• Truck stop facility (100 - 150 trucks) needed in Worcester • Improve rail service as it is ideally suited for inbound freight
Ceres Beverage Company	• Operational efficiency at overloading control points	• Improve operational efficiency • Improve rail service and it could be used by many in Ceres • CWDM could assist in driver training and education

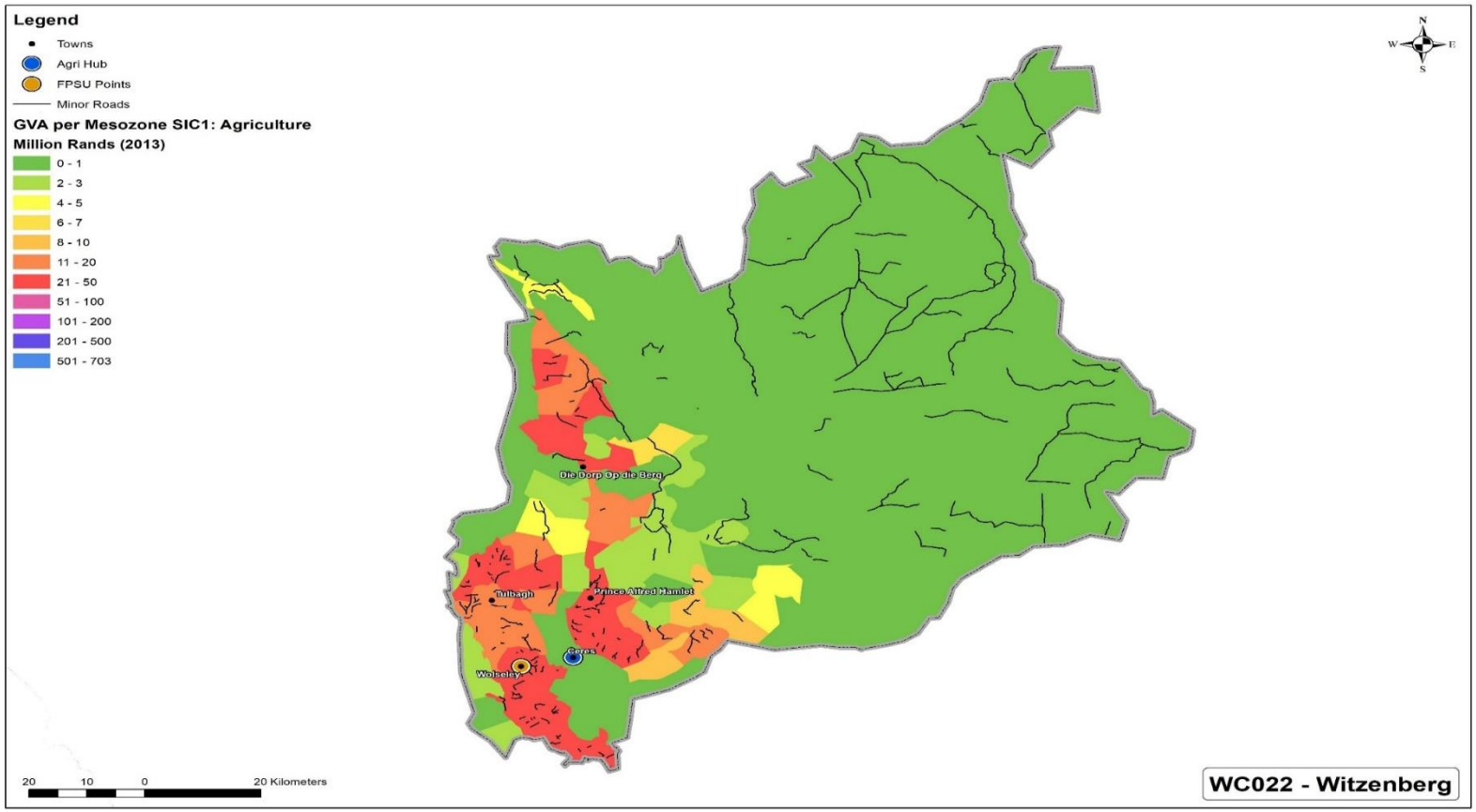
	• Will make use of rail if there could be a siding at CBC	
KWV	• Operational efficiency at Port in Cape Town • Lack of rail service to transport bulk wine	• Improve rail service and it could be used by many in Wellington
Unitrans	• Conditions of the rural roads • Impact of roadwork on cost (summer) • Access to the area north of the N1 in Worcester as trucks may not use N1/R60 IC • Heavy vehicle traffic in the main road of Worcester • Truck stops; drivers avoid stopping at the truck stops	• Knowledge and communication around road works and condition of the roads • The Worcester bypass, with the inclusion of a link between the R60 and the R40 • Improve truck stops
Windmeul Eggs	• Traffic congestion on the roads towards Cape Town • The condition of the roads has a negative impact on costs. • Operational efficiency at overloading control points	• Improve operational efficiency at overloading control points
Distell	• Lack of rail service to transport bulk wine • Operational efficiency at Port in Cape Town • Operational efficiency at overloading control points	• Improve rail service • Improve operational efficiency • Improve operational efficiency
Hortgro	• Minutes	• Congestion at the entrance of the port in Cape Town. • Bypass opportunities on the R45 between Gouda and Wellington • Heavy vehicles with fruit greatly affect Ceres and Paarl.

3.4 AGRI PARKS DISTRICT LEVEL IMPLEMENTATION: SPACE ECONOMY LINKAGES

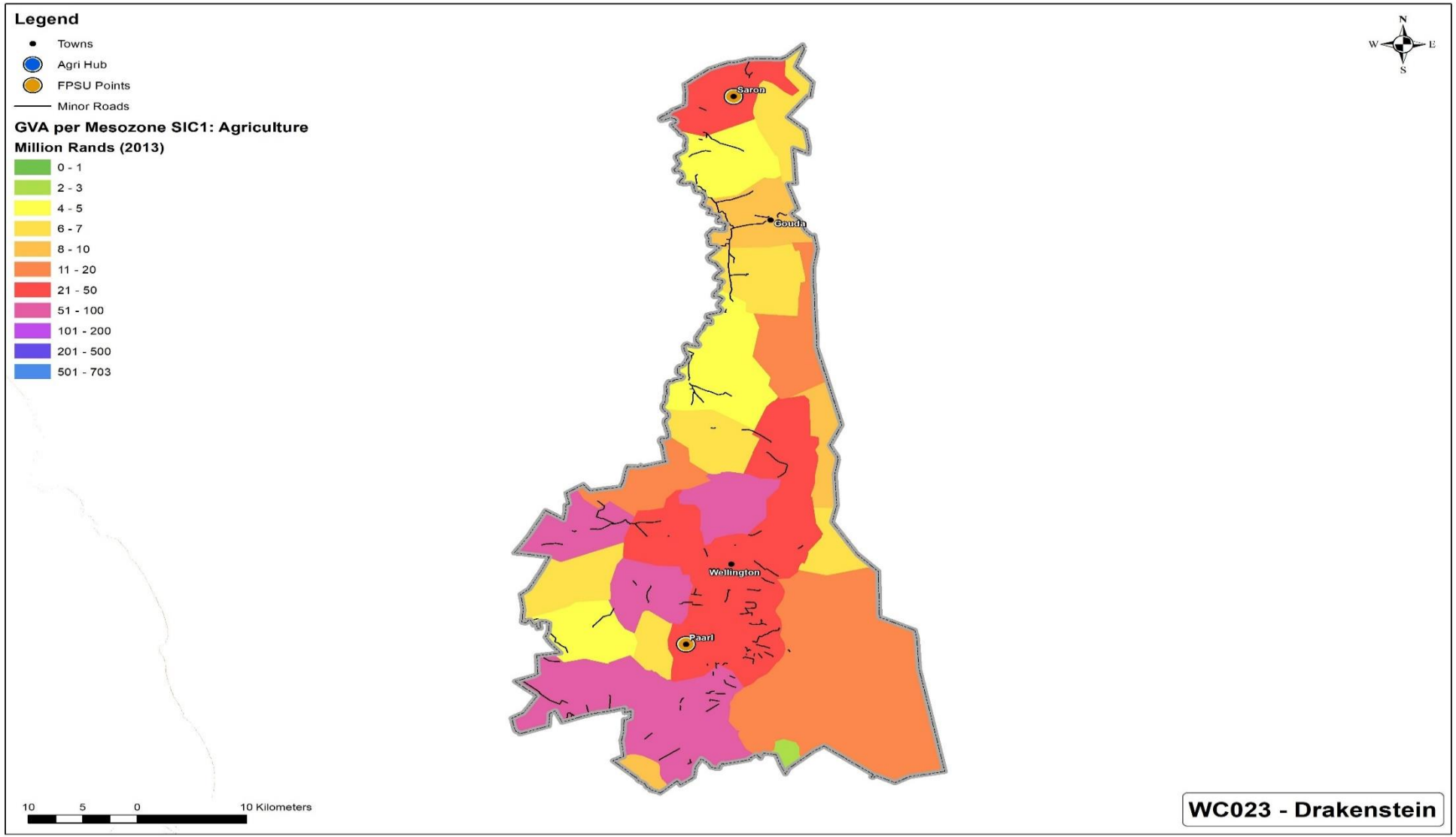
The Department of Rural Development and Land Reform (DRDLR) will be focussing resources and budgets on the various catchments surrounding the identified Farmer Production Support Units (FPSU's). These catchments have been identified based on a 30km distance along the existing road network and will enable various role players to target suitable strategic land for production support as well as land reform purposes. The DRDLR has prioritised Agri-park implementation in Saron, Stellenbosch, Ceres for the 2017/18 financial year and Paarl, Robertson, Montagu, Ashton and Worcester for the years thereafter. Here the focus will be on the establishment of the necessary Farmer Production Support (FPSU) Infrastructure as well as support to emerging farmers and the local community within the FPSU catchments.



