



**Western Cape
Government**

Department of Environmental Affairs and
Development Planning

Western Cape Integrated Waste Management Plan 2022-2027 (Draft)

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ACRONYMS

2W2W	2Wise2Waste
C&D	Construction and Demolition
CAPEX	Capital Expenditure
CBO	Community-based Organisation
CCT	City of Cape Town
CITP	Comprehensive Integrated Transport Plan
CKDM	Central Karoo District Municipality
COGTA	National Department of Cooperative Governance and Traditional Affairs
CSIR	Council for Scientific and Industrial Research
CWDM	Cape Winelands District Municipality
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DEDAT	Department of Economic Development and Tourism
DFFE	Department of Forestry, Fisheries and the Environment
DM	District Municipality
DoLG	Department of Local Government
DoRA	Division of Revenue Act
DST	Department of Science and Technology
DTI	Department of Trade and Industry
DTPW	Department of Transport and Public Works
e-Waste	Electronic Waste
EPR	Extended Producer Responsibility
eWASA	e-Waste Association of South Africa
GDP	Gross Domestic Product
GDPR	Gross Domestic Product per Region
GESF	Green Economy Strategic Framework
GHS	Globally Harmonised System of Classification and Labelling of Chemicals
GPS	Growth Potential Study of Town
GRDM	Garden Route District Municipality
HCRW	Health Care Risk Waste
ICT	Information and Communications Technology
IDP	Integrated Development Plan
IDZ	Industrial Development Zone
IITWMP	Integrated Industry Waste Tyre Management Plan
IPWIS	Integrated Pollutant and Waste Information System
IWEX	Integrated Waste Exchange
IWMOF	Western Cape Integrated Waste Management Officer's Forum
ISWM	Integrated Sustainable Waste Management
IWMP	Integrated Waste Management Plan
Kg/c/day	Waste generation per capita per day
LG MTEC	Local Government Medium Term Expenditure Committee
LM	Local Municipality
MEC	Member of the Executive Council
MERO	Municipal Economic Review and Outlook
MIG	Municipal Infrastructure Grant
MINMEC	Minister of Environmental Affairs and members of Provincial Executive Councils
MINTECH	Director-General of Environmental Affairs and Heads of Provincial Departments

MIS	Management Information System
MRF	Materials Recovery Facility
MSA	Municipal Systems Act
MTSF	Medium Term Strategic Framework
NCPC- SA	National Cleaner Production Centre of South Africa
NDP	National Development Plan
NEMA	National Environmental Management Act, 107 of 1998
NEM:WA	National Environmental Management: Waste Act, 59 of 2008
NEM:WAA	National Environmental Management: Waste Amendment Act, 26 of 2014
NGO	Non-governmental organisation
NPSWM	National Pricing Strategy for Waste Management
NWMS	National Waste Management Strategy
ODM	Overberg District Municipality
OPEX	Operational Expenditure
PERO	Provincial Economic Review and Outlook
POPs	Persistent Organic Pollutants
PSDF	Provincial Spatial Development Framework
PSP	Provincial Strategic Plan
S@S	Separation at Source
SAEWA	South African E-Waste Alliance
SANS	South African National Standards
SAWIS	South African Waste Information System
SDF	Spatial Development Framework
SDGs	Sustainable Development Goals
SDBIP	Service Delivery Budget Implementation Plan
SMME	Small, Medium and Micro Enterprise Businesses
Stats SA	Statistics South Africa
WCDM	West Coast District Municipality
WCG	Western Cape Government
WCIF	Western Cape Infrastructure Framework
WCMR	Waste Classification and Management Regulations
WCRAAG	Western Cape Recycling Action Group
WDF	Waste Disposal Facility
WEEE	Waste Electric and Electronic Equipment
WISP	Western Cape Industrial Symbiosis Programme
WMF	Waste Management Facility
WML	Waste Management Licence
WMO	Waste Management Officer

GLOSSARY

TERMS	DEFINITION
Buy back centre	The place that allows residents, informal reclaimers and/or entrepreneurs to sell recyclables.
Circular economy	An economy that is restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times, distinguishing between technical and biological cycles. This new economic model seeks to ultimately decouple global economic development from finite resource consumption. It enables key policy objectives such as generating economic growth, creating jobs, and reducing environmental impacts, including carbon emissions (DEFF, 2020).
Disposal	Means the burial, deposal, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land (NEM:WA, 2008)
Drop-off facility	Facilities that provide residents with the convenient opportunity to dispose of waste, which they have not put out for collection, into containers for later removal by the municipality.
Extended Producer Responsibility	Means that a producer's responsibility for an identified product is extended to the post-consumer stage of an identified product's life cycle.
Free basic services	<p>Free basic service is defined as the minimum amount of basic levels of services, provided on a day-to-day basis, sufficient to cover or cater for the basic needs of poor households. Various sector departments have set minimum standards outlining the basic amount of services or quantity to be supplied to the indigents concerning water, energy, sanitation and refuse removal.</p> <p>Free basic refuse removal levels of services/standards include:</p> <ul style="list-style-type: none"> (a) on-site appropriate and regularly supervised disposals; (b) community transfer to central collection points; (c) organised transfer to central collection points and/or kerbside collection (in high density settlements); or (d) a combination of methods above
General waste	<p>Waste that does not pose an immediate hazard or threat to health or to the environment, and includes:</p> <ul style="list-style-type: none"> (a) domestic waste; (b) building and demolition waste; (c) business waste; (d) inert waste; or (e) any waste classified as non-hazardous waste in terms of the regulations made under section 69 of the Waste Act (59 of 2008), and includes non-hazardous substances, materials or objects within the business, domestic, inert or building and demolition wastes.

Hazardous waste	Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.
Indigent	The term 'indigent' means 'lacking the necessities of life'. In a South African context, the Constitution provides a guide in this regard, leading to the view that the following goods and services are considered as necessities for an individual to survive: a) sufficient water b) basic sanitation c) refuse removal in denser settlements d) environmental health e) basic energy f) health care g) housing h) food and clothing Anyone who does not have access to these goods and services is considered indigent.
Integrated Waste Management	Employing several waste control and disposal methods, i.e. reducing, re-using, recycling, incinerating, and landfilling, to minimise the environmental impact of commercial and industrial waste streams.
Integrated Waste Management Plan	A plan prepared in terms of section 12 of the Waste Act (59 of 2008).
Materials recovery facility	A centre for the reception and transfer of materials recovered from the waste stream for recycling. Materials are sorted by type and treated.
Minimisation	The avoidance of the amount and toxicity of waste that is generated and, in the event, where the waste is generated, the reduction of the amount and toxicity of waste that is disposed (NEM:WA, 2008).
Municipal Solid Waste	Waste generated from residential and non-industrial commercial sources. It includes predominantly household waste (domestic waste) with sometimes the addition of commercial waste collected by a municipality within a given area. It includes either solid or semi-solid wastes and generally excludes industrial hazardous waste.
Polluter Pays Principle	All costs associated with waste management should, where possible, be borne by the waste generator.
Re-use	To utilise the whole, a portion of a specific part of any substance, material or object from the waste stream for a similar or different purpose without changing the form or properties of such substance, material or object. (NEM:WAA, 2014).
Regional Gross Domestic Product (GDPR)	GDPR at market prices equals the sum of gross value added by all industries at basic prices plus taxes on products minus subsidies on products in a region.
Recovery	The controlled extraction of material or the retrieval of any substance, material or object from waste (NEM:WAA, 2014).

Recycle	A process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material (NEM:WA, 2008).
Refurbishment	The repair and reconditioning of products so that they can be returned to use for another life cycle. Refurbishment may be performed by the original manufacturer, or a third party qualified to perform the necessary parts replacement or repairs (DEFF, 2020).
Separation at source (s@s)	Separation at source is the separation of different types of post-consumer waste materials at the site where they are generated. S@S typically focuses on the separation of recyclables (and often further disaggregation into different types of recyclables), organic waste and solid waste. Selective collection of separated materials ensures that they do not contaminate each other and that waste to landfill is minimised.
Sustainable development	Sustainable development reflects a process that meets the needs of the present without compromising the ability of future generations to meet their own needs. Often called intergenerational equality, the idea is that we should share natural resources not just with people who are alive on the planet today but also with future generations of the Earth's inhabitants. While we can use a certain amount of the planet's resources, we should never entirely deplete a natural resource. Sustainable development requires people to rely as much as possible on renewable resources (the kind that can be replenished) by getting power from the sun rather than power from fossil fuels such as oil, coal, and natural gas, which take millions of years to form. Besides the careful stewardship of natural resources, sustainable development promotes the eradication of poverty and extreme income and wealth inequalities, the goal of full employment, the provision of access to quality and affordable basic services to all South Africans, and the fostering of a stable, safe and just society.
Swop shop	This refers to an exchange of recyclable material for goods that are basic needs. The material is valued through a point system, which can be redeemed for goods.
Transfer Station	A facility that receives solid waste from collection vehicles and reloads that waste into larger vehicles for transfer to a disposal processing facility.
Treatment	Means any method, technique or process that is designed to: <ul style="list-style-type: none"> (i) change the physical, biological or chemical character or composition of a waste or, (ii) remove, separate, concentrate or recover a hazardous or toxic component of a waste, or (iii) destroy or reduce the toxicity of waste, in order to minimise the impact of the waste on the environment prior to further use or disposal.
User Pays Principle	All costs associated with the use of a resource should be included in the price of goods and services developed from that resource.

Waste	Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, by the holder of the substance, material or object, whether or not such substance, material or object can be reused, recycled or recovered. NEM:WAA (Act No. 26 of 2014). Once it is re-used, recycled or recovered the material ceases to be a waste
Waste Disposal Facility (Landfill site)	Means any site or premises used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premises (NEM:WA, 2008)..
Waste Management Facility	A place, infrastructure, structure or containment of any kind, upon or at, a waste management activity takes place and includes a waste transfer station, container yard, landfill site, incinerator, a lagoon, recycling or a composting facility (NEM:WA, 2008).
Waste Management Hierarchy	The "hierarchy of waste management" is a priority sequence for managing waste, the most desirable option being to avoid waste in the first place. Where it is not possible to avoid waste completely, ways to reduce, re-use or recycle the unwanted material should be considered. If waste cannot be made useful, only then should it be collected, treated and disposed of (DEFF, 2020).
Waste Management Officer	Means a waste management officer designated in terms of section 10 of the Waste Act (NEM:WA, 2008).
Waste picker	Someone who collects re-usable and recyclable materials from residential and commercial waste bins, landfill sites and open spaces in order to revalue them and generate an income. (DEFF & DST, 2020).
Waste picker integration	The creation of a formally planned recycling system that values and improves the present role of waste pickers, builds on the strengths of their existing system for collecting and revaluing materials, and includes waste pickers as key partners in its design, implementation, evaluation and revision. Waste picker integration requires changes in a number of spheres and includes the integration of waste pickers' work, as well as the political, economic, social, legal and environmental integration of waste pickers (DEFF & DST, 2020).
Waste Transfer Facility	A facility that is used to accumulate and temporarily store waste before it is transported to a recycling, treatment or waste disposal facility.

EXECUTIVE SUMMARY

The National Environmental Management: Waste Act 59 of 2008, as amended (NEM: WA) requires that provincial governments and municipalities develop Integrated Waste Management Plans (IWMPs) to ensure proper waste management planning. The 3rd generation Western Cape IWMP for 2022-2027 (WC IWMP) aims to provide strategic direction for waste management in the Province over the short, medium and long-term.

The specific objectives of the WC IWMP are:

- to provide an analysis of the status of implementation of the 2nd generation IWMP 2017-2022;
- to provide an overview of the achievements in the province in terms of waste management;
- to provide an overview of the identified waste management gaps and needs in the province;
- to develop a set of goals, objectives, activities and targets that respond to the identified gaps and needs; and
- to take cognisance of aspects relating to gender equality, human rights, socio-economic development, sustainability of waste services, environmental impacts when developing goals, objectives, activities and targets.

The WC IWMP aligns with the global Sustainable Development Goals, and various key national and provincial policies. The WC IWMP specifically aligns with the National Waste Management Strategy, 2020, which promotes the waste management hierarchy and circular economy. The WC IWMP highlights waste management linkages and cross-cutting issues such as climate change, sustainable consumption and production, job creation and poverty reduction, and health and environmental impacts. A separate Gender Gap Analysis was undertaken, which identified the linkages between waste management and gender and human rights.

To obtain an understanding of the status quo of waste management situation in the province, a Situational Analysis was undertaken, which included an overview of demographic, economic and waste management aspects.

- **Socio-economic profile**
The Western Cape accounts for 12% (49% males and 51 % females) of the estimated South African total population of 59.62 million (StatsSA, 2020). The province has a larger proportion of the elderly (6.8%) compared to the national average (6.1%) but has a smaller proportion of children (24.4% provincially compared to 29.6% nationally) (Provincial Treasury, 2020). The bulk (65.7%) of the province's population resides in the CoCT (Provincial Treasury, 2021). This translates to a higher demand for services, including waste removal. During the first quarter of 2020, the Western Cape had a narrow unemployment rate of 20.9% and an expanded unemployment rate of 24.8% (Provincial Treasury, 2020). Household income declined by 0.25% on average between 2015 to 2019 with an average annual household income growth of 1.4% that slowed to 1% (Provincial Treasury, 2020).

- **Service levels**
During 2019, 99.1 % of households had access to piped water , 93.1 % of households had access to electricity, and 91.2 % had access to sanitation (Provincial Treasury, 2020). The most recent waste management service levels indicate that 96.9% of households have access to refuse removal services.
- **Provincial economy**
The Western Cape economy enjoyed continued growth over the last decade, however the average growth rate gradually slowed since 2011 to an average annual growth of 1.9% between 2010 and 2019. Due to the Covid-19 pandemic and associated lockdowns during 2020, the Western Cape economy suffered along with the rest of South Africa and the tourism and hospitality sectors suffered significant losses, while agriculture was the only sector that contributed positively to GDP growth (Provincial Treasury, 2020).
- **Overview of waste management**
In the Western Cape, municipalities and industry are required to report waste disposal and diversion data on the provincial Integrated Pollutant and Waste Information System (IPWIS) on a monthly basis. The data is then uploaded to the national South African Waste Information System (SAWIS). There are however registered private and municipal facilities that consistently do not report to IPWIS. Specifically, Beaufort West and Oudtshoorn (0 reporting between 2018-2021) municipalities are of concern due to the consistent low reporting rate of municipal facilities.