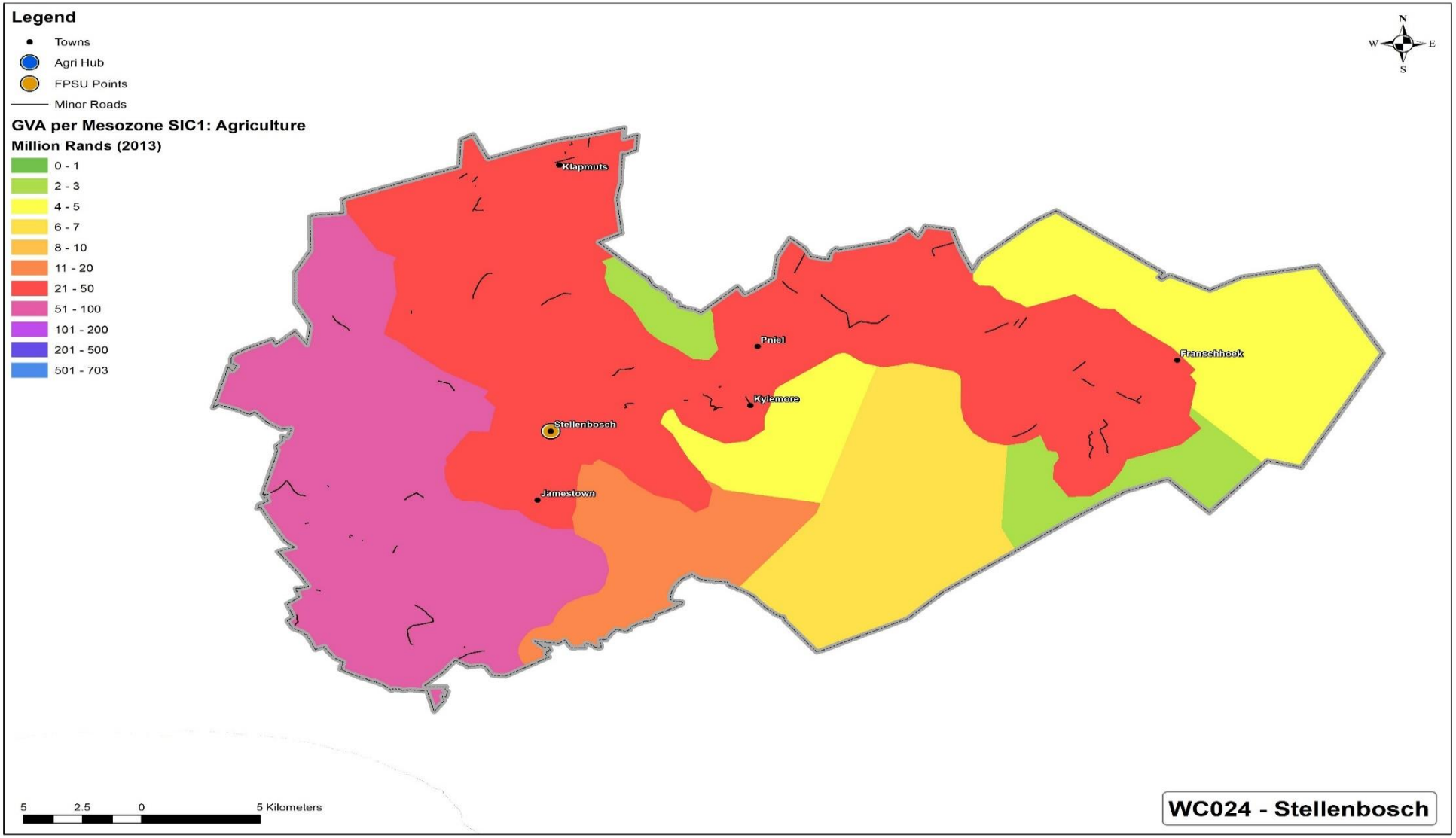
Map 20(above) illustrates the proposed Agri Park Components, Farmer Production Support Units (FPSU) and Agri Hub (Ceres) and Gross Value Added per Mesozone in terms of Agricultural production and important minor and primary routes. The CWDM fulfil a Roads agency function on behalf of the Western Cape Provincial Government. This function entails maintaining provincial roads but does not include important minor roads that are used by the agricultural sector due to insufficient funding that is provided by the Western Cape provincial government. It is crucial that these minor roads that at least fall within the middle to high end mesozones must be maintained due to regular use for transporting goods from these areas.



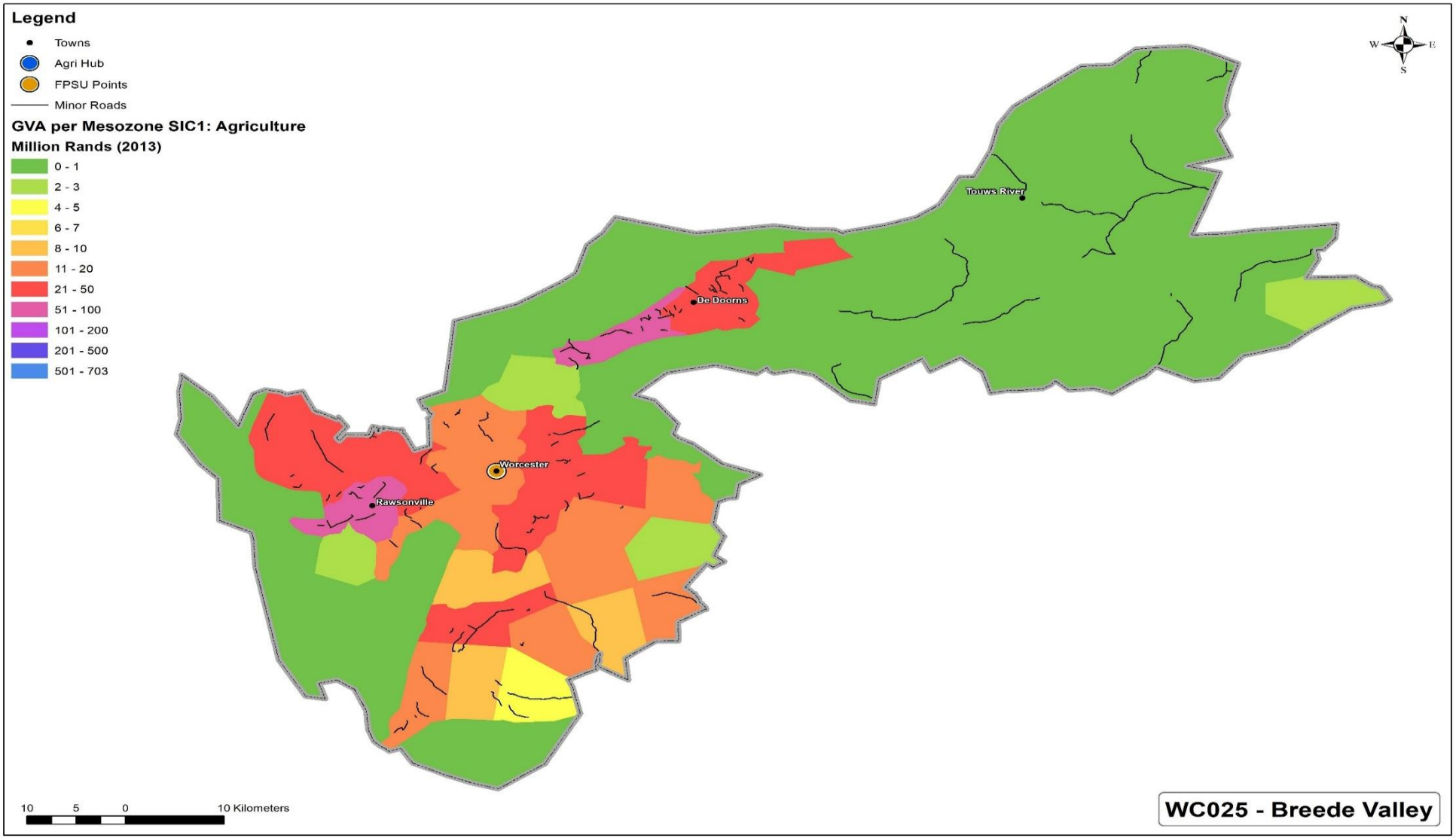
Map 21: Witzenberg agricultural mesozones and minor roads.



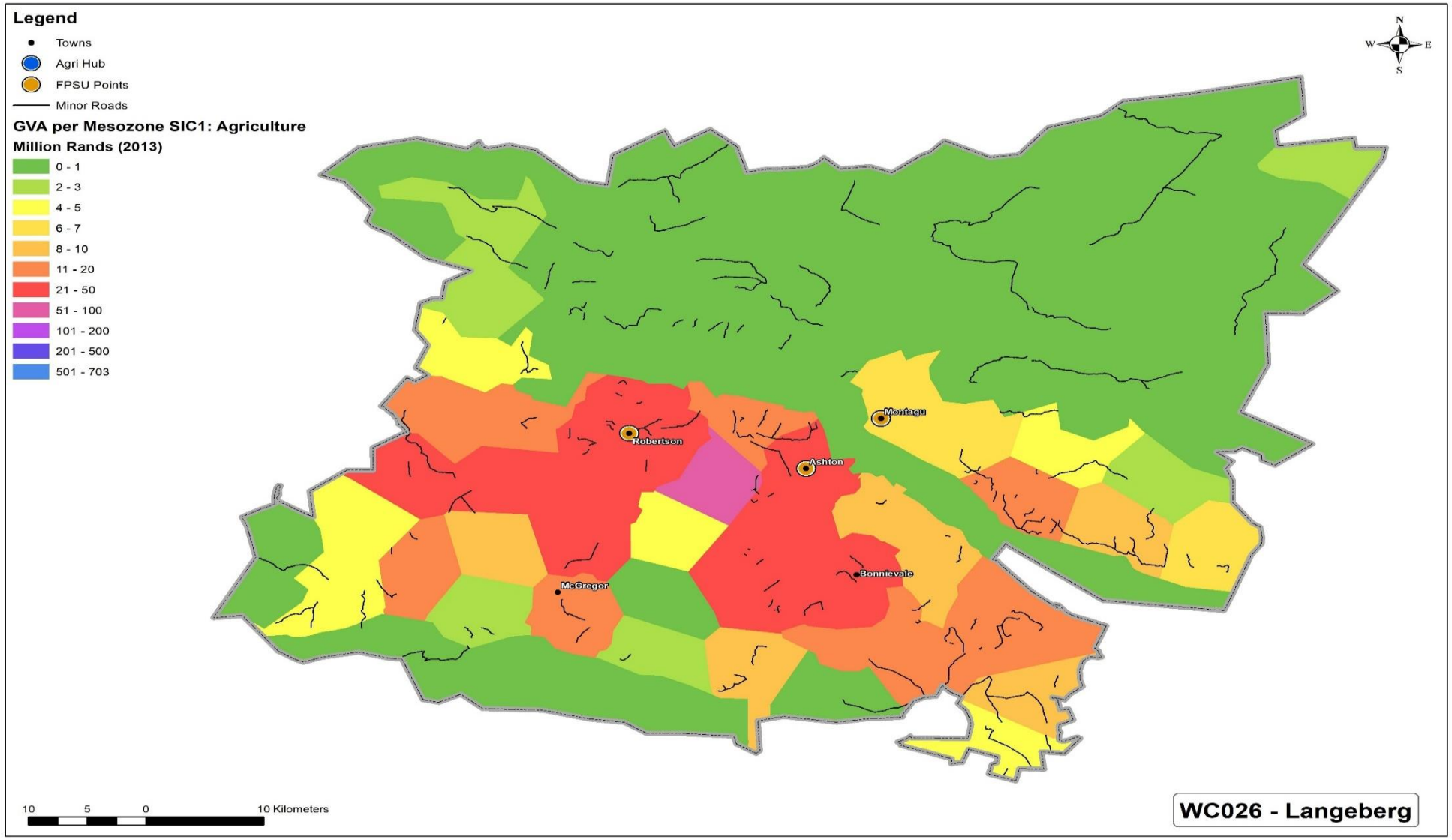
Map 22: Drakenstein agricultural mesozones and minor roads.