According to IPWIS, most of the waste generated in the province is disposed of i.e. between 72% and 78% of waste was disposed of per year during 2018-2021 and 28% and 22% is diverted. A large portion of garden waste and construction and demolition waste that enters WDFs is diverted, however only a small percentage of municipal waste that enters WDFs is diverted. Municipalities have undertaken several waste minimisation initiatives to support diversion. These include separation-at-source initiatives e.g. split-bag systems, the establishment of materials recovery facilities (MRFs) as well as supporting swap shops and buy-back centres. The Department of Environmental Affairs and Development Planning (hereafter referred to as the "Department") has also undertaken several waste minimisation initiatives specifically aimed at providing waste minimisation training to a wide range of stakeholders including municipal officials and waste collection staff, Expanded Public Works Programme workers, private recyclers, and the youth working in waste management. In recent years, Department has focussed on organic waste diversion initiatives to assist municipalities in meeting the provincial organic waste diversion targets of 50% diversion by 2022 and 100% diversion by 2027.

One of the key drivers for moving away from waste disposal is the limited landfill airspace availability in municipalities. Since many of the existing WDFs will run out of airspace within the near future, municipalities will have to bear higher development and operational costs to increase available airspace. Some municipalities are currently struggling to ensure that existing WDFs meet their Waste Management Licence conditions, which could lead to environmental and health impacts. In addition to WDFs, other key waste management infrastructure includes waste drop-off facilities, transfer stations, composting facilities and MRFs.

The NEM:WA requires the designation, in writing, of provincial and municipal waste management officers (WMOs) to coordinate waste management matters. To improve the governance of waste management in the province, the Department maintains regular contact with WMOs e.g. through the establishment of a Provincial WMOs' Forum where feedback is provided on the issues emanating from the various District WMOs' Forums. Currently, 26 of the 30 municipalities have designated WMOs. The provincial WMO is Mr Saliem Haider.

With respect to waste management planning, approximately half of municipalities in the province have IWMPs which are endorsed. Municipalities within the Central Karoo District are being assisted by the DFFE with funding to develop their IWMPs. Challenges include that some municipalities have outdated IWMPs, which must be reviewed to ensure that they are still relevant. A further challenge is that there needs to be improved monitoring and reporting of the implementation plan to ensure that planned activities are implemented.

A gaps and needs analysis was undertaken which identified the waste management challenges in the province.

■ Gaps and needs analysis

A gaps and needs analysis identified waste management gaps and needs in the province that need to be addressed to achieve the desired-end state for waste management. The identification of waste management gaps were from the following sources:

- An analysis of the extent of implementation of the WC IWMP 2017-2022;
- Situational Analysis;
- Gender Gap Analysis;
- Consultation and engagement with internal and external stakeholders.

Priority needs were formulated based on the gaps identified and are indicated below:

- Accurate and consistent (reliable) waste data from industry and municipalities.
- Targeted waste education and awareness programmes, which include various role-players.
- Improved access to waste collection services, specifically in underserved areas.
- Improved promotion of prevention, reduction, re-use and recovery of waste to support a circular economy.
- Integrated waste management infrastructure for recovery, treatment and disposal and an increase in compliance with waste management legislation.
- Strengthened governance and partnerships, and ensuring sustainable financial management
- Respond to the needs of women and other vulnerable groups.

The prioritised needs above informed the development of strategic goals and objectives.

■ Strategic goals and objectives

Four strategic goals were identified and align to the NWMS, 2020. Each goal has objectives, which will assist in meeting the goal. The strategic goals and objectives are indicated below:

- Goal 1: Strengthened education, capacity, awareness and advocacy towards Integrated Waste
 - Objective 1: Facilitate industry responsibility in integrated waste management;
 - Objective 2: Create awareness and education of integrated waste management; and
 - Objective 3: Build and strengthen integrated waste management capacity.

Expected outcome: Improved waste management and the prevention of pollution, litter and illegal dumping.

- Goal 2: Improved integrated waste management planning and implementation for efficient waste services, technologies and infrastructure
 - Objective 1: Facilitate municipal integrated waste management planning;
 - Objective 2: Promote industry waste management planning and the circular economy;
 - Objective 3: Promote the establishment of integrated waste management infrastructure; and services; and
 - Objective 4: Ensure effective and efficient waste information.

Expected Outcome: All citizens of the Western Cape live in clean communities and have access to well managed and financially sustainable waste services.

- Goal 3: Effective and efficient utilisation of resources
 - Objective 1: Minimise the consumption of natural resources and promote the circular economy;
 - Objective 2: Stimulate job creation within the waste economy; and
 - Objective 3: Increase waste diversion through reuse, recovery and recycling.

Expected outcome: The reduction of waste to landfill through increased re-use, recycling, recovery, refurbishment and alternative waste treatment.

- Goal 4: Improved compliance with the environmental regulatory framework
 - Objective 1: Strengthen compliance monitoring and enforcement;
 - Objective 2: Facilitate the rehabilitation of Waste Management Facilities

Expected outcome: Creating a culture of compliance with zero tolerance towards pollution, littering and illegal dumping.

Actions for implementation were identified to support the strategic goals and objectives and included in an implementation plan. Timeframes, responsibility and output indicators for each activity is included in the implementation plan. Activities will be monitored to ensure implementation.



1. INTRODUCTION

This report serves as the 3rd generation Western Cape Integrated Waste Management Plan for 2022-2027 (WC IWMP 2022-2027). The National Environmental Management: Waste Act 59 of 2008, as amended (NEM:WA) requires that provincial governments and municipalities develop IWMPs to ensure proper waste management planning. The primary objective of an IWMP is to integrate and optimise waste management planning by maximising efficiency, minimising associated environmental and financial costs and to improve the quality of life of citizens (DEA, n.d.). This is especially important given the current situation where there are many socio-economic challenges being experienced, such as low economic growth, high fuel and transport costs, inequality, poverty, high unemployment levels, housing shortages, high rates of informal settlement growth, load shedding and high rates of crime and violence (including gender-based violence), as well as pressures linked to climate change. The war in the Ukraine and COVID-19 pandemic has further exacerbated many of these issues e.g. during the height of the COVID-19 pandemic, waste management budgets were required to be reprioritised for COVID-19 relief measures, which would have impacted waste management services. It is thus necessary to prioritise and optimise waste management within the current socio-economic context.

Although the Western Cape has made several improvements in terms of waste management, several challenges exist. Some notable waste management challenges include limited waste management infrastructure, low levels of compliance at a number of waste management facilities (WMFs), high levels of illegal dumping, limited landfill airspace, lack of budgets prioritised and ring-fenced for waste management, shortage of experienced and qualified waste managers, low levels of governance, political interference, and escalating waste management costs. Waste management is closely linked with environmental pollution and climate change, since improper waste disposal contributes to surface and groundwater pollution and greenhouse gas (GHG) emissions. Overcoming these challenges requires an integrated approach to waste management.

The National Waste Management Strategy, 2020 (NWMS) notes that municipalities still favour a collection and disposal approach to waste management and that these municipalities find it difficult to implement an integrated waste management system as per the waste management hierarchy. The NWMS promotes the waste management hierarchy and circular economy as key principles for waste management, while focussing on socio-economic development which is equitable, inclusive, sustainable and environmentally sound. It aims to address the role of vulnerable groups in the informal waste economy and to support and address the skills gap of women, youth and people with disabilities in the circular economy. The WC IWMP will be aligned to the NWMS as well as other key strategic documents, which informed the desired-end state for integrated waste management in the province.

1.1. Scope of the WC IWMP

This Plan covers the geographical area of the Western Cape Province of South Africa, which makes up 10.6% of the country's land surface and covers an area of approximately 129 462 km² (Figure 1). It is the fourth largest province in South Africa and is divided into one metropolitan municipality and five district municipalities, namely the City of Cape Town Metropolitan Municipality (CoCT), Cape Winelands District Municipality (CWDM), Central Karoo District Municipality (CKDM), Garden Route District Municipality (GRDM), Overberg District Municipality (ODM) and West Coast District Municipality (WCDM). District Municipalities are further subdivided into 24 local municipalities (Table 1). The CoCT accounts for approximately 66% of the province's population and approximately 72.5%¹ of the waste generated in the province. The WC IWMP aims to provide strategic direction to municipalities and industry within the Western Cape and includes an implementation plan with activities, which the Department will undertake to achieve its waste management goals.

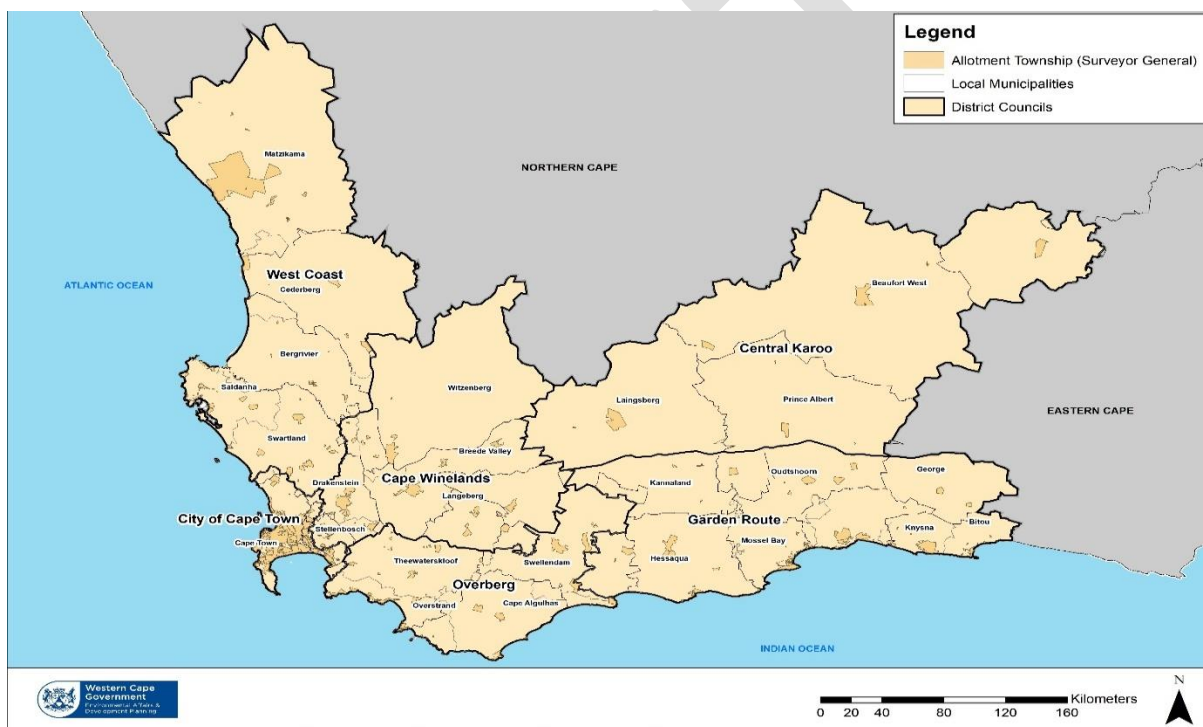


Figure 1: Map of the Western Cape

¹ Based on average figures for 2018-2021

Table 1: Western Cape Municipalities

DISTRICT/METROPOLITAN MUNICIPALITIES	LOCAL MUNICIPALITIES
Cape Winelands	Breede Valley, Drakenstein, Langeberg, Stellenbosch, Witzenberg
Garden Route	Bitou, George, Hessequa, Kannaland, Knysna, Mossel Bay, Oudtshoorn
West Coast	Bergrivier, Cederberg, Matzikama, Saldanha Bay, Swartland
Central Karoo	Beaufort West, Laingsburg, Prince Albert
Overberg	Cape Agulhas, Overstrand, Swellendam, Theewaterskloof
City of Cape Town	N/A

1.2. Background and Purpose of the Integrated Waste Management Plan

As the Western Cape aims to move away from “end-of-pipe” solutions, integrated waste management is becoming more important. Integrated waste management incorporates the waste management hierarchy by considering direct impacts e.g. transportation, collection, treatment and disposal of waste, and indirect impacts e.g. use of waste materials and energy (Turner and Powell, 1991; Korhonen et al, 2004 in Seadon, 2006).

The 2nd generation Western Cape Integrated Waste Management Plan 2017-2022 (WC IWMP 2017-2022) aimed to provide strategic direction for integrated waste management over the short-, medium- and long-term to provincial government, local government, industry, commerce and civil society. Furthermore, it aimed to facilitate the implementation of the NEM:WA and the NWMS (2011), to improve waste management in the province. As per the NEM:WA, IWMPs must be reported on annually to ensure implementation of activities. To ensure that IWMPs remain relevant, they should be reviewed ideally every 5-years in alignment with the municipal Integrated Development Plan (IDP) cycle.

The specific objectives of the IWMP 2022-2027 are:

- To provide an analysis of the status of implementation of the WC IWMP 2017-2022, which will inform the development of the IWMP 2022-2027,
- to provide an overview of the achievements in the province in terms of waste management,
- to provide an overview of the identified waste management gaps and needs in the province,
- to develop a set of goals, objectives, activities and targets that respond to the identified gaps and needs,
- to take cognisance of aspects relating to gender equality, human rights, socio-economic development, sustainability of waste services, environmental impacts when developing goals, objectives, activities and targets.

1.3. Method and Approach

The DEA and DEA&DP's guidelines for the development of Integrated Waste Management Plans will be used to inform the approach of the WC IWMP 2022-2027.

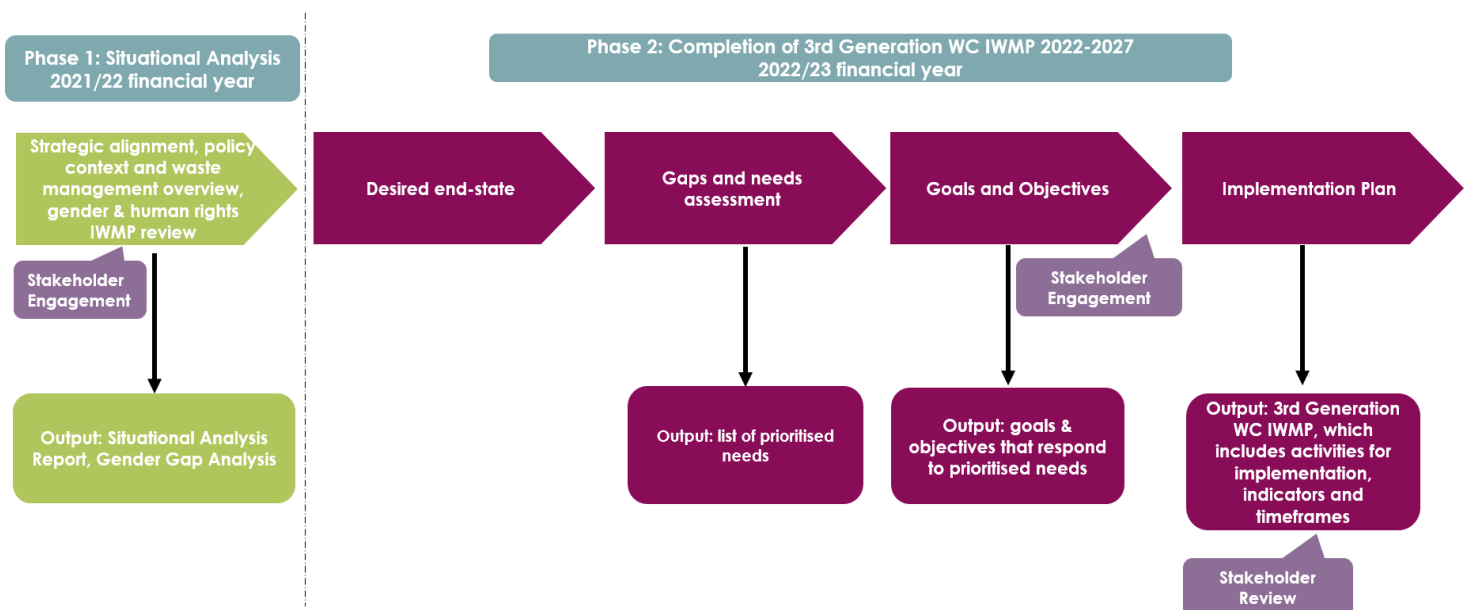
- **Gender Mainstreaming and Human Rights Approach**
A Gender Gap Analysis of the WC IWMP 2017-2022 was undertaken to identify priorities, gaps and make recommendations based on the findings. These findings will be incorporated in the IWMP review to ensure that identified activities are responsive to gender and human rights issues.

- **Planning Process**
The IWMP planning process used during the development of the IWMP is as per the DEA IWMP guideline document. It encompasses the following –

- **Situational Analysis:** The WC IWMP includes a Situational Analysis, which provides an overview of the socio-economic situation in the Western Cape as well as waste management information relating to e.g. generation and composition, diversion, disposal, compliance and institutional arrangements.
- **Desired End-state:** The provincial IWMP includes a vision for waste management in the province as well as strategic goals and objectives to achieve this vision. The desired end-state aligns to key policies including the global Sustainable Development Goals (SDGs), the National Development Plan 2030 (NDP), the NWMS(2020) and relevant provincial policies.
- **Identifying, Evaluating and Selecting Alternatives:** The establishment of a project steering committee, working group and thorough public participation to identify, evaluate and select alternatives that respond to identified waste management gaps and needs.
- **Implementation Plan:** The IWMP will include an action plan with activities and timeframes.
- **Monitoring and Review:** The implementation of the IWMP must be reported on annually. This includes reporting to the national Department of Forestry, Fisheries and the Environment (DFFE), formerly the Department of Environment, Forestry and Fisheries (DEFF). The IWMP will be reviewed and updated every five years. A plan for reporting, review and monitoring is included in Section 7 of this Plan.



The development of the WC IWMP is being undertaken in two phases as depicted in Figure 2. The 2021/22 financial year focused on the development of the Situational Analysis and Gender Gap Analysis, captured in Section 3, whereas the 2022/23 financial year is aimed at the development of the Implementation Plan, captured in Chapter 6.



1.4. Public Participation

Stakeholder engagement will take place throughout the IWMP process (Appendix A). The public participation process is described below.

- Stakeholders were invited to register their interest and be kept informed of the IWMP process via e-mail, newspaper advertisement and the Departmental website.
- A database of stakeholders was compiled and updated throughout the process.
- Stakeholders were provided with an opportunity to comment on the Situational Analysis from 2 February to 7 March 2022.
- A stakeholder engagement workshop was hosted on 23 February 2022. The Situational Analysis findings were presented, and waste management gaps and needs were identified. Due to the COVID-19 pandemic, this workshop was hosted via Microsoft (MS) Teams.
- A notice will be published on the Departmental website, social media, in the Provincial Gazette and in selected newspaper/s calling for comments on the draft IWMP, including the Implementation Plan on 15 September 2022.
- The draft IWMP will be distributed for stakeholder review from 16 September to 16 October 2022.
- A public participation workshop will be held on 7 October 2022 to provide and obtain inputs on the draft IWMP.

1.5. Layout of the WC IWMP

The WC IWMP is divided in several sections as indicated below:

SECTION	OVERVIEW
1. Introduction	Provides a background to the IWMP, including method and approach undertaken.
2. Policy context informing the desired-end state for waste management	Provides an overview of the global, national and provincial policy that informs integrated waste management, including an overview of waste-related legislation.
3. Situational Analysis	Provides a summary of the socio- economic context and waste management in the Western Cape.
4. An analysis of the implementation of the WC IWMP 2017-2022	Provides feedback on the implementation of activities as indicated in the WC IWMP 2017-2022.
5. Gaps and Needs Analysis	Provides the consolidated gaps identified during the Situational Analysis and stakeholder engagement, and a list of priority needs based on the gaps.
6. Implementation Plan	Provides the strategic direction of waste management the Department would like to undertake, which is captured in the vision, mission, strategic goals and objectives, and the Implementation Plan.
7. Monitoring, Review and Reporting	Provides a plan for monitoring, reporting and review.

2. POLICY CONTEXT INFORMING THE DESIRED END-STATE FOR WASTE MANAGEMENT

The desired-end state for waste management is informed by various global, national and provincial level policies. Central themes for the WC IWMP are informed by the NWMS, 2020 and are provided in sections 2.1 and 2.2. Integrated waste management also has several environmental and socio-economic linkages, which are elaborated on in section 2.3.

2.1. The Waste Management Hierarchy

Waste generated must be collected and transported for waste recycling, re-use and recovery before disposal (Figure 3). The waste management hierarchy recognises that there is no single approach to managing all waste and ranks the various waste management options from most preferred to least preferred (Figure 3). The disposal of waste is considered the least preferred method, whereas waste reduction and prevention are most preferred.

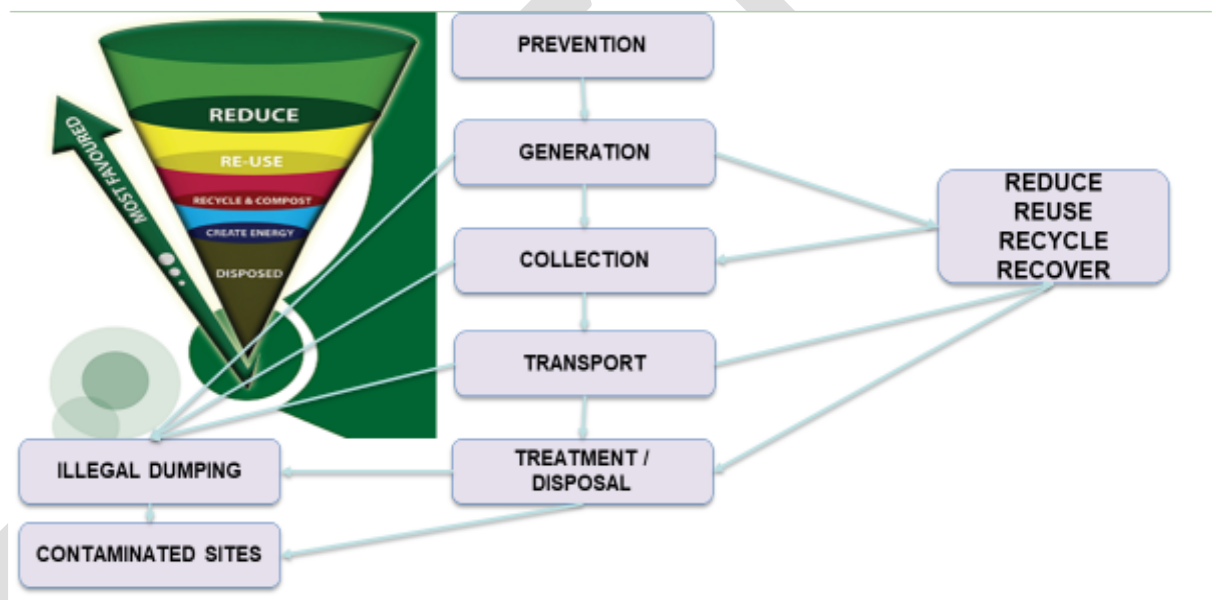


Figure 3: The Waste Management Hierarchy (Source: DEFF, 2020)

Since prevention is the most preferred waste management option, it is a key aspect to the Waste Management Hierarchy. The NWMS, 2020 highlights several factors which may hinder waste prevention.

- Lack of environmental awareness amongst consumers and producers with respect to product design, raw material selection, manufacture, use and end of life;
- Perception that products containing recycled or re-use content is inferior compared those produced from virgin materials;
- The convenience and low cost of landfilling as a waste management option;
- Lack of incentives to motivate waste prevention measures in manufacturing;
- Lack of data on waste streams; and
- Commercial pressure to shorten innovation and product development cycles.

The aforementioned issues need to be addressed to prioritise waste prevention. A shift towards a circular economy could provide benefits in terms of waste reduction, encouraging innovation and the design of products with a longer lifespan. The circular economy is expanded on further in 2.2.

2.2. The Circular Economy

Developing economies, such as South Africa can secure the benefits offered by the green economy by approaching economic growth from a sustainability perspective (PAGE, 2019). According to the DEFF (n.d.), the green economy refers to two inter-linked developmental outcomes for the South African economy:

- Growing economic activity, which leads to investment, jobs and competitiveness in the green industry sector, and
- A shift in the economy towards cleaner industries and sectors i.e. the circular economy Figure 5.



Figure 4: Relationship between waste, the circular and green economies and sustainable consumption and production(SCP)

The circular economy contrasts the 'take-make-waste' linear economic model and aims to decouple growth from consumption of finite resources (Ellen Macarthur Foundation, 2017) (Figure 5). Principles of the circular economy include designing out waste, keeping materials in use and regenerating natural systems (CSIR, 2021). A circular economy model minimises the need to extract virgin materials and emphasises the importance of building a secondary resources economy around the beneficiation of waste (DEA&DP, 2016).



Figure 5: The Circular Economy Model (Source: UNIDO, 2017)

The circulation of materials within the circular economy is depicted in Figure 6 as biological (left) and technical cycles (right).

The biological cycle incorporates the use of technology in which biodegradable materials are returned to the biosphere e.g. anaerobic digestion, composting and biogas recovery. The technical cycle entails keeping products and materials in circulation through processes such as re-use, repair, refurbishing and recycling.

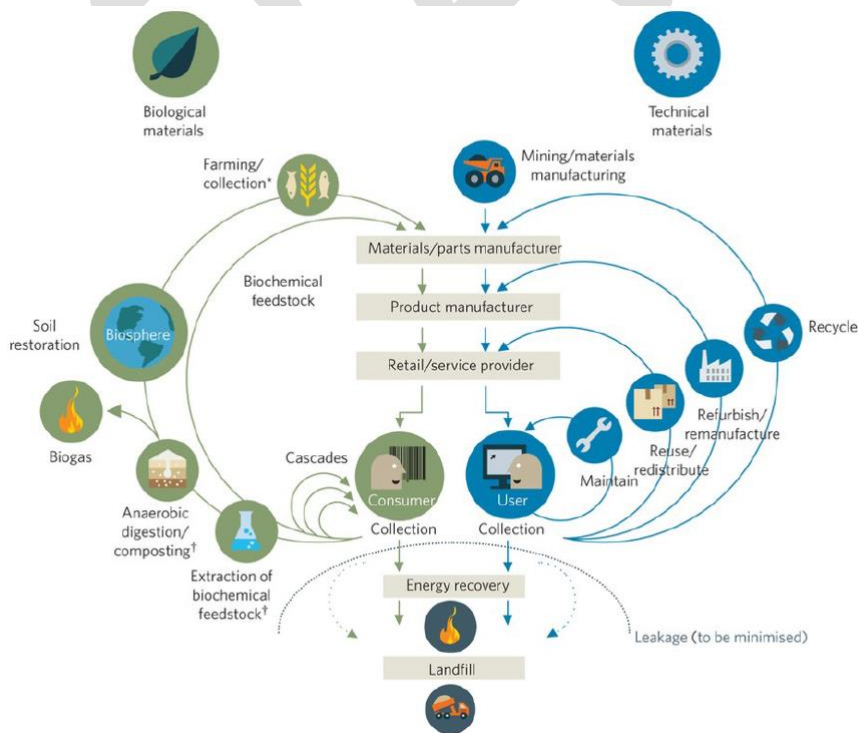


Figure 6: Biological and technical cycles of the circular economy (Source: Ellen MacArthur Foundation, n.d)

The NEM:WA promotes the circular economy and has a provision for Extended Producer Responsibility (EPR), with the aim of reducing waste through minimisation, re-use and recycling. EPR is the commitment made by a producer to facilitate a reverse collection mechanism and recycling of end of life, post-consumer waste. The objective is to circle it back into the system to recover resources embedded in the waste.

The Department aims to assist national government with the implementation of EPR in the province as well as stimulate and provide support to the refurbishment sector.

2.3. Cross-cutting Issues and Waste Management Linkages

The WC IWMP considers several waste management linkages and cross-cutting issues. Waste management touches on all aspects of sustainable development i.e. environment, society and economy, and is therefore associated with a range of global issues linked to climate change, public health, poverty, food security, resource efficiency, production and consumption (ECD Monrec, 2018). These cross-cutting issues align with the issues identified in the global Sustainable Development Goals (SDGs) as well as national and provincial policy. An overview of some of the identified cross-cutting issues and waste management linkages is provided as follows:

2.3.1. Climate Change (links with SDGs 7, 11 & 13)

Methane (CH₄) and carbon dioxide (CO₂) have been identified as key GHGs contributing to climate change. CH₄ has more warming power than CO₂ and is therefore a more potent GHG. CH₄ is relatively short-lived in the atmosphere; reducing CH₄ emissions would therefore result in immediate climate change benefits (Larsen, et al., 2015) and slow down the rate of global warming.

According to UNEP, all waste management practices generate GHGs either directly (emissions from the process itself) or indirectly, via energy consumption (UNEP, 2010). Sources of GHG emissions during solid waste management practices include emissions from incineration, composting, anaerobic digestion and mechanical biological treatment; however, landfilling has been identified as a major source of CH₄ emissions compared to other waste management practices (UNEP, 2010). It is therefore necessary to prioritise the national waste management hierarchy and limit disposal of waste to landfill and instead focus on waste avoidance, re-use and recycling.

The Draft 2050 Emissions Pathway Analysis for the Western Cape: 2018 Baseline GHG Emissions Profile indicates that the waste sector (comprising solid waste and wastewater treatment) contributed to approximately 5% of the GHG emissions in the province during 2018 (DEA&DP, 2022). Since the breakdown of organic waste is responsible for CH₄ production, it is a key waste type requiring attention. Organic waste currently accounts for a large portion of waste generated in the province and is conservatively estimated to be 30% of the municipal fraction. The Department has already put organic waste diversion targets in place i.e. 50% reduction of organic waste to landfill by 2022, and a total ban by 2027. These targets along with other measures such as capacity building and municipal organic waste diversion plans, could assist municipalities in reaching significant waste diversion for this waste stream.