Map 23: Stellenbosch agricultural mesozones and minor roads.



Map 24: Breede Valley agricultural mesozones and minor roads.



Map 25: Langeberg agricultural mesozones and minor roads.

3.4.1 Key findings: Agri Parks District Level Implementation: Space Economy Linkages

3.4.1.2 Support is needed from all relevant stakeholders (National, Provincial, Local Government, NGO's and private sector) to ensure that the Agri Parks proposal is implemented successfully.

3.4.1.3 The CWDM fulfil a Roads agency function on behalf of the Western Cape Provincial Government. This function entails maintaining provincial roads but does not include important minor roads that are used by the agricultural sector due to insufficient funding that is provided by the Western Cape provincial government. It is crucial that these minor roads that at least fall within the middle to high end mesozones must be maintained due to regular use for transporting goods from these areas (refer to map 21).

3.4.1.4 The Department of Rural Development and Land Reform proposes the following agriculture related projects [Draft Rural Development Plan for the CWDM, 19 December 2016];

Table 22: Agriculture projects; Livestock

Project Name	Project Description	Project Driver
Small scale farming on municipal commonage	This project entails the establishment of farming opportunities for existing small scale livestock farmers.	Witzenberg LM
Increasing the size of the communal in De Doorns	Communal land in De Doorns is being used for the grazing of livestock in the area. The demand for this land is exceeding supply, it is therefore proposed to make more land available.	To be determined (possibly Breede Valley LM)
The use of grey water for the irrigation of communal pasture	There is currently not enough water to irrigate the communal pasture in Worcester. It is therefore proposed that grey water/treated wastewater be used for irrigation.	To be determined (possibly Breede Valley LM)
Agrarian reform program (Klapmuts)	This project entails the facilitation of grazing opportunities for small scale farmers on vacant land (portions of Erf 736 Klapmuts) and to support the local food chain	Drakenstein LM, CWDM

Commonage livestock pen in Ashton	Overcrowding of livestock and inappropriate housing of livestock has led to the realisation of the need for a livestock enclosure in the town of Ashton.	To be Determined
Osdam abattoir	This is an agri parks project aimed at increasing the meat processing capacity in Ceres (Skoonvlei industrial park). The abattoir will process sheep and cattle to produce red meat.	DRDLR
Local mobile egg farming operation	This is a mobile egg farming business. The owner of this business has been in operation for the past 43 weeks. He is currently seeking funding from DRDLR to expand his business as he believes there is considerable scope for demand for his product in the area.	To be determined

Table 23: Agriculture projects; Crops

Project Name	**Project Description**	**Project Driver**
Cape Winelands District Municipality Skills Development	This project forms part of the Agri Parks Initiative and entails the skills development of the small holder farmers and farm workers in small scale agriculture, the fostering of business partnerships between private and public sector and the promotion of agricultural value chain linkages in the CWDM.	DRDLR
Agri processing hub (Saron)	Consolidate industrial requirements for surrounding farmers and local agriculture at central processing hub for small scale production and packaging. Identify and secure municipal land	Drakenstein LM
Upgrading of infrastructure to connect underutilised land in Worcester	Utilities infrastructure such as electricity cables and water pipes are needed to connect underutilised land in Worcester. It is envisioned that this land can serve the agricultural industry through creating new producers (small holder farmers on lease.)	To be determined (possibly Breede Valley LM)
Provision of an irrigation dam in the Touwsrivier area	It is proposed that an investigation into the provision of an irrigation dam is conducted, this dam is to supplement the available water for small holder farmers in the Breede Valley area.	To be determined (possibly Breede Valley LM)
Increasing the wall of the Brandvlei Dam	The aim of this project is to increase the water storage capacity of the Brandvlei dam. This may create further opportunities for increased agricultural activity.	Breede Valley LM

Agricultural Graduates (2015/16): Skills Development	This is the recruitment and placement of unemployed agricultural graduates on DRDLR: REID land reform projects. Graduates in the Cape Winelands specialise (as interns) in: Animal Production, Hydroponics, Plant Production, Agricultural Economics.	DRDLR: REID
Halaal Industrial park (possibly in Cape Winelands	Establishment of an industrial park dedicated to agri-processing of halaal food products for export and local consumption has been proposed. Cape Town and Stellenbosch has been proposed as possible sites for this project.	To be determined
Selfsorg centre – food garden in Prince Alfred Hamlet	The aim of this project is to enable the community to produce their own food and to beautify the town of Prince Alfred Hamlet. This will contribute to tourist activities as well as promote food security in the town.	WCDoA
Bella Vista food gardens	The aim of this project is to enable the community to produce their own food and to beautify the town of Bella Vista.	WCDoA
Bella Vista bakery	This project entails the funding of the construction of a bakery in Bela Vista which will focus on the processing of agricultural produce and the production of confectionary and pastry foods.	WCDoA/Casidra
Nduli food laboratory	This project will entail the establishment of a food lab in which the quality of food and agricultural products will be tested and graded before distribution.	WCDoA/Casidra
Agri processing plant in Ceres	The market for agri processing is not yet saturated. It has therefore been proposed that a new agri processing plant be developed focusing on the processing of crops such as deciduous and stone fruits.	To be determined
Ceres fruit growers' cold storage	Development of a fruit cold storage unit in the town of Ceres in order to overcome the seasonality of supply (especially of fruit).	Ceres Fruit Gowers Pty (Ltd) & DRDLR: REID

Table 24: Agriculture projects; Agri processing/

Project Name	**Project Description**	**Project Driver**
Small farmers support program	This program supports small scale farmers in the district with the objectives of: • Promoting BBBEE • Creation of alternative income for seasonal and unemployed workers • Address issues of poverty and social development	CWDM

	The program provides direct assistance such as the purchasing of equipment, provision of grants etc.to small scale farmers in various locations in the CWDM.	
Bella fruit cold storage	The BA Kamer company is seeking to build a controlled atmospheric complex (cold storage unit) for pears and apples in Bella Vista in Witzenberg LM. This will create the necessary capacity to meet the high demand for cold fruit storage in the area.	BA Kamer company /DRDLR
Agri life fruit project	This is a 65% black owned agricultural business focusing on agri processing and is situated in the town of Wolseley. The project aims to provide post-harvest services to fruit farmers in the Witzenberg area (mainly around the Ceres-Tulbagh area).	To be determined
CCS cold storage	This project entails the construction of a cold storage unit consisting/making use of 'dynamic control atmosphere' technology to increase the lifespan of fruits in storage. The project will be located in Ceres.	To be determined
Mentoring & training: Nduli	This project focuses on mentoring & training of a vegetable production enterprise which is a supplier to Freshmarkets and Ceres Spar.	DRDLR: REID

3.4.2 Implementation proposals:

RESPONSIBILITY:	FOCUS AREA: AGRIPARKS DISTRICT LEVEL IMPLEMENTATION; SPACE ECONOMY LINKAGES
CWDM, DoA and Department of Rural Development & Land Reform	1. Strengthen rural support programmes for commercial and small-scale farming and develop the potential of the agricultural value chain. 2. Prioritize maintenance of minor roads in higher value mesozones.
PRIORITY:	MEDIUM

3.4.3 CWDM Implementation Plan: Agri Parks District Level Implementation: Space Economy Linkages

PROJECT/ACTIVITY:	BUDGET:	RESPONSIBLE DIVISION:	DURATION:	IDP, SERVICE DELIVERY BUSINESS IMPLEMENTATION PLAN (SDBIP) STRATEGIC OBJECTIVE (SO) REFERENCE:

Road Maintenance	R 119 505 000,00 year 1; R125 130 000, 00 outer years	Technical Services	Annually	SO 2; 2.1
Infrastructure Rural Area Farmers	R1000 000, 00	Projects and Housing	Annually	SO 2; 2.2
Clearing of Road Reserves	R1 300 000, 00 year 1; R 2097 000, 00 outer years	Projects and Housing	Annually	SO 2; 2.2
Small Farmer Support	R500 000, 00	Local Economic Development	Annually	SO 1; 1.4
Subsidy: Water/Sanitation Rural areas/Farms	R1000 000, 00	Municipal Health Services	Annually	SO 1; 1.1

3.5 URBAN AND RURAL GROWTH MANAGEMENT PRIORITIES

The Greater Cape Metro Regional Spatial Implementation Framework (GCMRSIF)dated July 2019 identified various urban growth "hotspots" located in the Cape Winelands District Municipal area which need to be prioritized for inter-municipal planning and growth management interventions. The N1 and N2 gateways were flagged as strategic regional corridors which together with the hotspots are subject to intense development pressures.

3.5.1 Urban and rural growth management priorities: Key findings (GCMRSIF, 2019)

3.5.1.1 De Novo is situated within the Stellenbosch Municipal area, roughly one and a half kilometers from the boundary with the City of Cape Town. De Novo is subject to escalating development pressure given its proximity to the Cape Town Municipal boundary, the Paarl- Cape Town commuter railway line, the R101 and the N1. In the past the node has been used for intensive agricultural purposes as according to the GCMRSIF, it has favorable soil types and access to the Stellenbosch (Theewaterskloof) Irrigation Scheme.

3.5.1.2 Klapmuts has been identified by both Stellenbosch and Drakenstein Municipalities as a prospective sub-regional urban node along the N1. Residential and industrial development opportunities have been identified both north (in the Drakenstein Municipal area) and south (in the Stellenbosch Municipal area)

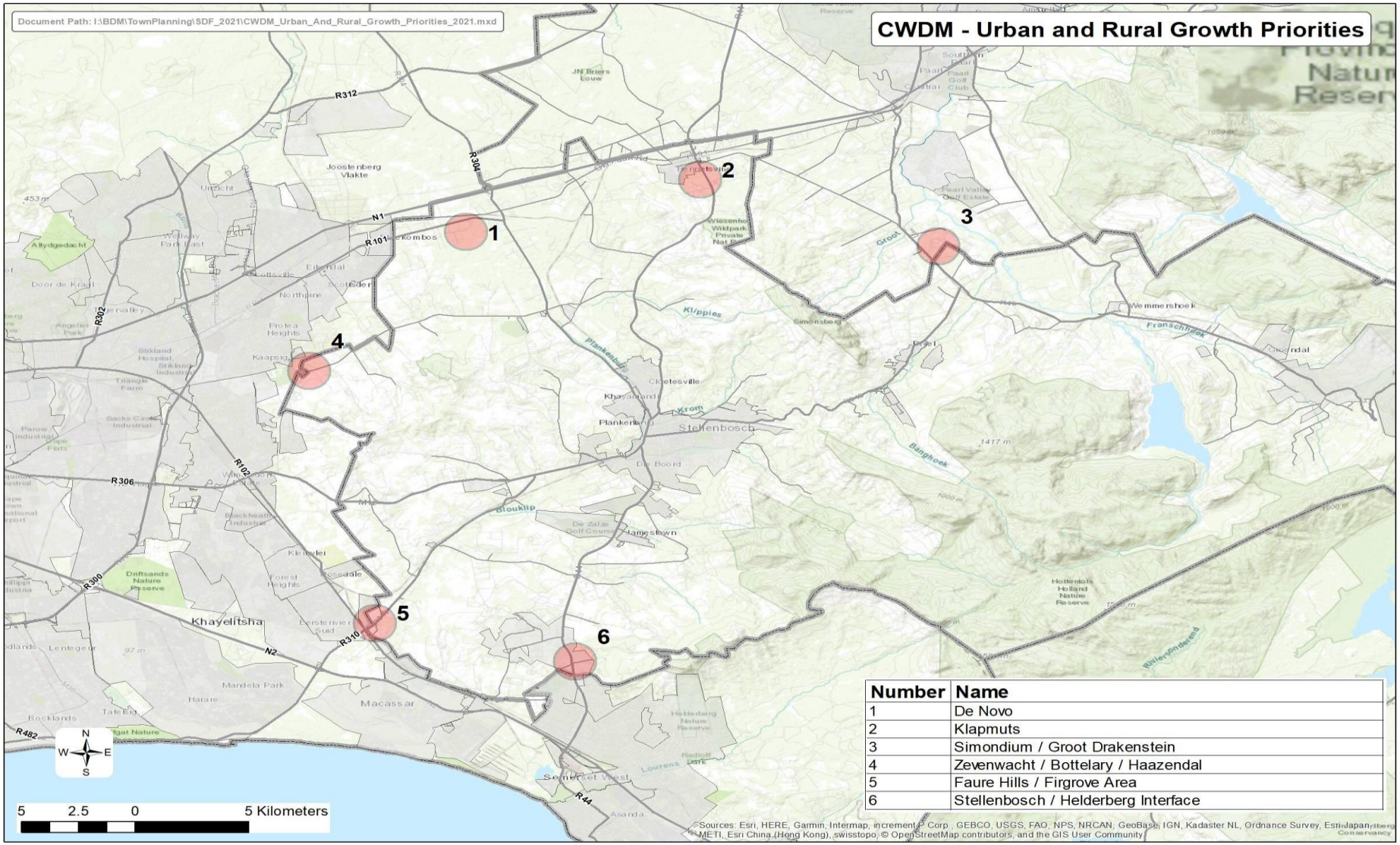
of the N1. A significant new development in Klapmuts south is the Stellenbosch Bridge Development. Phase 1 which is for approximately 1500 residential units has been approved. Phases 2 and 3 include a "Smart City" and a University Precinct. The City of Cape Town also has an interest in the development of Klapmuts given its location on the most significant arterial into the City of Cape Town, namely the N1.

3.5.1.3 Simondium and Groot Drakenstein are close in proximity with the former in Drakenstein Municipality and the latter in Stellenbosch Municipality, the very real threat of ribbon development along the R45 linking the two exists. (The settlements are currently approximately 3 km's apart). This will impact on a scenic tourism route and significant heritage and agricultural working landscapes.

3.5.1.4 Zewenwacht/ Bottelary Hills/ Haasendal area, on the boundary of the City of Cape Town and Stellenbosch Municipality. Within both the City of Cape Town and Stellenbosch Municipality there is immense pressure on this area for golf courses / driving ranges, hotels etc. i.e., uses that are non-agricultural with a strong tourist focus. Bottelary Road is becoming more and more urbanised. This urban growth is eroding the visual amenity of the Bottelary Hills and impacting on the agricultural working landscape, threatening world-renowned vineyards and wineries.

3.5.1.5 Faure Hills/Firgrove; here the residential development within the City of Cape Town boundary directly abuts Stellenbosch Municipality and the "winelands". In this location the pressure for development is so great that the City of Cape Town would like to adjust the municipal boundary with Stellenbosch Municipality to accommodate the future Firgrove Station Catalytic Development. In addition, "Milnerton Estates" have bought almost all the land from Firgrove to Raithby resulting in Stellenbosch Municipality facing consistent development pressure in this area.

3.5.1.6 Helderberg rural Interface; a large part of the reason as to why this is seen as a "hotspot" area is because of the policy disparity between the City of Cape Town and Stellenbosch Municipality regarding how to manage settlement growth. The City of Cape Town supports strict settlement growth management with limited non-agricultural and new settlement development in rural areas, whereas Stellenbosch Municipality supports focusing on "inter-connected nodes, with existing rural and urban settlement transformation through densification and extension. The concern from the City's point of view is that if there is the development or extension of inter-connected nodes in close proximity to the City of Cape Town municipal boundary then there will be demand for similar developments outside of the City's urban edge.



Map 26; Urban and Rural Growth Priorities

3.5.2 Implementation proposals

RESPONSIBILITY:	FOCUS AREA: URBAN AND RURAL GROWTH MANAGEMENT PRIORITIES (GCMRSIF, 2019)
Drakenstein, Stellenbosch Municipalities, City of Cape Town & PGWC, DEADP	1. De Novo: The location abutting the City of Cape Town-Stellenbosch municipal boundary and in close proximity to the Bloekombos settlement necessitates that the two municipalities collaborate in assessing the optimum and sustainable use of the De Novo land. Such assessment needs to be informed by amongst others, the clarification of the land's agricultural potential to determine the extent, if any, to which agriculture can contribute to its future utilization (e.g., community food security).
	2. Klapmuts: a collaborative sub-regional growth management spatial framework between the Stellenbosch and Drakenstein Municipalities are required in order to avoid unsustainable twin developments.
	3. Simondium and Groot Drakenstein: A inter-municipal planning forum must be established to ensure that coordination exist between urban upgrade programmes and the management of non-urban land between the two settlements.
	4. Zewenwacht/ Bottelary Hills/ Haasendal area: Cross border urban growth management collaboration is required jointly by CoCT and the Stellenbosch Municipality to ensure maintaining the visual, natural and agricultural integrity of the Bottelary Hills.
	5. Faure Hills/Firgrove: a collaborative urban edge/municipal boundary assessment jointly undertaken by CoCT and Stellenbosch Municipality is required to "soften" the CoCT urban edge, especially where such edge coincides with the municipal boundary and directly abuts the vineyards. This would serve to lessen the threat to the adjacent viticulture areas and address the misperception of developers regarding extending the urban edge within the Faure Hills to benefit its locational advantages.
	6. Helderberg rural Interface: ensuring the integrity of heritage and agricultural working landscapes that comprise the Stellenbosch-Helderberg rural interface requires a joint CoCT-Stellenbosch Municipality collaborative planning forum to achieve synergy between the disparate settlement policies.
PRIORITY:	HIGH
INDICATORS	1. Has a collaborative sub regional growth management spatial framework been compiled between Stellenbosch and Drakenstein Municipalities for Klapmuts
	2. Has an inter-municipal planning forum been established between Stellenbosch and Drakenstein Municipalities to ensure that growth management (rural and urban) between Simondium and Groot Drakenstein is coordinated?
	3. Has Stellenbosch Municipality and the City of Cape Town established a formal joint platform to discuss development pressures on municipal boundaries?
	4. Has an urban edge assessment been done on the boundary of Stellenbosch Municipality and the CoCT to determine areas of spill over and potential conflict with policies?

4. BIODIVERSITY AND ECOSYSTEM SERVICES

4.1 BIODIVERSITY

The Cape Winelands District Municipality (CWDM) lies within one of the world's greatest biodiversity hotspots, the Cape Floristic Region (CFR) now known as the Core Cape Sub-Region (CCR), and includes parts of the Fynbos, Succulent Karoo, Albany Thicket and Afro-temperate Forest biomes[1]. The Fynbos and Succulent Karoo biomes have exceptionally high levels of plant diversity and endemism (species that occur only in a specific area and nowhere else). The CCR contains around 9383 vascular plant species with an endemism rate of just over 68%[1].