2.3.2. Sustainable Consumption and Production (links with SDGs 2, 9 & 12)

In South Africa, the economy is historically carbon- and resource- intensive (PAGE, 2019). While consumption is a driver of economic growth, it directly creates environmental pressures from the use of goods and services (EEA, 2012). Consumption is closely linked with waste generation, i.e. the more people consume, the more waste they generate. The shift to a circular economy model may assist in achieving more sustainable consumption and production (SCP). SCP aims to decouple economic growth from environmental degradation, increase resource efficiency and promote sustainable lifestyles (UNEP, nd). UNEP (2015) lists the following key principles for SCP:

- "Improving the quality of life without increasing environmental degradation and without compromising the resource needs of future generations.
- Decoupling economic growth from environmental degradation by (1) Reducing material/energy intensity of current economic activities and reducing emissions and waste from extraction, production, consumption and disposal. (2) Promoting a shift of consumption patterns towards groups of goods and services with lower energy and material intensity without compromising quality of life.
- Applying life cycle thinking which considers the impacts from all life-cycle stages of the production and consumption process.
- Guarding against the re-bound effect, where efficiency gains are cancelled out by resulting increases in consumption."

PAGE (2019) lists several best practices for SCP, which include multi-stakeholder engagement, punitive measures, financial incentives, voluntary green labelling, corporate reporting and public procurement.

One of the key industries requiring focus in South Africa is the food industry. Inefficiencies in South Africa's food chain, resulted in a total cost of edible food waste of R61.5 billion during 2011 (GreenCape, 2020). Reducing food loss therefore has financial benefits as well as societal benefits if surplus food is donated to those in need.

2.3.3. Job Creation and Poverty Reduction (linked with SDGs 1 & 8)

South Africa is faced with rising levels of unemployment and poverty, which has contributed to it being one of the most unequal countries (Blaauw et al., 2016). The unemployment rate in the country increased from 34.4% in Q2:2021 to 34.9% in Q3:2021, with more women being unemployed (37.3%) than men (32.9%) during Q3:2021 (StatsSA, 2021).

Economic growth is key to alleviating poverty and improving quality of life of people in developing countries (Department for International Development, n.d.). The waste sector has been identified as an economic sector that can significantly contribute towards social and economic development (Godfrey et al., 2014). It is estimated that the value of waste lost to the country's economy through landfilling is more than R17 billion per annum (CSIR, n.d). Moving waste up the hierarchy i.e. away from landfilling and towards avoidance, re-use, recovery and recycling, is not only beneficial for the environment, but provides social and economic opportunities (Godfrey et al., 2014). In 2016, the waste economy contributed R24.3 billion to the South African GDP (DEA, 2017). DEA, 2017 estimates that the waste sector includes between 60 000-90 000 informal waste pickers and 35 000 formal waste jobs. It has been found that despite the positive contribution of waste pickers to society in terms of waste recycling, they remain on the margins of poverty (Viljoen et al., 2016). The DFFE and the Department of

Science and Technology (DST) have developed a Waste Picker Integration Guideline aimed at ensuring the income, conditions, job security, position in the value chain and dignity of waste pickers are improved.

2.3.4. Health and Environmental Impacts (links with SDGs 3 & 6)

Poor waste management and illegal dumping result in environmental impacts such as air, water and soil pollution, which in turn impact human health. Illegally dumped waste and litter often end up in the stormwater system and eventually makes its way to the river system. Rivers are further impacted when solid waste and fats are disposed of into the sewer system, causing blockages and resulting in spills and overflows.

Plastic pollution is another concern which is linked to poor waste management practices. The durability of plastic along with its low manufacturing costs, are some of the reasons why it is so favourable. The low cost of plastic, however, means that it is often mass produced and manufactured for single-use purposes (Bucci et al., 2020). Unmanaged plastic waste is carried into rivers, wetlands, streams, and oceans by wind or flowing water (SETAC, 2019). Plastics physically harm wildlife when they ingest it or become entangled in it. When plastics fragment they form microplastics (less than 5mm long). Microplastics are also manufactured in the form of pellets, scrubbers (as used in cosmetics) and abrasives (synthetic-sand blasting) (Bouwman et al., 2018). Contaminants, found in microplastics are transferred to marine organisms by ingestion, inhalation, and through their skin e.g. polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons, organochlorine pesticides, polybrominated diphenyl ethers, alkylphenols, and bisphenol A (BPA) (Matahlon and Hill, 2014). In addition to the negative impacts on the marine environment, microplastics may also contaminate soils, sediments and freshwater (de Souza Machado et al., 2017).

Waste collection and waste treatment methods also negatively impact the environment. During the collection and transportation of waste, trucks release emissions into the air. Meanwhile, communities living within proximity of dumping sites or poorly managed Waste Disposal Facilities (WDFs) may be impacted by nuisances such as dust, odour and pests. Leachate emanating from the waste body may also contaminate water sources and soil. Other waste disposal measures such as incineration release potential emissions include dioxins and furans in flue gas, which are harmful to human health (Mukherjee et al., 2016). Similarly, harmful emissions including nitrogen oxides, sulphur dioxide, volatile organic compounds (VOCs), carbon monoxide, and particle matter are released into the air when waste is burned (US EPA, 2016). Waste burning is sometimes undertaken by waste pickers on landfills to get to the valuable waste materials such as metals.

Awareness-raising targeted at communities must include linkages between waste and human health. In addition, compliance and enforcement is also important in combatting illegal dumping and ensuring that WDFs are compliant with their Environmental Authorisations.

2.3.5. Gender and Human Rights (SDGs 5, 3, 6)

Poor waste management and pollution may have negative impacts on the rights of citizens. Gender mainstreaming and human rights approaches to waste management ensures that the needs of all vulnerable groups are taken into consideration as outlined in the National Environmental Management Act (107 of 1998) and the NWMS. Furthermore, the Constitution provides that everyone has a right to a healthy environment and to have their environment protected. The proper management and disposal of waste is thus essential in preventing

impacts that may infringe on the rights of citizens. As previously mentioned, the waste sector has been identified as a key sector for economic growth and job creation. Given the high levels of inequality (including gender inequality) in the country, it is important that everyone has equal opportunity to access the benefits of the waste economy and not be discriminated against based on e.g. gender, disability, sexual orientation and race.

A Gender Gap Analysis was undertaken for the WC IWMP 2017-2022. The report examined the differences between men and women with respect to waste management perceptions, behaviour, needs and preferences, health impacts as well as employment in the informal and formal waste economy. The report also highlighted several considerations with respect to other vulnerable groups i.e. people with disabilities' exclusion from employment opportunities, concerning levels of youth unemployment and the exclusion of those with mobility issues from waste management and recycling practices. An analysis of the gaps in terms of gender and human rights were identified. Recommendations were made to inform the development of the WC IWMP 2022-2027, and which must be considered when developing activities for implementation:

- Engage with and improve the participation of women and the youth as well as other vulnerable groups in decision-making and policy formulation.
- Focus on strengthening vulnerable groups' / women's organisations in the waste sector, with the aim to build their organisational, leadership and business management skills.
- Align the Western Cape IWMP with the SDG goals specifically SDG 12, which deals with Sustainable Consumption and Production and SDG 5, which deals with Gender Equality.
- Ensure the IWMP uses gender sensitive language and considers the diverse gender roles and needs.
- Monitor the implementation of the plan to ensure gender responsiveness and gender mainstreaming is achieved.
- Tackle illegal dumping and littering as well as improve compliance at waste management facilities, as not doing so negatively impacts the rights of citizens.
- Provide support to waste pickers about their health, safety, security, dignity, and overall well-being.
- Improve employment and networking opportunities for women, youth and persons with disabilities.
- Use capacity-building as a means to encourage the promotion of women to leadership positions in the various spheres of government.
- Identify projects /outcomes that are gender-specific / vulnerable-group specific.
- Allocate budgets specifically to address gender and vulnerable- group inequalities.
- Include gender mainstreaming requirements in capacity-building training aimed at municipalities and the private sector.

The WC IWMP aligns with several policies, legislation, frameworks, charters and international conventions. The aforementioned focus primarily on environmental sustainability, economic growth, poverty alleviation and equality, including human rights and gender equality. These themes have linkages to waste management. The province aspires to having a waste management system, which focuses on waste avoidance, re-use and recycling rather than disposal, where there is growth in the waste economy and that every citizen in the province has access to sustainable and equitable waste services.

2.4. Global Vision for Sustainable Development

2.4.1. Sustainable Development Goals

The Sustainable Development Goals comprise of 17 goals that were adopted by the United Nation member states in 2015 with the aim to end poverty, improve health and education, reduce inequality, spur economic growth and tackle environmental issues. The key SDG to which the NWMS is aligned to is **SDG 12: Ensure sustainable consumption and production**. However, many of the other goals are also relevant to waste management. Additional SDGs that the NWMS is aligned to include:

- SDG 1: End poverty in all its forms
- SDG 2: No hunger
- SDG 3: Ensure healthy lives and promote well-being for all at all ages
- SDG 6: Ensure access to water and sanitation for all
- SDG 7: Ensure access to affordable, reliable, sustainable and modern energy
- SDG 8: Promote inclusive and sustainable economic growth, employment and decent work for all
- SDG 9: Build resilient infrastructure, promote sustainable industrialisation and foster innovation
- SDG 11: Make cities inclusive, safe, resilient and sustainable
- SDG 13: Take urgent action to combat climate change and its impacts

Since the IWMP aligns with and responds to the NWMS, it consequently aligns with the SDGs mentioned above. In addition, however, the IWMP will also align to **SDG 5: Achieve gender equality and empower all women and girls**.

2.4.2. Multilateral Environmental Agreements

South Africa is signatory to several international conventions relating to hazardous waste. The international conventions as indicated below ensure chemicals are managed within a life-cycle approach, to reduce harmful impacts.

INTERNATIONAL CONVENTION	DESCRIPTION
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 22 March 1989.	Regulates the transboundary movement (import and export) of hazardous waste.
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 10 September 1998.	Aims to facilitate informed decision-making by countries regarding the trade in hazardous chemicals.
Stockholm Convention on Persistent Organic Pollutants, Stockholm 22 May 2001.	Aims to protect human health and the environment from persistent organic pollutants

2.4.3. International Framework for Gender Equality

There are numerous international and regional treaties, policies and conventions that promote human rights and equality. An overview of the international and regional gender framework is provided in Figure 7.

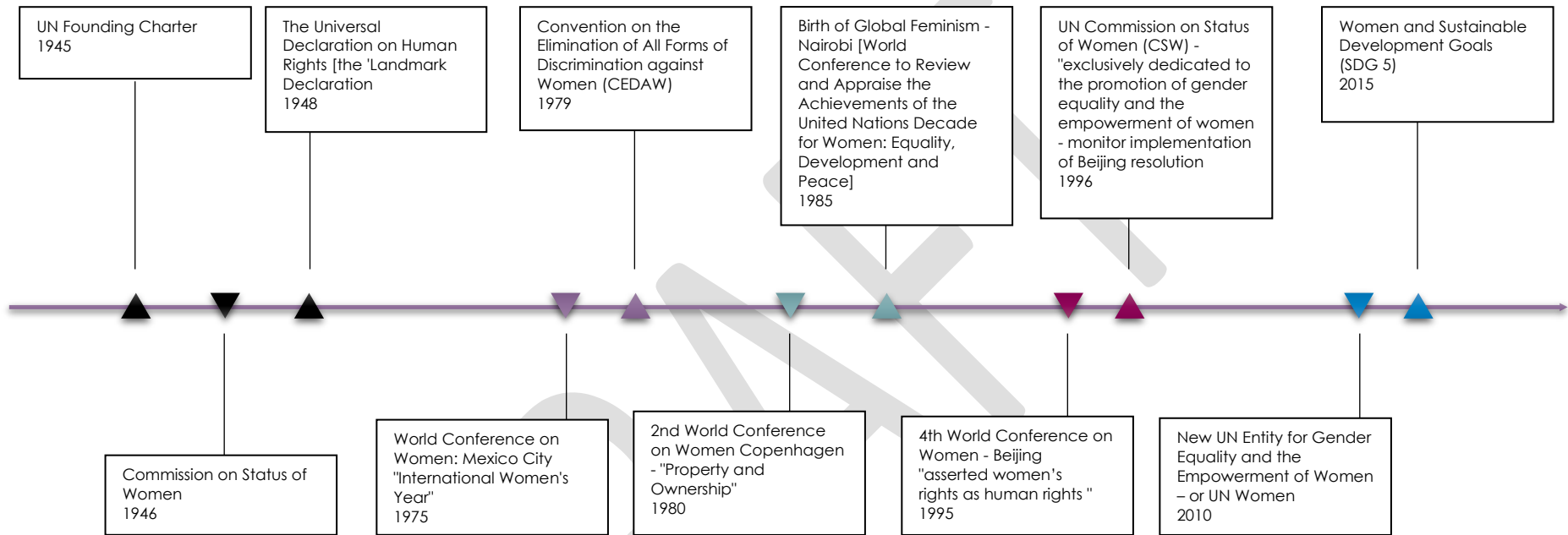


Figure 7: Gender policy development timeline (Source: adapted from DEA&DP, 2020)

2.5. National Policy

2.5.1. The Constitution

The South African Constitution Act (No. 108 of 1996) is the supreme law of the land. The environmental right is set out in Section 24 of the Constitution's Bill of Rights which states that:

Everyone has the right:

- a) to an environment that is not harmful to their health or well-being; and
- b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-
 - I. prevent pollution and ecological degradation;
 - II. promote conservation; and
 - III. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

2.5.2. National Development Plan 2030 (NDP)

The NDP maps out the vision of the country with the key objective to reduce poverty and inequality in South Africa by 2030, by creating jobs, addressing spatial transformation, the expansion of infrastructure and building environmental sustainability and resilience. The NDP specifically recognises the need to focus on gender equality, the youth and people with disabilities as transversal issues cutting across all its overarching goals. It outlines an approach to waste management which includes investment in consumer awareness, green product design, recycling infrastructure and waste-to-energy projects, which would result in significant strides to becoming a zero-waste society.

2.5.3. National Waste Management Strategy, 2020

The NWMS places emphasis on the waste management hierarchy and moving towards a circular economy. The three strategic pillars identified are waste minimisation, effective and sustainable waste services and compliance, enforcement and awareness. The NWMS has the following outcomes:

- Prevent waste, and where waste cannot be prevented ensure 40% of waste diverted within 5 years; 55% within 10 years; and at least 70% within 15 years leading to zero waste going to landfill;
- all citizens live in clean communities with waste services that are well managed and financially sustainable;
- and mainstreaming of waste awareness and a culture of compliance resulting in zero tolerance of pollution, litter and illegal dumping.