The high species diversity along with the range restriction of many species makes the CCR especially vulnerable. Of the 2577 taxa threatened nationally, 71% are located in the Western Cape[1]. They are predominantly from low-lying areas where agriculture and urbanisation has had the biggest Impact. Fynbos habitat loss is rated to be just over 30%. In the Fynbos biome 3087 taxa are of conservation concern with 1736 in danger of extinction[1]. 34% of taxa of conservation concern are due agricultural crops and 27% due to urbanisation and infrastructure developments. A further 20% of taxa are affected by invasive alien species. *Pinus* and *Hakea* species are affecting many mountain flora, a particularly important aspect for the CWDM which contains many mountainous areas.

Fire plays an important role in the health and maintenance of biodiversity in Fynbos. Many flower species have evolved to appear after fires and are then succeeded over the years by longer lived shrubs[1]. The composition of species is thus affected by the fire interval and the season in which a fire occurs. Increased fire frequency poses an especially big risk to slow growing alpine species and serotinous taxa. Those areas close to human settlements and roads are most at risk.

The Succulent Karoo boasts more than 5000 species with more than 50% of plant species endemic to the biome[2]. However, only around 5,8% of the biome is formally protected[3].

Being situated in such a unique area, the CWDM and local municipalities have a responsibility to aid in the protection of the CCR for present and future generations both locally and from around the world as it has such great value.

Development decisions should consider the Western Cape Biodiversity Spatial Plan and its accompanying handbook. Developments should especially avoid impacting on Critical Biodiversity Areas and Ecological Support Areas:

Critical Biodiversity Areas (CBAs): Areas that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure. These include:

- All areas required to meet biodiversity pattern (e.g., species, ecosystems) targets;
- Critically Endangered (CR) ecosystems (terrestrial, wetland and river types);
- All areas required to meet ecological infrastructure targets, which are aimed at ensuring the continued existence and functioning of ecosystems and delivery of essential ecosystem services; and
- Critical corridors to maintain landscape connectivity.

CBAs are areas of high biodiversity and ecological value and need to be kept in a natural or near-natural state, with no further loss of habitat or species. Degraded areas should be rehabilitated to natural or near-natural condition. Only low-impact, biodiversity-sensitive land uses are appropriate. In the maps, a distinction is made between CBAs that are likely to be in a natural condition (CBA 1) and those that are potentially degraded or represent secondary vegetation (CBA 2). This distinction is based on best available land cover data but may not be an accurate or current reflection of condition.

Ecological Support Areas (ESAs): Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs and are often vital for delivering ecosystem services. They support landscape connectivity, encompass the ecological infrastructure from which ecosystem goods and services flow, and strengthen resilience to climate change. They include features such as regional climate adaptation corridors, water source and recharge areas, riparian habitat surrounding rivers or wetlands, and Endangered vegetation.

ESAs need to be maintained in at least a functional and often natural state, in order to support the purpose for which they were identified, but some limited habitat loss may be acceptable. A greater range of land uses over wider areas is appropriate, subject to an authorisation process that ensures the underlying biodiversity objectives and ecological functioning are not compromised. Cumulative impacts should also be explicitly considered.

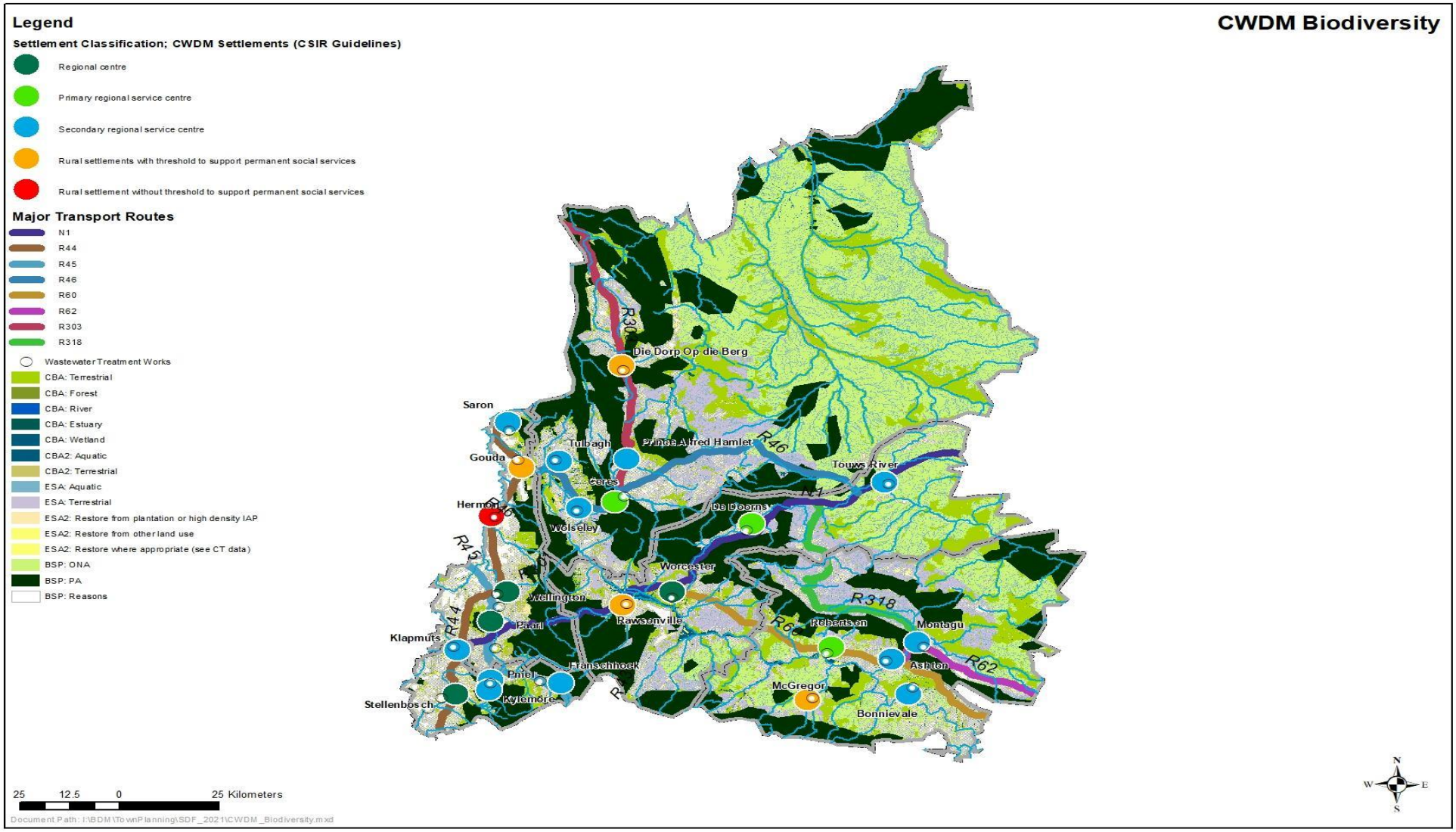
In the maps, a distinction is made between ESAs that are still likely to be functional (i.e., in a natural, near-natural or moderately degraded condition; ESA 1), and Ecological Support Areas that are severely degraded or have no natural cover remaining and therefore require restoration (ESA 2).

Other Natural Areas (ONAs): Areas that have not been identified as a priority in the current biodiversity spatial plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for meeting biodiversity targets, they are still an important part of the natural ecosystem.

ONAs should be managed or utilised in a manner that minimises habitat and species loss and ensures ecosystem functionality through strategic landscape planning. These 'other natural areas' offer considerable flexibility in terms of management objectives and permissible land uses, but some authorisation may still be required for high impact land uses.

Severely Modified to No Natural Remaining (NNR): Areas that have been modified by human activity to the extent that they are no longer natural, and do not contribute to biodiversity targets. These areas may still provide

limited biodiversity and ecological infrastructure functions, even if they are never prioritised for conservation action. These areas offer the most flexibility for land use, but these should be managed in a biodiversity-sensitive manner, aiming to maximise ecological functionality. Authorisation is still required for high-impact land uses.



Map27: Critical Biodiveristy Areas

4.2 ECOSYSTEM SERVICES

Ecosystem services are the benefits humans get from ecosystems. These are grouped into four main categories: Provisioning (e.g., production of food and water), regulating (e.g. Control of climate and disease), supporting (e.g. Nutrient cycling and crop pollination) and cultural (e.g. Spiritual and recreational activities).

Sustainable cities are only possible through healthy ecosystems and incorporating ecosystem services into planning and development can lead to significant municipal savings, boost local economy and improve the quality of life for residents[4]. Maintaining ecosystem services is the most affordable approach to meeting people's needs[4].

The lack of understanding by policy makers of the economic value of fynbos ecosystems is often what leads to a lack of funding for environmental management[5]. This clearly demonstrates the need for local municipalities to evaluate the economic value of the ecosystems services in their area to facilitate funding. A 1997 study, taking into account water production, wildflower harvesting, hiker visitation, ecotourism visitation, endemic species and genetic storage, estimated the value of a 4km^2 area fynbos between R19 mil and R300 mil depending on the valuation and management methods (1USD = 4.50ZAR)[5].

The ICLEI TEEB Manual for Cities suggest the following steps to incorporate ecosystem services into urban management:

1. Specify and agree on the problem or policy issue with stakeholders
2. Identify which ecosystem services are most relevant
3. Determine what information is needed and select assessment methods
4. Assess (future changes in) ecosystem services
5. Identify and assess management/policy options
6. Assess the impact of the policy options on the range of stakeholders

Steps should be taken to ensure the protection of freshwater ecosystems due to the arid nature of the CWD and the Western Cape in general. Initiatives should be undertaken to clear alien species, restore/protect riparian zones and wetlands, and implement farming best practices, to maximise the amount of available water, its quality and maintain the flood regulating benefits gained from healthy freshwater ecosystems.

4.3 INVASIVE ALIEN SPECIES

Invasive alien plants are having a serious impact, not only on our biodiversity, but also on the ecosystem services provided by fynbos, especially relating to water provisioning. Invasive plants significantly increase the biomass and transpiration in water catchment areas reducing runoff and streamflow, meaning less water for the population. Reductions between 30 and 100 percent have been estimated for downstream yield due to alien species[5,6]. Furthermore, the increased fuel load created by alien plant infestations has increased fire frequency, a subsequent rise in surface water runoff and top soil erosion[6].