The NWMS specifically focuses on vulnerable groups by:

- Addressing the role of vulnerable groups, waste pickers and the informal sector and supporting women, youth and people living with disabilities in the circular economy; and
- Addressing the skills gap within the sector with a special focus on women, youth and people living with disabilities.

2.5.4. National Gender Equality Framework

The Constitution of South Africa and the NDP promotes equality for all citizens, including gender equality. In addition to the above, gender specific policy has been developed in South Africa with an aim to achieve gender equality within government, civil society and the private sector and to ensure that resources are allocated for this purpose.

South Africa's National Policy Framework for Women Empowerment and Gender Equality (National Gender Policy Framework) - aims to ensure that achieving gender equality is the focus of transformation in South Africa, within all structures, institutions, policies, procedures, practices and programmes of government, its agencies and parastatals, civil society and the private sector. It states that to achieve a racist-free, sexist-free society, a paradigm shift is required regarding resource allocation and how people relate to each other.

Public Sector 8 Principle Plan for Heads of Departments on Women's Empowerment and Gender Equality (DPSA, 2007) - includes eight (8) Guiding Principles for Public Service Departments with the purpose of building a commitment for Gender-sensitive mainstreaming in the Public Service. These gendered-positioned principles are imperatives when engaging with, and developing policy (DEA&DP, 2020). Principle 5 refers to "Gender Mainstreaming" and requires that gender perspectives are included in all work of the Department.

Framework on Gender Responsive Planning, Budgeting, Monitoring, Evaluation and Auditing - the Framework focuses on closing the gap between plans and budgets by mainstreaming gender throughout the planning, budgeting, monitoring, evaluation and auditing phases. By doing so, it aims to achieve a more sustainable, comprehensive and multi-sectoral approach to gender mainstreaming within the country's planning, monitoring and evaluation and public financing systems.

2.6. Provincial Policy

A summary of the applicable provincial policies to which the IWMP aligns is provided:

OneCape 2040	The OneCape 2040 aims to transition from an unsustainable carbon-intensive resource-use society to sustainable, low carbon resource use to ensure that the Western Cape Province is recognised as the leader and innovator in the Green Economy. The province supports local government and the private sector to improve the recovery of waste material and beneficial use thereof.
Green Economy Strategy Framework, 2013	The Strategy has a vision to “position the Western Cape as the lowest carbon province in South Africa and the leading green economic hub of the African Continent”. It aims to grow the commercial waste economy in partnership between public and private sectors as a major source of green jobs. To achieve this, innovation in identifying waste materials, enabling an environment to support the waste economy and develop a market by establishing a province-wide waste exchange to support the expansion and creation of new waste enterprises by improving the knowledge of waste resources.
Provincial Strategic Plan 2019-2024 (PSP)	The Plan sets out the WCG's vision and strategic priorities. Five Vision-inspired priorities have been identified, namely growth and jobs, empowering people, mobility and spatial transformation, safe and cohesive communities, and lastly innovation and culture. The PSP has several cross-cutting themes such as gender, youth, climate change resilience and food security.
Western Cape Recovery Plan, 2021	COVID-19 has had a negative impact on the Western Cape economy, and the livelihoods and well-being of people. The Plan was developed in response to these negative impacts. It aligns to and prioritises PSP interventions in light of the greater social and economic challenges, and reduced fiscal resources associated with the pandemic. The Plan is based on key themes, which includes jobs, safety and wellbeing, as a means to achieve dignity.
Provincial Spatial Development Framework, 2014	This Plan addresses the lingering spatial inequalities that persist because of the country's apartheid legacy, unsustainable resource consumption and disposal. It identifies regional planning initiatives to address specific economic, social, natural or unique features in a specific area. Three urban and two rural priority areas have been identified. The feasibility into regionalisation of waste management services in the regional planning areas would need to be explored.
Draft Western Cape Climate Change Response Strategy: Vision 2050 (2022)	The Western Cape Climate Change Response Strategy: Vision 2050 describes a future that the Western Cape province will strive towards. The vision is to be a net zero emissions and climate resilient province by 2050, built on an equitable and inclusive economy and society that thrives despite the shocks and stresses posed by climate change. Four guiding objectives, aligned to the aspiration expressed in the vision, give structure to the response strategy, including:

	<p>1) responding to the climate emergency;</p> <p>2) transitioning in an equitable and inclusive manner to net zero emissions by 2050;</p> <p>3) reducing climate risks and increasing resilience; and</p> <p>4) enabling a Just Transition through public sector, private sector and civil society collaboration.</p>
Provincial Organic Waste Strategy, 2020	<p>The vision is to assist in the creation of a circular economy where organic waste is not wasted within the entire value chain and is instead largely prevented or beneficated to reduce the amounts going to landfill and the major impact on climate change. The Strategy includes interventions being implemented by the private sector and other agencies with an aim of forming synergies to create a fully integrated strategy with good collaborative networks amongst all stakeholders. These interventions include Voluntary Agreements as one mechanism to reduce food waste and loss by utilizing sector body initiatives (e.g., Industry Waste Management Plans). The strategy also identifies possible policy instruments that can be applied by various organs of state to meet the 50% and 100% organic waste bans for 2022 and 2027 respectively. Good information management, public and private sector awareness, and private sector buy-in are required to achieve the 100% organic waste reduction by 2027 as set out by the Organic Waste Strategy.</p>
Department of Environmental Affairs and Development Planning (DEA&DP) Strategic Plan, 2020-2025	<p>The DEA&DP Strategic Plan has identified waste management as 1 of its six key strategic focus areas. It envisions a sustainable and resilient environment that enables an inclusive and transformative spatial economy. It provides the following 5-year targets for waste management:</p> <ul style="list-style-type: none"> ● 50% of waste diverted from landfill. ● 5 districts received departmental SMME support interventions to create jobs and to promote the waste economy. ● 95% of households with access to basic refuse removal services. ● 85% of waste facility owners submitting compliance audits. ● 80% of municipalities with by-laws aligned to NEM: WA. ● 90% of municipalities with 3rd generation IWMPs.
Western Cape Air Quality Management Plan, 2021	<p>Aims to ensure the effective and consistent implementation of sustainable air quality management practices, by all spheres of government, relevant stakeholders and civil society to progressively achieve and efficiently maintain clean and healthy air in the Western Cape.</p>

2.7. Overview of Environmental and Waste Legislation

A summary applicable waste legislation is provided:

ACT/REGULATION	DESCRIPTION	SUMMARY OF IMPACTS
The Constitution of South Africa of 1996	The Constitution is the supreme law of the land. It contains the Bill of Rights, which enshrines the rights of all South Africans.	<p>Section 24 provides all citizens of South Africa to the right to an environment that is not harmful to their health and well-being and to have the environment protected through legislation and other measures.</p> <p>Sets out principles for co-operative governance, to which all spheres of government must adhere to. National, provincial and local governments are seen as distinctive, interdependent and interrelated.</p>
The National Environmental Management Act 107 of 1998	Statutory framework to enforce Section 24 of the Constitution.	<p>Provides several principles applicable to waste management i.e. life-cycle approach, producer responsibility, precautionary principle and the polluter pays principle. Requires the equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being. States that the vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.</p>
The National Environmental Management: Waste Act 59 of 2008	Governing Act for waste management which aims to reform the law regarding waste management to protect health and the environment.	<p>Provides reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.</p> <p>The Act covers a range of issues in integrated waste</p>

		management including, the requirements for a National Waste Management Strategy, the need for and composition of Integrated Waste Management Plans for organs of state, as well as Industry Waste Management Plans. Key definitions for waste, the licensing of activities and addressing contaminated land are also covered by the Act.
National Domestic Waste Collection Standards (GN 21 of 2011)	Provides standards relating to the collection of general waste.	Distinguishes between the levels of service relating to waste collection whilst emphasising that equitable waste collection services must be provided to all households within the jurisdiction of the Municipality.
National Waste Information Regulations (GN 625 of 2012)	Aims to regulate the collection of data and information to fulfil the objectives of the Nation Waste Information System as set out in section 61 of the Waste Act.	Specify registration and reporting requirements to the South African Waste Information System.
Waste Classification and Management Regulations (GN 634 of 2013)	Aims to regulate the classification and management of waste in a manner that supports and implements the provision of the Waste Act.	Provides a mechanism and procedure for the listing of waste management activities that do not require a Waste Management License. Prescribes requirements for; disposal to landfill, timeframes for management of certain wastes and general duties of waste generators, transporters and managers.
Norms and Standards for the Assessment of Waste for Landfill (GN 635 of 2013)	Prescribe the requirements for the assessment of waste prior to disposal at landfill.	Provides a standard assessment methodology for waste prior to disposal at landfill and advises on the total and leachable concentration limits.
National Norms and Standards for Disposal of Waste to Landfill (GN 636 of 2013)	Prescribe the requirements for the disposal of waste to landfill.	Provides detail on the different classes of landfills, the containment barrier requirements and the types of waste acceptable at the different classes of landfill.

		It further stipulates waste disposal restrictions and provides timeframes by which listed waste types would not be allowed on landfills.
National Pricing Strategy for Waste Management (GN 904 of 2016)	Aims to provide the basis and guiding methodology or methodologies for setting waste management charges in South Africa so as to increase diversion from landfill and encourage reduction, reuse and recycling of waste.	Identifies and details three economic instruments for waste management namely; downstream instruments, upstream instruments and subsidy-based instruments.
Extended Producer Responsibility (GN 1184 of 2020)	Aims to provide the framework for the development, implementation, monitoring and evaluation of extended producer responsibility schemes by producers in terms of section 18 of the Waste Act.	To facilitate the effective and efficient management of identified end of life products and to encourage and enable the implementation of circular economy initiatives. Details and the roles and responsibilities of producers as well as the minimum requirements and criteria for EPR schemes.
Amendment of the regulations and Notices regarding Extended Producer Responsibility (GN 20 of 2021)	Provides updates to the Extended Producer Responsibility (GN 1184 of 2020) regulations.	Provides updates to definitions and amendments to regulations pertaining to the EPR schemes as well as their effective date.
National Norms and Standards for Organic Waste Composting (GN 561 of 2021)	Provides a uniform approach for controlling the composting of organic waste.	Aims to reduce the environmental impacts of composting and to ensure that the best practicable environmental option is implemented.

3. SITUATIONAL ANALYSIS

3.1. Socio-economic Profile

Waste generation is influenced by socio-economic factors such as population growth, employment levels, economic development and urbanisation. As more people move from rural to urban areas for economic opportunities, the greater their participation in the economy, which in turn leads to an increase in their material consumption. An increase in consumption may result in an increase in waste generated by households, leading to a demand for waste services. Decision-makers need to collect data on these socio-economic factors for planning purposes and to determine current and future waste quantities.

3.1.1. Population Overview

The Western Cape accounts for 12% (49% males and 51 % females) of the estimated South African total population of 59.62 million (StatsSA, 2020). According to the household survey conducted by StatsSA (2019), 51% of the population in the Western Cape is classified as Coloured with Black Africans and Whites at 33% and 15%, respectively and only 1% of the population is Indian or Asian (Figure 8). The population increased from 6.84 million to 6.97 million in 2020 at a growth rate of 1.79 per cent (Provincial Treasury, 2021). According to StatsSA (2019), the annual population growth between 2002 – 2019 was 1.3%. The population growth is not only attributed to in-migration but an increase in life expectancy (Provincial Treasury, 2021). Compared to the rest of South Africa, the Western Cape has the highest life expectancy at birth for both males and females over time, with an average 65.7 years and 71 years for males and females respectively between 2016 – 2021 (StatsSA, 2020).

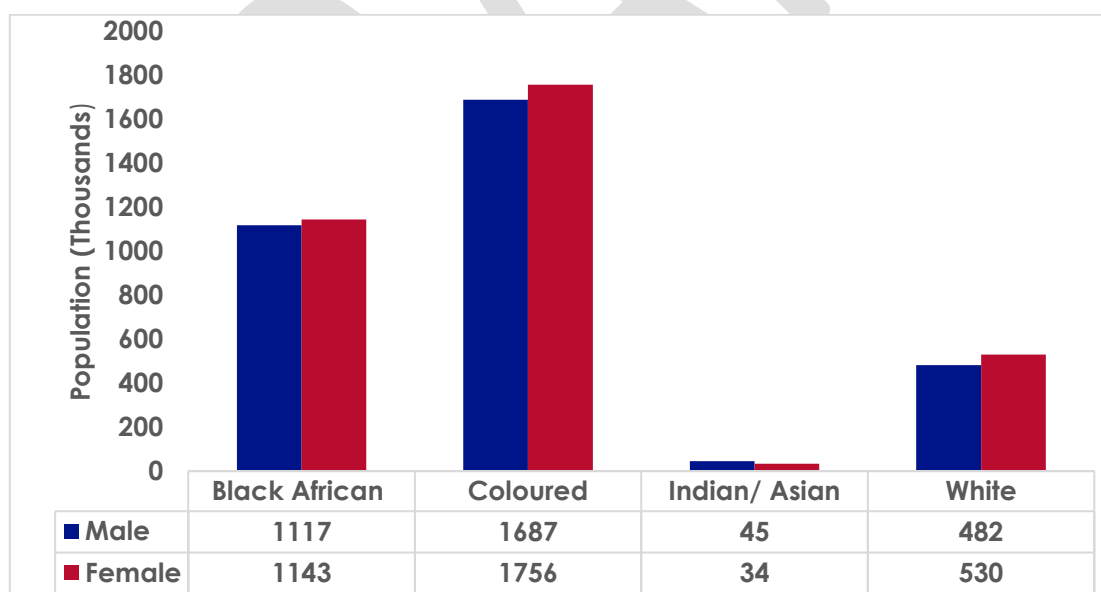


Figure 8: Population by population group and sex (thousands) (Source: StatsSA 2019)

The bulk (65.7%) of the province's population resides in the CoCT (Provincial Treasury, 2021). This translates to a higher demand for services, including waste removal. The provincial Department of Health (WCG: DoH, Circular H102/ 2020) also published population estimates that have been projected to 2030, which are based on the StatsSA 2019 mid-year population estimates (Figure 9). The population is projected to grow from approximately 6.9 million in 2020 to 8.2 million by the year 2030 at an annual growth rate of 1.85% (WCG: DoH, Circular H102/ 2020).

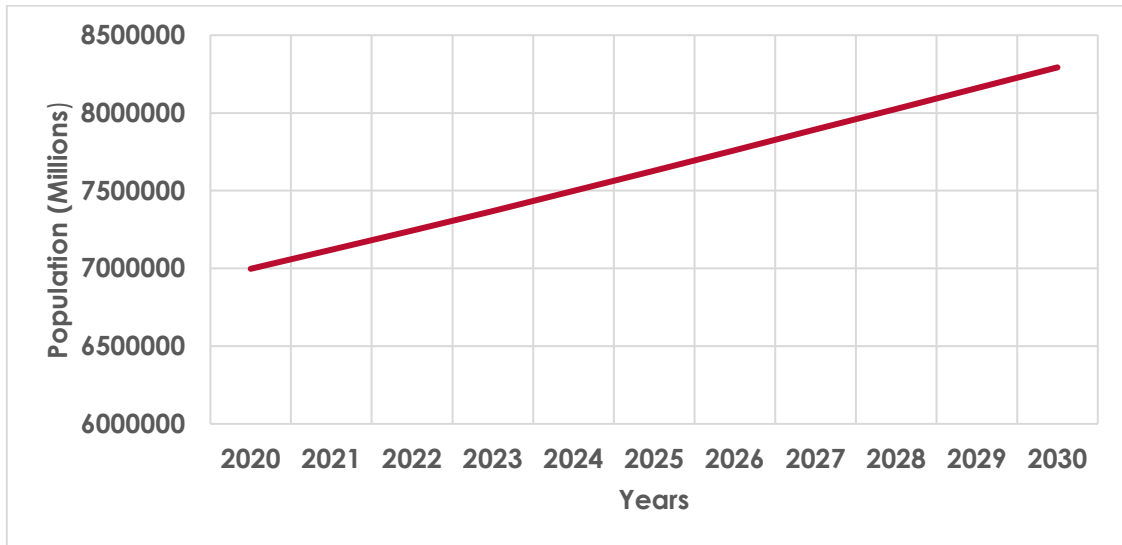


Figure 9: Population projections for the Western Cape (2020-2030) (Source: WCG:DOH, 2020)

The population composition according to age cohort is shown in Table 2. The dependency ratio is 45.3%. The dependency ratio indicates the percentage of children (age 0 - 14) and the elderly (age 65+) who are dependent on the workforce (age 15 - 64). A high dependency ratio implies greater pressure on social systems and the delivery of basic services (SEP-CoCT, 2020).

Table 2: Age Cohorts for the Western Cape (StatsSA, 2020)

Children	0-14 Years	1 710 772
Working Age	15-64 Years	4 820 973
Aged	65+ Years	473 997
Dependency ratio	45.3%	

The province has a larger proportion of the elderly (6.8%) compared to the national average (6.1%) but has a smaller proportion of children (24.4% provincially compared to 29.6% nationally) (Provincial Treasury, 2020). A higher proportion of the working-age population provides opportunities for increased productivity, but the high unemployment rate adds pressure to the demand for public goods and social relief services and opportunities for development (Provincial Treasury, 2020). The COVID-19 pandemic has intensified the unemployment rate as well as the pressure on social relief services.

3.1.2. Employment

During the first quarter of 2020, the Western Cape had a narrow unemployment rate of 20.9% and an expanded unemployment rate of 24.8% (Provincial Treasury, 2020). Narrow unemployment refers to the situation where unemployed individuals are searching for work, whereas expanded unemployment refers to those unemployed individuals who are not searching for work (Provincial Treasury, 2020). The employment rate is indicated by race (Figure 10) and gender composition (Figure 11). From the figures, those classified as Coloured make up the highest portion of the population employed at 46% and more men (54.4%) are employed than women (45.6%).

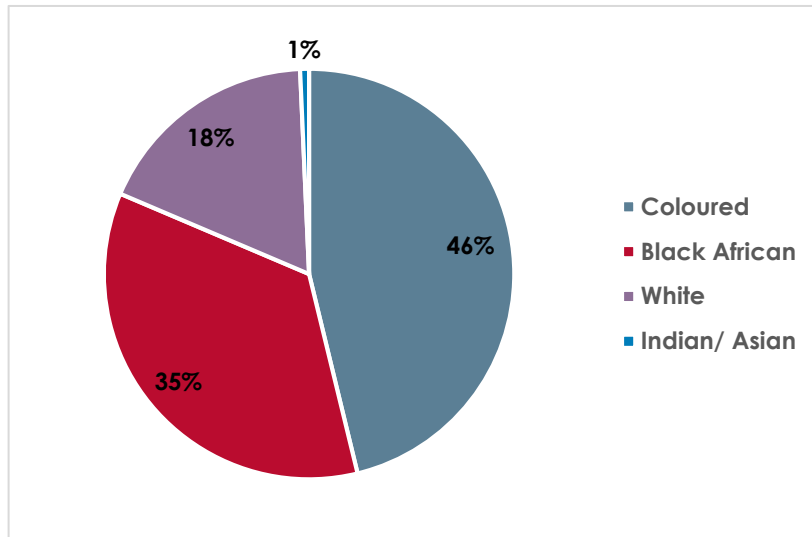


Figure 10: Employment by race composition (information for graph sourced from Provincial Treasury, 2020)

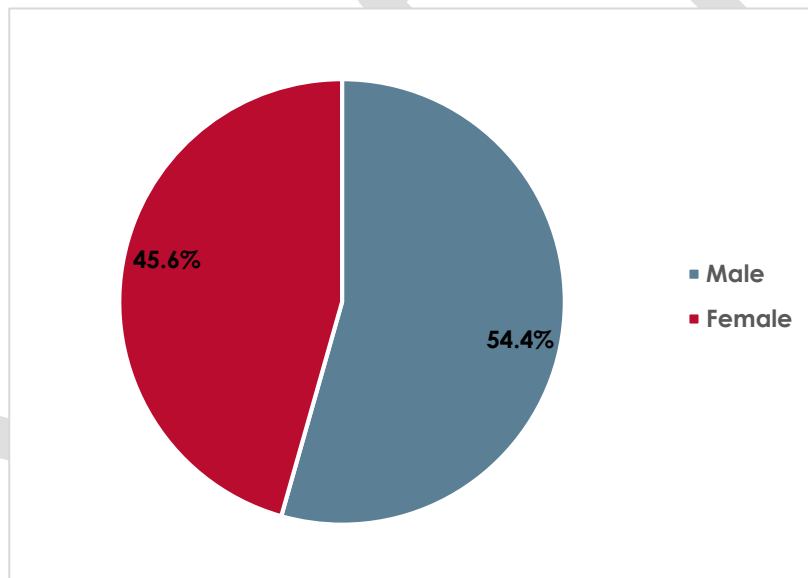


Figure 11: Employment rate by gender (information for graph sourced from Provincial Treasury, 2020)

3.1.3. Household Income

Household income declined by 0.25% on average between 2015 to 2019 with an average annual household income growth of 1.4% that slowed to 1% (Provincial Treasury, 2020). Total household income is expected to remain low in 2020 as economic growth remains slow and is unlikely to show any improvement soon (Provincial Treasury, 2020). As household income declines, the inequality gap increases, which cannot be breached without economic growth. Inequality is measured using the Gini coefficient, a statistical measure that ranges between 0 and 1, with 0 representing completely equal distribution of income (Provincial Treasury, 2020). Therefore, the more unequal the distribution of income, the higher the Gini coefficient. Between 2011 and 2019, the Gini coefficient in the Western Cape worsened (0.593 to 0.618) across all districts and the metro but remained below levels experienced at a national level (0.630) (Provincial Treasury, 2020).

3.1.4. Housing and Informal Settlements

A growing number of people, unable to afford formal housing opportunities, live in informal areas and / or informal housing. According to the Republic of South Africa (n.d.), 18.7% of households in the province reside in informal settlements. As at 15 June 2020, the Housing Demand Database indicated that the province had a housing backlog of 579 547, of which the CoCT accounted for 61%.

Rapid urbanisation, natural population growth and migration, failure of the housing market, labour market dynamics and historical social, spatial and economic exclusionary practices have contributed to the development of informal settlements in the province (DHS, 2016). Informal settlements are associated with certain risks and vulnerabilities such as climate change, xenophobia, HIV, GBV, crime and unemployment (DHS, 2016). Informal settlements are also characterised by lack of infrastructure and basic service provision. In terms of waste management and collection services, due to the narrow streets and topography of informal settlements, door-to-door waste collection services are not necessarily a viable option. Alternative options such as the use of waste collection skips, which allow residents to drop off their waste, are often utilised by municipalities. Consideration should however be given to factors such as capacity of skips, height of skips (to ensure that children are able to reach) as well as distance from households (e.g. crime in informal settlements or household responsibilities may result in women not wanting to walk far distances to drop off their waste).

3.1.5. Municipal Services

During 2019, 99.1 % of households had access to piped water in the Western Cape, 93.1 % of households had access to electricity, and 91.2 % had access to sanitation (Provincial Treasury, 2020). The most recent waste management service levels are indicated in Table 3.

Table 3: Basic refuse removal service levels per district (%)²

WESTERN CAPE OVERALL	96.9%
City of Cape Town	99.2%
Cape Winelands District	100%
Central Karoo District	100%
Garden Route District	86.1%
Overberg District	96.8%
West Coast District	99.3%

3.1.6. Overview of the Western Cape Economy

The Western Cape economy enjoyed continued growth over the last decade, however the average growth rate gradually slowed since 2011 to an average annual growth of 1.9% between 2010 and 2019 (Figure 12). During 2020, the Western Cape economy suffered along with the rest of South Africa and the tourism and hospitality sectors suffered significant losses, while agriculture was the only sector that contributed positively to GDP growth (Provincial Treasury, 2020). The Western Cape is expected to grow on average at an annual growth rate of 1% between 2020 and 2024 but the economy is vulnerable to lockdown restrictions related to the tourism and wine industry (Provincial Treasury, 2020).

² Based on 2018/2019 Annual Reports or the latest municipal IWMP

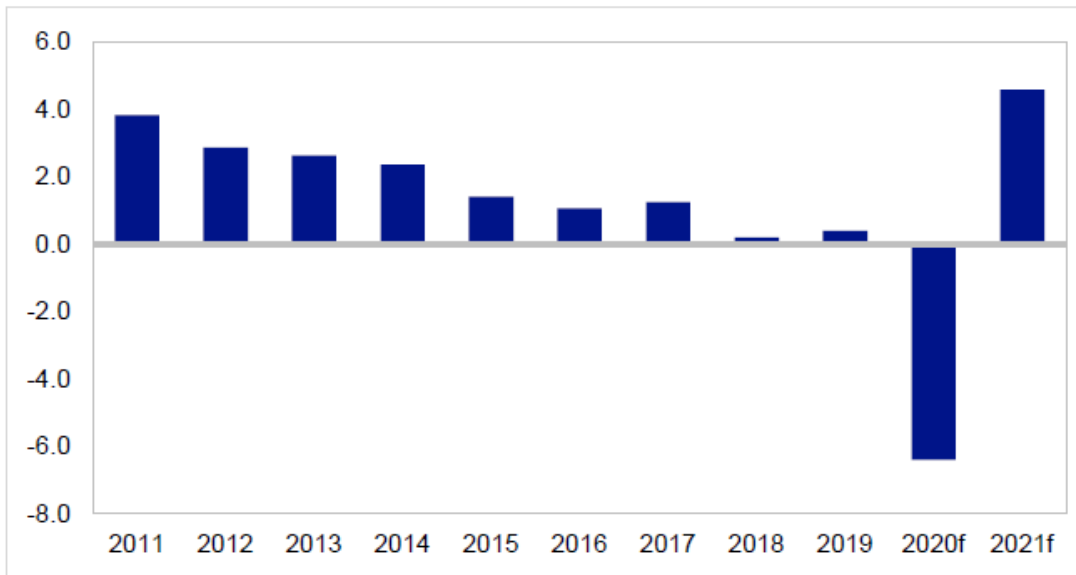


Figure 12: Western Cape economic growth performance 2011-2021

The Western Cape economy has a service-oriented structure and the private services sector contributed 64.1% of the province's Regional Gross Domestic Product (GDP) in 2018 (Provincial Treasury, 2020). The average annual GDP growth of the Western Cape declined to 1% from the 2.8% recorded between 2010 and 2014, between 2015 and 2019 (Provincial Treasury, 2020). The agriculture, forestry and fishing (-2.5%), 'Other' sector (-1%) and construction (-0.3%) sectors recorded negative GDP growth between 2015 and 2019 (Provincial Treasury, 2020). This negative average growth of the agriculture, forestry and fishing sector can also be attributed to the severe drought that started in 2015 (Provincial Treasury, 2020). The private services sector is expected to record the highest average annual growth rate at 1.5%, which will be the largest contribution (79.9%) to Western Cape economic growth (Provincial Treasury, 2020). The Finance, insurance, real estate and business services sub-sector in the CoCT plays a pivotal role in the overall economic growth of the province (Figure 13). The agriculture, forestry and fishing sector is a key contributor to the economies of districts outside of the CoCT. (Provincial Treasury, 2020).

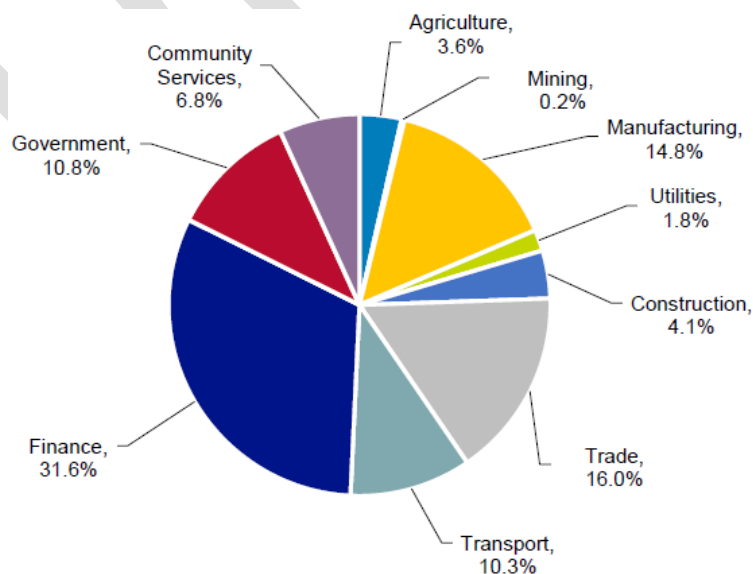


Figure 13: Sector contribution of the Western Cape economy, 2019 (Source: OPRE, 2021)

3.2. Overview of Waste Management in the Western Cape

Within an integrated waste management system, there are various system elements, which include generation and separation, collection, transfer and transport, treatment and disposal, reduction, re-use, recycling and recovery as indicated in Figure 14. The majority of municipalities in the Western Cape currently still focus on disposal, which does not align with the waste management hierarchy. Several municipalities do however undertake separation, recycling and recovery.