Invasive species are likely to have significant impacts on pollination, water purification, pest control, natural hazards and climate mitigation services

obtained from ecosystems. They can narrow waterways and decrease water retaining capacity, thereby increasing flood risk[6].

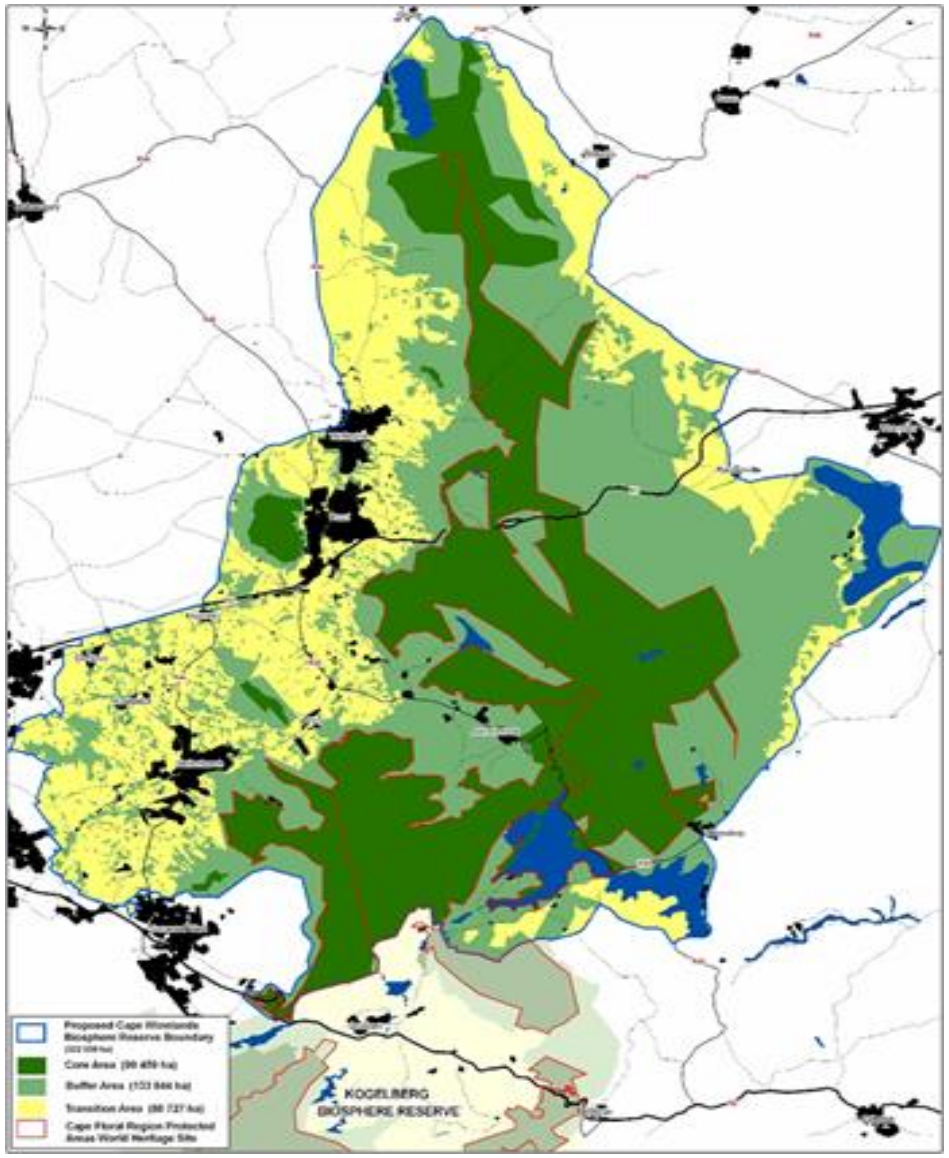
Furthermore, invasive species can have detrimental effects on human wellbeing[7]. However, conflict can arise between those aiming to remove the invasive species and rural/poor communities who rely on the invasive populations for fuel and building material.

It has been demonstrated that invasive species can reduce the value of fynbos ecosystems by over US$11,75 million[7].

Please refer to annexure 4, Cape Winelands District Municipal Alien Clearing Coordination Framework.

4.4 CAPE WINELANDS BIOSPHERE RESERVE

The Cape Winelands Biosphere Reserve (CWBR) was designated by UNESCO in accordance with the Man and the Biosphere (MAB) Programme in September 2007. It covers an area of 322 030 ha. It is stated the CWBR would support the development of the Cape Winelands as "an area of excellence and good practice for people, culture and nature". The main purpose of the CWBR therefore is to promote biodiversity, sustainable development and education. It shares a border with the Kogelberg Biosphere Reserve in the south and covers an area northward along the Cape Fold Mountains and valleys of the Cape Winelands. It covers the Stellenbosch local Municipality and parts of the Breede Valley, Witzenberg and Theewaterskloof local municipalities (Map 30). It consists of three regions: the core (pristine area where no intrusive development is allowed), buffer zone (protects the core) and transition zone (sustainable land use practices are supported). Core areas are made up of wilderness areas, statutory protected areas, Critical Biodiversity Areas (CBA), Ecological Support Areas (ESAs), rivers and ecological corridors. Sections of the core area also form part of the extensive Cape Floral Region Protected Areas World Heritage Site. This was a serial nomination, and the site was inscribed on the World Heritage List in 2004. It is made up of eight protected areas of which the Boland Mountain Complex includes, inter alia, the Hottentots Holland, Jonkershoek and Limietberg Nature Reserves, all of which form part of the CWBR core areas. The buffer areas are found next to core areas and are intended to reduce the impact of human activities on core areas as well as link core areas by creating biodiversity corridors. They mostly consist of natural and near-natural land which is not formally conserved in accordance with the Protected Areas Act and could include private nature reserves and other conservation areas. Transitional areas allow for a variety of land uses, including intensive agriculture as well as urbanisation.



Map 28: Cape Winelands Biosphere Reserve

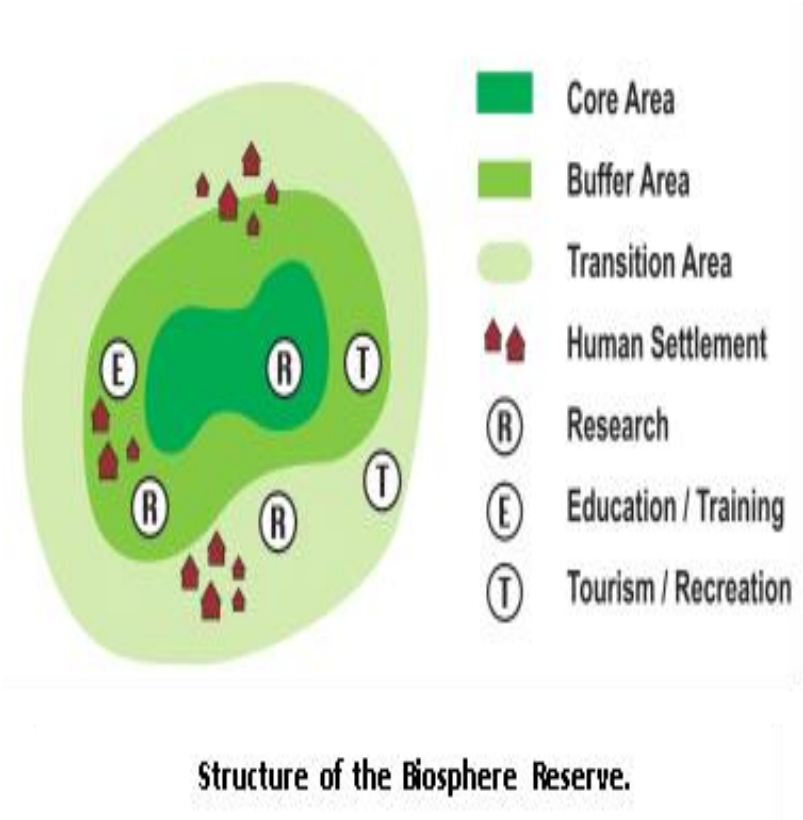


Figure 1: Structure of a Biosphere Reserve.

4.5 Key findings: Biodiversity and Ecosystem Services

4.5.1 Habitat loss.

4.5.2 Change in fire regime.

4.5.3 Invasive Alien Species.

4.5.4 Urban and agricultural development.

4.5.5 Over extraction of water sources.

4.5.6 Loss of ecosystem services.

4.5.7 River health/Lack of protection of freshwater ecosystems.

4.5.8 Integrate ecosystem services into planning and development.

4.5.9 Degradation of wetlands.

4.5.10 Stake holder disagreements relating to alien clearing.

4.5.11 Largely unknown economic value of ecosystem services.

4.6 Implementation proposals:

RESPONSIBILITY:	FOCUS AREA: BIODIVERSITY AND ECOSYSTEM SERVICES
CWDM, Category B Municipalities, DoA & PGWC, DEADP	1. Prevent the loss and degradation of Critical Biodiversity Areas (CBAs) and Ecosystem Support Areas (ESAs); incorporate CBAs into protected area networks. 2. Restore CBAs and ESAs where appropriate to maintain ecosystem services and protect biodiversity. 3. No further loss of wetlands; increase protection of freshwater ecosystems. 4. Ensure adequate buffer areas around wetlands and Core Areas. 5. Remove invasive alien species. 6. Maintain buffer areas of the Cape Winelands Biosphere Reserve to protect Core Areas and maintain the integrity of the reserve. 7. Ensure developments follow required processes and assessments and adhere to requirements of this document, the Western Cape Biodiversity Spatial Plan, the Cape Winelands Biosphere Reserve and other relevant SDFs and documents. 8. Promote conservation agriculture. 9. Improve and maintain ecological corridors across farms to facilitate the migration of flora and fauna.