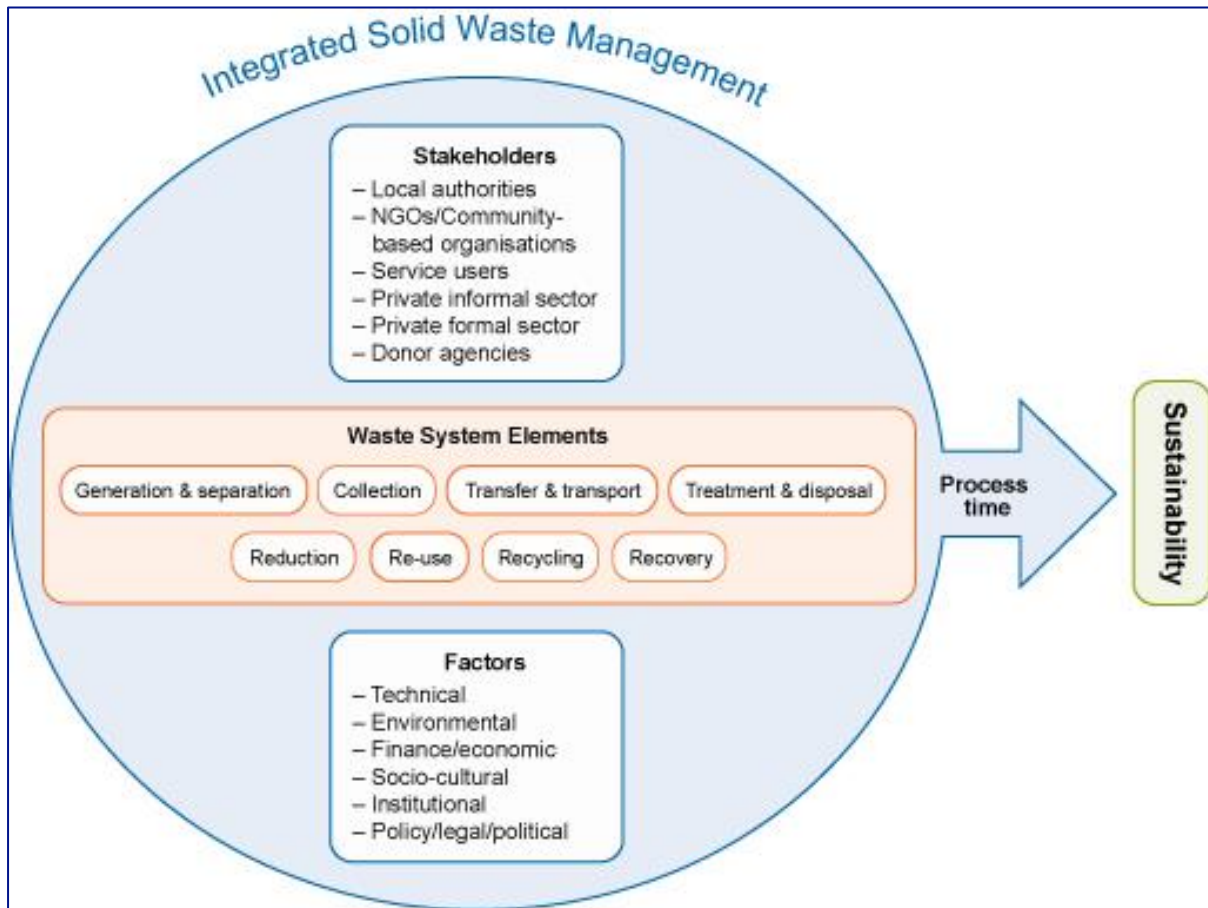


Figure 14: The integrated solid waste management system

The status quo of waste management will be discussed as follows:

- Waste Data
- Waste Generation
- Collection, Transfer and Transport
- Treatment and Disposal
- Waste Minimisation
- Waste Minimisation Initiatives to Support Diversion
- Waste Management Infrastructure
- Governance
- Waste Jobs

3.2.1. Waste Data

Accurate waste information is essential for waste management planning and to provide an understanding of the quantities and types of waste being generated, disposed of, and diverted. In the Western Cape, municipalities and industry are required to report waste disposal and diversion data on the provincial Integrated Pollutant and Waste Information System (IPWIS) on a monthly basis. The data is then uploaded to the national South African Waste Information System. In cases where waste management facilities (WMFs) do not have weighbridges to ensure accurate reporting, the Department's Waste Calculator and Gate Control Sheet is used for estimations.

To ensure there is a good understanding of waste management data in the province, it is important that all the relevant facilities report their waste quantities. However, some registered private and municipal facilities are not reporting to IPWIS (Table 4 and Table 5). Beaufort West and Oudtshoorn municipalities are of concern due to the consistent low reporting rate of municipal facilities (Table 5). Matzikama, Knysna and Witzenberg municipalities have low reporting rates in recent years. Low reporting rates could likely be attributed to staff shortages, especially at municipalities. Reporting frequency for private facilities is affected when private facilities, which have closed down do not notify the Department that they are no longer operating and are thus no longer required to report to IPWIS.

In addition, reporting to the system is not always done accurately. To ensure accuracy of the data reported, the Department undertakes verification of the data received (Box 1).

Table 4: IPWIS compliance reporting rate for private facilities

PRIVATE FACILITIES (GW) – EXCL HEALTHCARE FACILITIES			
District reporting frequency	2018	2019	2020
West Coast	67%	81%	99%
CoCT	63%	61%	66%
Overberg	100%	100%	100%
Garden Route	25%	75%	100%
Central Karoo	0%	0%	0%
Cape Winelands	0%	0%	100%

KEY INSIGHTS

- Accurate waste information is key to waste management infrastructure planning and to determine how municipalities are performing in terms of waste diversion targets.
- Reporting of waste data is a legislative requirement in terms of the National Waste Information Regulations, 2012. Non-reporting is therefore considered a non-compliance.
- Low reporting rates for private facilities and certain municipalities, and the accuracy of the data being reported to the IPWIS, is still a concern.
- Municipalities that consistently have low reporting rates include:
 - Beaufort West Municipality (Central Karoo District)
 - Oudtshoorn Municipality (Garden Route District)
- Municipalities with low reporting rates for 2021 include:
 - Matzikama Municipality (West Coast District)
 - Knysna Municipality (Garden Route District)
 - Witzenberg Municipality (Cape Winelands District)

Table 5: IPWIS compliance reporting rate for municipal facilities

DISTRICT MUNICIPALITY	LOCAL MUNICIPALITY	2018	2019	2020	2021
West Coast	Swartland	75%	100%	100%	100%
	Bergrivier	92%	100%	100%	100%
	Cederberg	63%	100%	98%	100%
	Saldanha Bay	100%	100%	100%	100%
	Matzikama	69%	58%	11%	8%
CoCT	City of Cape Town	89%	89%	100%	92%
Overberg	Cape Agulhas	100%	100%	100%	100%
	Overstrand	67%	89%	100%	100%
	Swellendam	100%	100%	100%	100%
	Theewaterskloof	76%	100%	96%	83%
Garden Route	Oudtshoorn	0%	0%	0%	0%
	Kannaland	100%	100%	100%	92%
	George	50%	54%	100%	100%
	Mossel Bay	67%	67%	100%	100%
	Bitou	0%	100%	92%	100%
	Knysna	97%	69%	28%	8%
	Hessequa	92%	99%	95%	86%
Central Karoo	Laingsburg	100%	100%	100%	100%
	Prince Albert	83%	100%	50%	100%
	Beaufort West	35%	22%	0%	7%
Cape Winelands	Drakenstein	100%	100%	100%	100%
	Langeberg	100%	100%	98%	100%
	Breede Valley	67%	67%	89%	58%
	Stellenbosch	100%	100%	67%	88%
	Witzenberg	54%	50%	92%	33%



Box 1: Ensuring accuracy of reported data

To ensure accuracy of the data reported to IPWIS, the Department undertakes annual data verifications of waste data submitted by municipal and private facilities to IPWIS. During 2020 and 2021, the Department continued with the scheduled verifications on the MS Teams virtual platform. Facilities may be randomly selected as part of routine data quality assurance by DEA&DP or may be selected where data anomalies have been displayed, where data looks questionable and where reporting is inconsistent. The most recent data verifications focused on the 2020 calendar year for both general and hazardous waste, across various business sectors and waste activities. Verified facilities were provided with feedback where erroneous and anomalous data were identified. These facilities were requested to review the data for the verified year and make corrections to the submitted data where applicable.

3.2.1.1. Data Limitations

The waste generation, disposal and diversion data presented in the WC IWMP is downloaded from the IPWIS System³. The following data limitations are noted:

- Municipal general waste data should be considered with a degree of caution due to inconsistencies in definitions, data collection methodologies (e.g. some municipalities use weighbridges which are considered accurate, and others use Waste Calculator estimations), data corrections made by IPWIS and completeness of data;
- Tonnes for general waste disposed of and as reported by municipalities on the IPWIS, is mostly based on estimation of the total quantity of municipal solid waste disposed of in the municipal area.
- The tonnages of general and hazardous waste reported as waste generated is based on quantities of waste recycled, recovered, treated and/or disposed of;
- The percentage of waste diverted is calculated using the reported waste diversion on IPWIS (recycled, recovered and treated) total divided by the sum of waste generated;
- Data collection at municipalities is initially captured by gate controllers at the Waste Disposal Facilities (WDFs). The data is then recaptured by data capturers, for which the accuracy could not always be verified, and this data was used.
- Given the variations in the data accuracy of the different waste types, it is not possible to assign an overall level of accuracy to the calculated tonnages of general and hazardous waste disposed of;
- While many municipalities have calculated and reported on waste diversion in their respective municipalities, these waste diversion calculations and methods differ from municipality to municipality. As the data might indicate an over or underestimation of diversion taking place at municipalities, the data reported might change once verification by the Department takes place.

³ general waste data was downloaded on 15 March 2022, subject to change upon data being revised for accuracy/ additional reporting undertaken for the 2018-2021 period

3.2.2. Waste Generation

Waste generation figures are determined by adding the waste disposal and waste diversion figures reported to the IPWIS. Waste is broadly categorised in two main categories i.e. as general or hazardous, based on the risk it poses. General waste includes waste that does not pose an immediate hazard or threat to health or to the environment. Whereas hazardous waste contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological properties of that waste, have a detrimental impact on health or the environment. Waste generation data indicate that there has been a year-on-year decrease in the generation of both hazardous and general waste in the province over the 2018-2020 period. This is expanded on further in sections 3.2.2.1 and 3.2.2.2.

3.2.2.1. General Waste

The year-on-year generation of general waste in the province between 2018-2021 is indicated in Figure 15. Between 2018 and 2020, the total tonnes of general waste generated decreased per annum, with an increase in the total amount of general waste generated from 2020 to 2021. The sharp decline in general waste generated between 2019 and 2020 is most likely as a result of lockdown measures implemented in response to the COVID-19 pandemic. The lockdown measures would have led to a slowdown in the production and manufacturing of goods for local consumption and export as well as job losses and reduced income. The aforementioned would have potentially further reduced consumption.

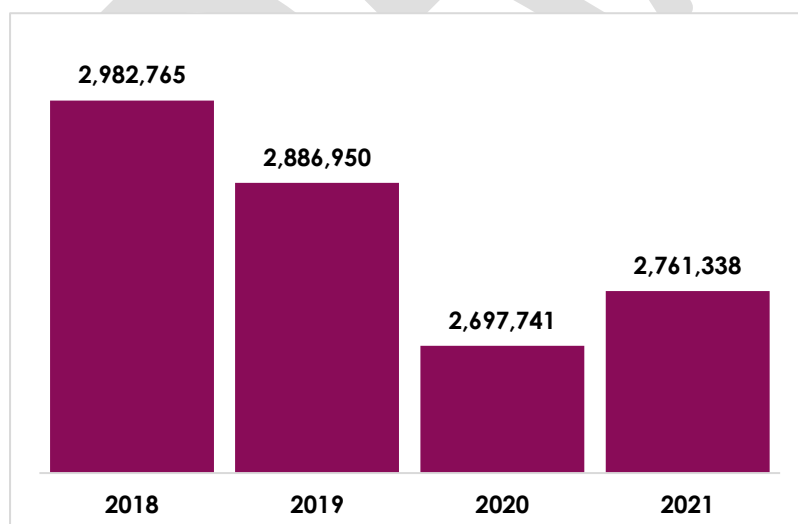


Figure 15: Total general waste generated 2018-2021 in the Western Cape (tonnes)

KEY INSIGHTS

- Despite continued urbanisation and population growth in the province, year-on-year waste generation has declined over the 2018-2020 period. During 2021, there was an increase in the tonnes of waste generated compared to the previous year.
- The COVID-19 pandemic and associated lockdowns (mostly in 2020) compounded the already slow economic growth experienced. Production levels slowed down and unemployment levels increased, which would have slowed down production and consumption of goods, leading to less waste being generated.
- The majority of general waste (approximately 72.5%) is generated in the CoCT, which, which accounts for approximately 66% of the province's population. Most general waste is from municipal sources (57%).
- Hazardous waste generated is mainly due to three key waste types i.e. "inorganic waste", "other organic waste without halogens or sulphur", and "sewage sludge" waste

During the 2018-2021 period, the CoCT accounted for approximately 72.5 % of the general waste being generated in the province (

Figure 16). This is expected since it is the economic hub of the province and is where the majority of the province's population reside. In comparison, the Central Karoo District, which is the least populated district only contributed 0.1% of the total general waste generated in the province over the same period.

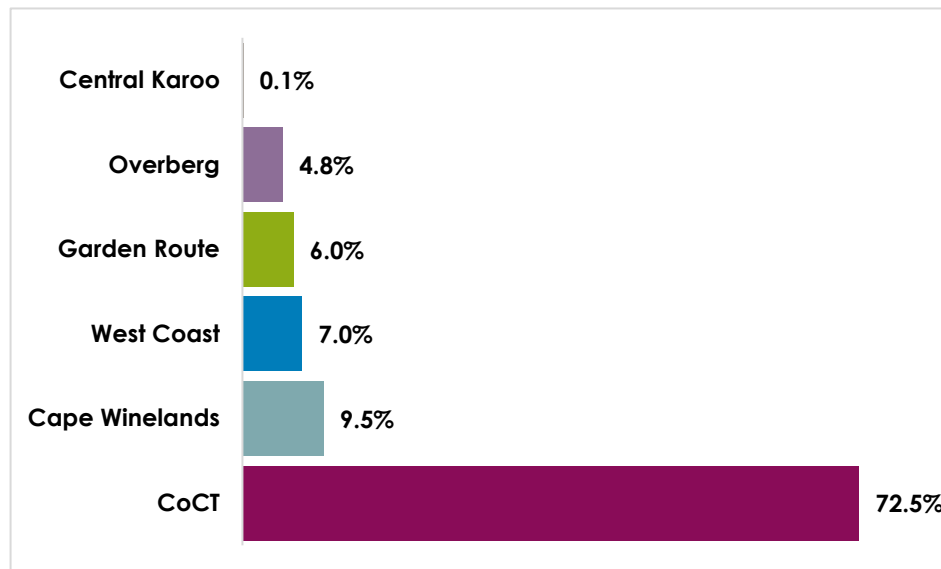


Figure 16: Proportion of general waste generated per district (2018-2021)

General waste is captured in

Figure 17 under five main categories, namely:

- Municipal waste: Waste from households including e.g. organic waste (food waste and garden waste), plastics, paper, metals, construction and demolition (C&D) waste, household hazardous waste, sanitary waste.
- Commercial and industrial waste: General waste from commerce and industry.
- Organics: Mostly refers to garden/green waste collected from split-bag systems or dropped off at municipal waste drop-off facilities.
- Construction and demolition waste: Waste from construction and demolition processes that has been dropped off at a municipal waste drop-off facility and collected during clean-up operations of illegally dumped waste.