	10. Discourage the introduction of exotic species as outlined in the Biodiversity Act. 11. Minimise factors that impact on pattern and process integrity in Core Areas, CBAs and ESAs. 12. Encourage environmental education and non-consumptive low impact eco-tourism. 13. Harvest natural resources sustainably. 14. River bank development should be set back behind the ecological setback lines including flood and storm surge lines (1:50 year flood line: property boundaries; 1:100 years flood line: building platform).
TOOLS AND RESOURCES:	15. Cape Farm mapper: https://gis.elsenburg.com/apps/cfm/ 16. Western Cape Biodiversity Spatial Plan 2017: http://bgis.sanbi.org/Projects/Detail/194 17. Cape Winelands Biosphere Reserve: http://capewinelandsbiosphere.co.za/
PRIORITY:	High

4.7 CWDM Implementation Plan: Biodiversity Conservation

PROJECT/ACTIVITY:	BUDGET:	RESPONSIBLE DIVISION:	DURATION:	IDP, SERVICE DELIVERY BUSINESS IMPLEMENTATION PLAN (SDBIP) STRATEGIC OBJECTIVE (SO) REFERENCE:
EPWP Invasive Alien Vegetation Management	R 2 030 000, 00	Spatial Planning and Environmental Management	Annually	SO 1; 1.4
River Rehabilitation	R 100 000, 00	Spatial Planning and Environmental Management	Annually	SO 1; 1.4
Service Delivery Agreement with Cape Winelands Biosphere Reserve	R150 000, 00	Spatial Planning and Environmental Management	Annually	Section 17.3.J [Grants advertised through IDP/Budget process]

5. CLIMATE CHANGE

5.1 RAIN AND TEMPERATURE

Although there are variations between models, some predictions of future climate patterns are more certain. Climate models indicate hotter and dryer conditions in the Western Cape in the mid future (2046 to 2065)[1–5]. In the CWDM we can expect a decrease in mean annual rainfall and the number of days with a rainfall above 5mm,10mm and 20mm[1]. Furthermore, there is a chance of a slight increase in the number of days with no rain in the CWDM[1]. Even though, the mean annual rainfall will likely decrease, it is possible that we may experience an increase in rainfall intensity. This would increase flooding risks.

Despite evidence of a drier future for the WC and CWDM, there are also predictions of increased rain over the mountains, and so in spite of predictions of a drier future it is important that planning takes into account the possibility of a wetter future[6]. However, since a drier future is of higher concern planning should prioritize preparing for it. There are also possibilities of rainfall shifting into autumn and spring[6].

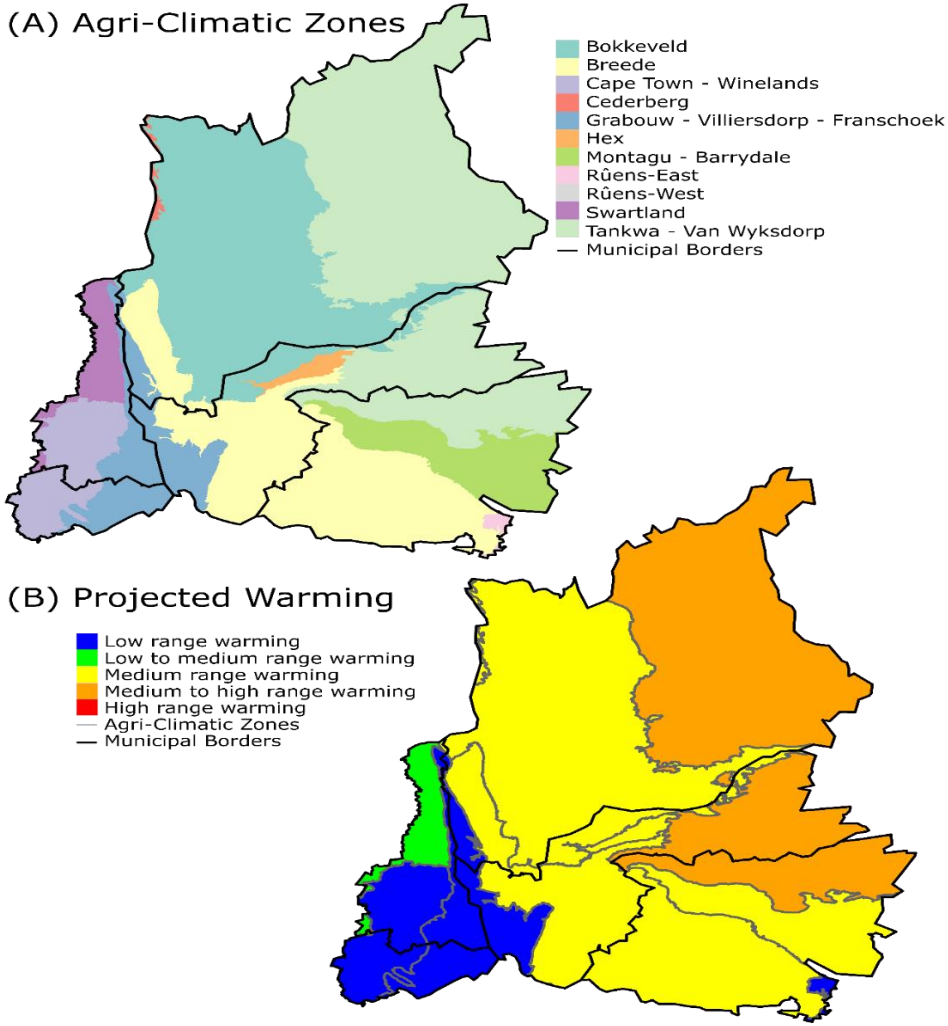
Streamflow is predicted to decrease in the future, with future demand for water to exceed the supply due to climate change[7,8]. A reduction in streamflow is predicted for the Breede River, to the point where it may drop below the ecological requirement[8]. The Breede River is an important water source during the summer months, and so a reduction in streamflow is of great concern.

Temperatures are predicted to increase by 1.5˚C to 3˚C across the Western Cape[9]. In the CWDM, local municipalities covering, and to the southwest of the Boland Mountains, will experience low levels of warming (Fig). This includes Stellenbosch and Drakenstein municipalities as well as small parts of the Witzenberg and Breede Valley municipalities (Fig 4.1). However, the Langeberg Municipality and the majority of the Witzenberg and Breede Valley municipalities will experience medium to high warming (Map 32 (B)).

5.1.1 Agriculture

Due to the combination of decreased rainfall and increased temperatures, agricultural crops and livestock will experience increased heat and water stress. Increased evapotranspiration could lead to crops experiencing drought conditions even when rains have been good[5].

The total agricultural potential of the CWDM remains high as long as dams fill up in the future [6]. To the Southwest of the CWDM irrigation is extensive and due to the existing infrastructure, these producers are well positioned to deal with lower rainfall. However, the Tankwa-van Wyksdorp agro climatic region to the Northeast of the CWDM will experience a slow decline in productivity due to increased temperatures and decreased water availability[6].



Map 29: Agri-climatic zones (A) and projected warming for the Cape Winelands District (B). Data: Western Cape Department of Agriculture.

Increased reliance on irrigation would place even further stress on our water resources. Although, planting drought resistant crops or varieties could mitigate the reliance on irrigation.

Additionally, warming will have a significant impact on Daily Positive Chill Units (DPCU). In warmer areas, an increase in as little as 1˚C will severely affect apples, while an increase of 2˚C will cause all years to not reach the required 800DPCU target for current cultivars[10]. Cooler areas (Koue bokkeveld) will be able to absorb an increase of up to 2˚C, and still exceed 800DPCU.

Similarly, wine vineyards in the hotter areas are most at risk while those in cooler areas such as southern mountain slopes will have some buffering. Cultivars that are most at risk include Shiraz, Merlot, Sauvignon Blanc and Chardonnay[11]. Although there is differing views of the total impact on wine grape production, there is concern that vineyards may move higher up mountains into cooler regions causing conflict with conservation goals[11].

Of great concern is the water quality in the Lower Berg River. Irrigation water not complying with standards for export, could lead to serious economic impacts. Further impacts from climate change could include smaller fruit, changes in pest and disease levels, fruit colour, seasonal shifts and insufficient ground water recharge among others[10,12]. Because the relationship between climate change and agriculture is so complex, it's important that decision makers and planners make use of the resources provided by the SmartAgri project and consult experts since each crop and cultivar may require a different response.

Export markets are changing in response to climate change, with importers aiming to become carbon neutral by reducing "food miles". Most of the pressure to reduce their footprint is put on suppliers[6]. However, the main driver for this change is still profit. Local producers and suppliers can take advantage of this "green" market by supplying and producing "green" products.

Conservation agriculture (CA) has great potential to reduce greenhouse gas emissions (GHG) emissions from the agricultural sector and to improve food security. Reports of improved soil fertility, yields, water retention and a decrease in water and wind erosion have emanated from the practice of CA. A look into the effect of CA on wheat production showed that a no-till approach reduced diesel consumption by at least 60% compared to traditional methods.

The major sources of GHG emissions in the agricultural sector are electricity, due to the large-scale use of coal power stations, and diesel consumption. It is estimated that at a farming level, 70% of GHG emissions are from electricity consumption and 13% from diesel consumption for fruit and wine farms.

Table 25: Impact of climate change on agro-climatic zones of the CWDM (Source: Midgeley et al, 2016)

Agro-climatic zone	Municipalities	Crops	Agricultural Potential (2040-2060)
Cape Town-Winelands	Stellenbosch, Drakenstein Municipalities	Wine and table grapes, wheat, stone fruit, vegetables, olives, canola, berries, Broilers, egg layers, pigs	Remains high as long as dams fill up
Swartland	Stellenbosch, Drakenstein Municipalities	Wheat, wine and table grapes, canola, lovies, dairy, pigs, sheep, cattle	Remains high for small grains but with increasing yield variability
Grabouw-Villiersdorp-Franschhoek	Stellenbosch, Drakenstein, Breede Valley and Witzenberg Municipalities	Pome fruit, wine grapes, wheat, barley, stone fruit, berries	Remains high as long as dams fill up
Breede	Langeberg, Breede Valley and Witzenberg Municipalities	Wine grapes, wheat, stone fruit, pome fruit, olives, Broilers, egg layers	Remains high as long as dams fill up
Hex	Breede Valley Municipality	Table grapes, citrus	Remains high as long as dams fill up
Montagu-Barrydale	Langeberg Municipality	Stone fruit, wheat, barley, wine grapes, pome fruit, citrus, olives, sheep	Remains high as long as dams fill up
Tankwa-Van Wyksdorp	Langeberg, Breede Valley, Witzenberg Municipalities	Wheat, stone fruit, wine grapes, sheep, goats, pigs, cattle, game, ostrich, dairy	Slowly declining productivity constrained by heat and water availability
Bokkeveld	Breede Valley, Witzenberg Municipalities	Pome fruit, wheat, stone fruit, onions, potatoes, cattle	Remains high as long as dams fill up
Ruens-east	Langeberg Municipality	Wheat, barley, canola, sheep, cattle, dairy, pigs, ostrich	Currently becoming marginal for small grains but could improve given possible increases in rainfall

5.1.2 Biodiversity and Ecosystem Services

Biodiversity and intact ecosystem services will be vitally important for adaptation to climate change. "Soft" approaches, such as using intact wetlands for flood control, may be more effective and cost less than "hard", engineered approaches, such as building dams[13]. Linking biodiversity, development and social goals are thus important to adapting to climate change and building a sustainable future.

It has been estimated that climate change may lead to the extinction of 21% to40% of Protea species[14]. This is largely driven by the loss of suitable habitat range, especially the loss of suitable ranges within protected areas as ranges shift due to climate change[15]. It follows that corridors should be created to facilitate the movement of species in response to climate change. It is furthermore paramount that critical biodiversity and ecological support areas are conserved.

Fire will play a significant role in shaping biodiversity in the future. They are likely to increase in both frequency and intensity. Shorter fire intervals will decrease population viability compared to longer fire intervals[16]. Hence, fire management will play an important role in mitigating the impact on biodiversity.

Hannah et al. (2007) found that taking into account both current and future conservation goals simultaneously, can significantly reduce the area needed to attain conservation goals and so in turn the costs[17]. Consequently, it is recommended that environmental/conservation planners consider not only current conservation goals but also those of the future simultaneously.

*This does not account for land use change in the future, which will also be strongly affected by climate change

5.1.3 Infrastructure

Changes in temperature and precipitation will also affect the speed at which infrastructure decays and the amount of maintenance required to keep buildings and roads up to standard.

Higher temperatures will increase the rate at which new cracks form and reduce the expected lifetime of paved roads[18]. Increased bleeding, flushing and rutting may be expected on older or poorly constructed roads[18]. Increased rain intensity could cause erosion damage, especially to dirt roads, even though overall rainfall may decrease.

Costs incurred due to buildings is predicted to be of a much greater concern[19]. Most of the costs will be due to school buildings as they form the largest number of public buildings. However, of concern are the costs from hospitals, since this can be directly linked to health risks. Chinowsky et al (2012)[19] assumed in their analysis that costs due to damage to cladding and roofing would be minimal; thus costs are mainly attributed to heating, ventilation and air conditioning (HVAC) systems.

Early adaptation by upgrading roads and buildings may reduce the costs incurred by climate change in the long term. However, in some cases opportunity costs can be higher for the adaptation scenario than for the no adaptation scenario. Since data is lacking, especially at a district and local scale, it is important that studies are done to assess the impact for local municipalities to inform decision making.

5.1.4 Socio-economic

The poor and disadvantaged will be the most affected by climate change as they lack the resources to deal with the impacts. In the agricultural sector these include smallholder farmers, peri-urban farmers, new farmers and farm workers (especially seasonal and ad-hoc labourers)[6]. Attention should be given to women in these groups. They regularly face more obstacles as they are often the caretakers of the families and so are choice limited.

Climate extremes pose a significant threat to farm workers. Threats include among others heat stress, water borne diseases due to poor water quality, vector borne diseases and risks from fires[6]. Workers may also experience decreased productivity due to warming, worsened by food insecurity, hunger and malnutrition[6]. Climate change may also worsen existing health challenges related to HIV and TB.

Decreased agricultural production would lead to decreased employment.

It is predicted that urban-rural migration will form a large part of future urbanisation and suspected to be greatest in countries and regions most affected by climate change[20]. Increased urbanisation will place extra stress on cities to supply basic services to the increasing population. As subsistence farmers and small scale are likely to be hardest hit from climate change, and so migrate to cities, it will be important to introduce measures to help them adapt and allow them to continue to rely on natural resources for their livelihoods. However, curbing urbanisation is rarely successful and local governments should be prepared. Buhaug and Urdal(2013)[20] found that economic shock was one of the best predictors for social disorder and so local governments should likely focus more on mitigating the economic impacts of climate change than fight increased urbanisation due to climate change.

Adger et al. (2008)[21] argues that there are social limits to adaptation. These limits are affected by ethics (how and what we value), knowledge (how and what we know), risk (how and what we perceive) and culture (how and why we live). Social limits, however, are not constant and may be changed. Society's ability to adapt in a timely fashion is severely hampered by the interaction between individual and societal characteristics, and underlying values which form subjective yet changeable limits. Risk perceptions is a highly important characteristic, since individual adaptation affected by whether impacts, past or future, are perceived as a risk and should or could be acted on.

Nonetheless, community-based initiatives and activities can help individuals feel enabled and implement behavioural alternatives[21]. This suggests the importance for the continuation and implementation of education and community-based initiatives to be able to successfully adapt to climate change in the present and future. However, there is currently little indication of larger scale initiatives with equivalent outcomes.

5.2 Key findings: Climate Change

5.2.1 Increased dependence on irrigation due to warming and reduced rainfall.
5.2.2 Increased heat and water stress for citizens, animals and crops.
5.2.3 Increased flooding risk due to increased rainfall intensity.
5.2.4 Higher incidence of heat waves.
5.2.5 Increased fire risk – impacts agriculture, biodiversity and health.
5.2.6 Possible increase in prices of agricultural products due to reduced yields and/or increased farming costs.
5.2.7 Increased strain on ecosystem services.
5.2.8 Possible job losses due to impact on agriculture.
5.2.9 Potential reduction in agricultural exports due to decreased quality.
5.2.10 Loss of ecotourism due to biodiversity loss and degradation of natural environment.
5.2.11 Loss of biodiversity.
5.2.12 Loss of ecosystem services.
5.2.13 Increased food prices.
5.2.14 Loss of international export standards due to poor water quality in the Berg River.
5.2.15 Increased heat-island effect.

5.2.16 Social limits to adaptation.

5.3 Implementation proposals:

RESPONSIBILITY:	FOCUS AREA: CLIMATE CHANGE
CWDM, Category B Municipalities, DoA & PGWC, DEADP	1. Find ways to reduce water demand and investigate water efficient ways of expanding the agricultural economy 2. Clear alien invasive species 3. Protect riparian zones a. Allow for a buffer along riverbanks to protect the banks from flood damage b. No further development may be permitted on riverbanks that are prone to flooding and below the 1:50 year flood lines (erven) and the 1:100-year flood lines (building platforms) 4. Prevent the loss and degradation of Critical Biodiversity Areas (CBAs) and Ecosystem Support Areas (ESAs) 5. Restore CBAs and ESAs where appropriate to maintain ecosystem services and protect biodiversity 6. Prevent further loss and degradation of wetlands 7. Reduce greenhouse gas emissions 8. Ensure new developments to adhere to standards of high energy efficiency, low embedded carbon and good accessibility to public transport 9. Promote changes to existing developments that will increase the efficiency of energy use in power, heating and transport (e.g., insulation) 10. Promote land uses that serve as carbon sinks (e.g., community woodlands) 11. Encourage the development and use of renewable resources of energy, preferably local (e.g., solar, wind power, biomass etc.) 12. Reduce the amount of waste (particularly biodegradable waste), the volume sent to landfill and maximise capture and use of greenhouse gasses, particularly methane (e.g., waste minimisation, composting) 13. Guide new development to locations that best offer protection from likely impacts – including flooding and drought, sea level rise, storminess, soil subsidence and heave and implications for supply and demand of essential services (e.g., preference to locations that have sustainable existing water supply rather than those that require long distance supply) 14. Ensure that the design and layout of new developments (including buildings, open spaces and infrastructure) will be resilient or adaptable to the likely impacts during the development's lifetime (e.g., designing in flood protection and water saving features; orientation to take advantage of solar gain for PVs etc.) 15. Promote changes to existing development that will enhance its resilience or adaptability to likely impacts during its lifetime (e.g., improving site drainage, introducing grey water recycling etc.) 16. Increase in the length and width of ecological corridors in altitudinal, North-South and East-West directions

	17. The current area of each of the natural areas should not be reduced or fragmented 18. Institute measurable outcomes to track successes and failures (Area covered by invasive plants, carbon emissions etc.)
TOOLS AND RESOURCES:	19. Cape Farm mapper: https://gis.elsenburg.com/apps/cfm/ 20. Western Cape Biodiversity Spatial Plan 2017: http://bgis.sanbi.org/Projects/Detail/194 21. Cape Winelands Biosphere Reserve: http://capewinelandsbiosphere.co.za/
PRIORITY:	High

5.4 CWDM Implementation Plan: Climate Change

PROJECT/ACTIVITY:	BUDGET:	RESPONSIBLE DIVISION:	DURATION:	IDP, SERVICE DELIVERY BUSINESS IMPLEMENTATION PLAN (SDBIP) STRATEGIC OBJECTIVE (SO) REFERENCE:
EPWP Invasive Alien Vegetation Management	R 2 030 000, 00	Spatial Planning and Environmental Management	Annually	SO 1; 1.4
River Rehabilitation	R 100 000, 00	Spatial Planning and Environmental Management	Annually	SO 1; 1.4
Service Delivery Agreement with Cape Winelands Biosphere Reserve	R150 000, 00	Spatial Planning and Environmental Managment	Annually	Section 17.3.J [Grants advertised through IDP/Budget process]
Provision of Water to Schools (Water Tanks)	R400 000, 00	Projects and Housing	Annually	SO 2; 2.2
Infrastructure Rural Area Farmers (Renewable energy)	R1000 000, 00	Projects and Housing Section	Annually	SO 2; 2.2
Subsidy: Water/sanitation-Farms	R1000 000, 00	Municipal Health Services	Annually	SO 1; 1.1

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Approved