- Other: Other general waste that does not fit in the aforementioned categories.

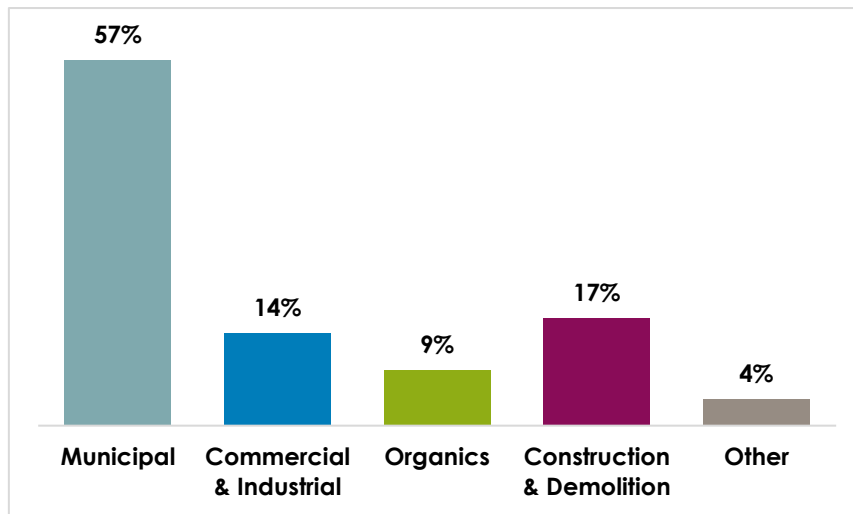


Figure 17: Composition of general waste generated between 2018-2021

3.2.2.2. Hazardous Waste

There has been a slight decrease in the tonnes of hazardous waste generated between 2018 and 2019, and a sharp decline in hazardous waste generated during 2020 (Figure 18). The decline in hazardous waste generated is most likely linked to the lockdown restrictions put in place to curb the spread of COVID-19, which would have slowed down production and manufacturing.

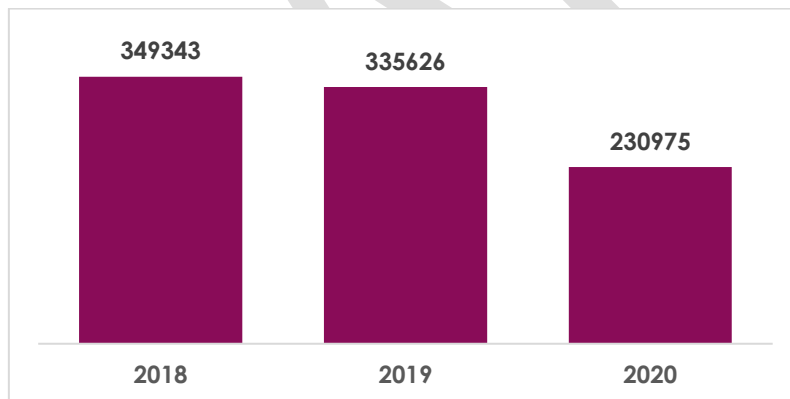


Figure 18: Hazardous waste generated in the Western Cape (tonnes) during 2018-2020 Source, graph DEA&DP: 2021

As highlighted in Table 6, the hazardous waste generated in the Western Cape is mainly due to three key waste types i.e. “inorganic waste”, driven mainly by the casting industry; “other organic waste without halogens or sulphur”, driven mostly by the petroleum refineries and synthesizers; and “sewage sludge” waste. There has however been a sharp decline in the tonnes of inorganic waste generated in 2020, which could be attributed to the COVID-19 pandemic restrictions, which slowed down production of goods. Sewage sludge has been identified as a hazardous waste type of concern. The Department has recently drafted a guideline focused on the beneficiation of sewage sludge and plans to host engagements with municipalities and other stakeholders to discuss beneficiation options for sewage sludge.

Table 6 Hazardous waste types generated in the Western Cape for 2018 - 2020 (tonnes)

WASTE TYPE	2018	2019	2020
Inorganic waste	117 267	111 751	25 541
Asbestos containing waste	8 163	9 161	11 432
Waste oils	30 285	32 275	18 931
Organic solvents without halogens and sulphur	76	248	227
Other organic waste without halogens or sulphur	119 981	117 609	111 756
Tarry and bituminous waste	919	1 412	1 473
Mineral waste	5 097	171	376
Sewage sludge	47 541	48 788	45 806
Miscellaneous	19 719	13 831	14 888
Combined ⁴	296	380	544

⁴ The Combined waste type is the addition of all the waste types that each have a combined value less than 500 tonnes over the three years.

3.2.3. Waste Collection, Transfer and Transport

3.2.2.1. Municipal Waste Collection

Waste collection and transportation is an integral component of waste management service provision. A significant portion of waste management costs is associated with the provision of waste collection and transport services. Although municipalities may be effective at delivering waste collection services, they may not be doing so efficiently. The high cost of waste collection coupled with limited financial resources available to many municipalities, require municipalities to operate efficiently. Efficiency refers to internal operations and involves maximizing the outputs i.e. waste collection services, with the available resources e.g. time, vehicles, staff, financial resources. Some municipalities are undertaking waste collection using aged vehicles, which may be more prone to breakdowns, thereby affecting operational costs and service delivery. During 2020, the average age of vehicles in the province was 10.5 years, which is higher than the vehicle replacement age of 8 years (Figure 19).

Efficiency of waste collection services can be improved by ensuring a proactive approach is taken to maintenance and replacement of vehicles. Several municipalities have vehicle maintenance plans and vehicle replacement plans in place to proactively maintain and replace their vehicles. Some municipalities undertake smaller vehicle repairs internally so as to reduce vehicle downtime. In terms of collection operations, most municipalities do not make use of software to assist with routing and many do not collect accurate data that could be used as inputs into software programmes. Improper route planning may result in waste collection beats not being evenly distributed among vehicles, overlapping of collection points and too many stops, thereby wasting time.

Cooperation between municipalities can be useful in assisting municipalities who do not have sufficient vehicles to undertake waste collection services e.g. Beaufort West Municipality currently has vehicles out of operation due to its aged fleet. Prince Albert Municipality has offered Beaufort West Municipality the use of their vehicles to ensure continuity of waste collection services.

KEY INSIGHTS

- Waste collection represents a significant cost for municipalities, who are already struggling financially.
- Improved planning and efficiency of waste collection services is required to reduce costs.
- Cooperation among municipalities could be a solution for municipalities who do not have enough waste collection vehicles and are having challenges with providing a waste collection service.
- Transportation of waste-on-rail could be considered as an alternative means to transport waste. Waste-on-rail offers several potential benefits such as reduced number of road accidents, reduced infrastructural damage, reduced traffic congestion, reduction in air and noise pollution and reduced land use requirements.

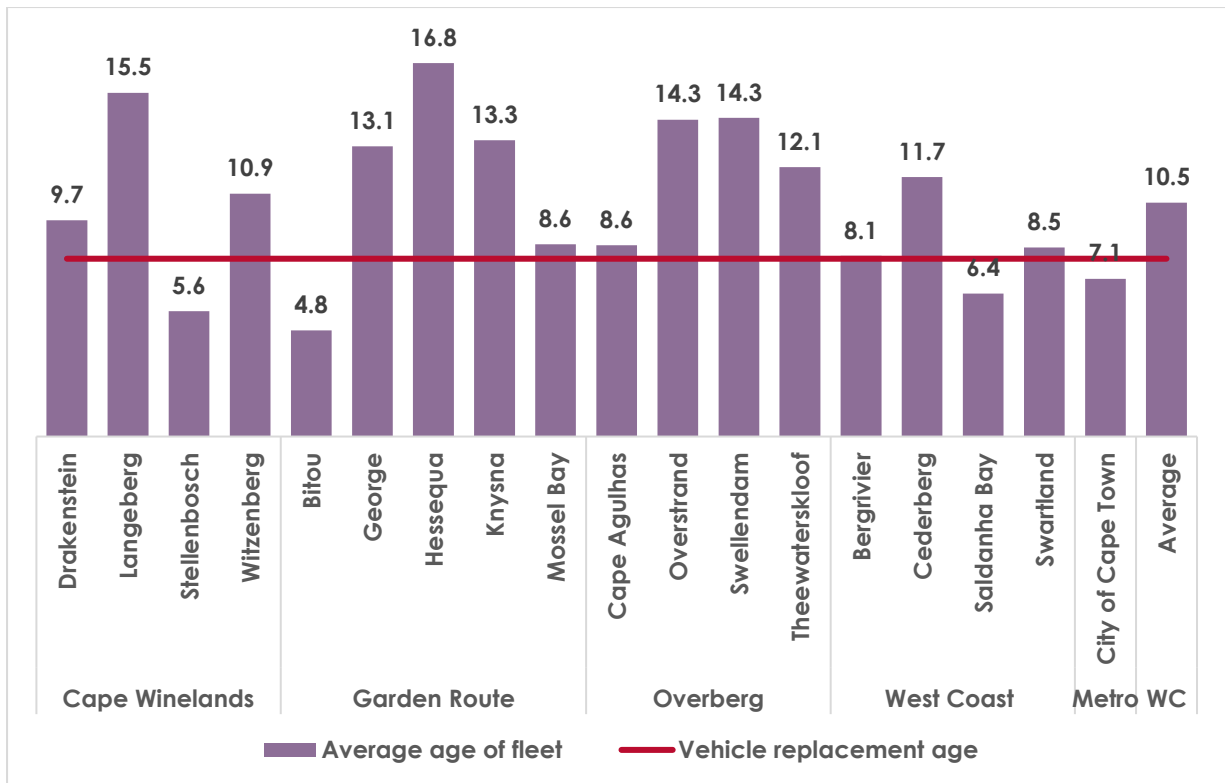


Figure 19: Average age of municipal vehicle fleet

3.2.3.2. Waste-on-rail

Currently, most waste in the Western Cape is transported via road; however, there has been increasing consideration in recent years to include rail as a means for transporting waste. There are several potential benefits of using rail instead of road for freight movement, e.g. (Spoelstra, 2021):

- reduced number of road accidents;
- reduction in road infrastructure damage;
- reduced traffic congestion;
- reduction in air and noise pollution; and
- reduction in land use requirement for infrastructure.

The Western Cape Freight Strategy indicates that a better understanding of the potential of shifting waste transport to rail would be required; this would entail detailed studies or demand modelling to assist with the feasibility thereof. Currently, Transnet supplies a service to the CoCT from Athlone to Kalbaskraal, in which up to 2000 tonnes of waste is transported per day (Western Cape, 2019; Spoelstra, 2021). A proposal was submitted to Knysna Municipality recently by Classic Rail to reinstate the Outeniqua Choo Tjoe services in 2021. The Outeniqua Choo Tjoe will be used as a passenger rail system and could also transport waste via rail to the regional landfill site in Mossel Bay. Classic Rail and the Knysna Municipality have been in discussions regarding the proposal (Knysna Municipality, 2021). Potential challenges associated with the rail system in the province include high rail tariffs, cable theft and lack of maintenance.

3.2.4. Waste Treatment and Disposal

3.2.4.1. Waste Treatment

The NEM:WA defines waste treatment as follows “means any method, technique or process that is designed to:

- (a) change the physical, biological or chemical character or composition of a waste; or
- (b) remove, separate, concentrate or recover a hazardous or toxic component of a waste; or
- (c) destroy or reduce the toxicity of a waste.

In order to minimise the impact of the waste on the environment prior to further use or disposal”

In the Western Cape, the following waste treatment methods are being undertaken:

- Wet/putrescible/organic waste such as food waste, is either composted to produce fertilizer or digested anaerobically to also produce fertilizer.
- Anaerobic digestion allows for the recovery of biogas from waste. Biogas is combustible and can be used as a source of energy.
- Healthcare risk waste is either treated by incineration or autoclaved and shredded prior to disposal. Incineration is a high temperature, dry oxidation process which reduces waste volume and weight (WHO, 2014). Autoclaves are used to disinfect and sterilise waste. Autoclaving treats various infectious waste e.g. cultures and stocks, sharps, materials contaminated with blood and limited amounts of fluids, isolation and surgery waste, laboratory waste (excluding chemical waste) and patient care waste e.g. gauze, bandages, drapes, gowns and bedding) (WHO, 2014).

As per Table 7, the following private treatment facilities manage and treat healthcare risk waste in the Western Cape with a total treatment capacity of 54 tonnes per day:

KEY INSIGHTS

- The waste management hierarchy views waste disposal as the least preferred option for waste management. Waste disposal is still however favoured above other waste management methods by municipalities. Over the past 4 years, waste disposal levels have been 72% and above each year for the Western Cape.
- Although some municipalities have improved by relying less on waste disposal as a waste management option, municipalities within the Central Karoo and Garden Route, have high disposal percentages of 92% and above over the past four years.
- The illegal dumping of waste is widespread throughout the province. Illegal dumping negatively impacts the environment and also has financial implications for municipalities who have to perform clean-up operations.
- The Department is in the process of developing a Strategy to Reduce Illegal Dumping in the Western Cape Province”

Table 7: Health care risk waste treatment facilities in the Western Cape

TREATMENT FACILITY	TREATMENT CAPACITY TONNES/DAY
Averda Killarney (thermal)	24
Averda George (thermal)	12
Compass (autoclave or incineration(outsourced))	12
BCL Medical Waste (ecosteryl microwaving and incineration)	6
TOTAL	54

3.2.4.2. Waste Disposal

There has been a year-on-year increase in the tonnes of general waste disposed of between 2018 and 2019, followed by a decline during 2020 and a slight increase in 2021 from the previous year (Figure 20). In the past few years, municipalities in the Central Karoo and Garden Route districts have relied heavily on disposal (Figure 21)

Meanwhile municipalities in the Cape Winelands, West Coast and Overberg districts have reduced the percentage of waste being disposed of over time. The CoCT, which is the largest generator of waste compared to the other districts, disposed of 77% of the waste generated in 2021.

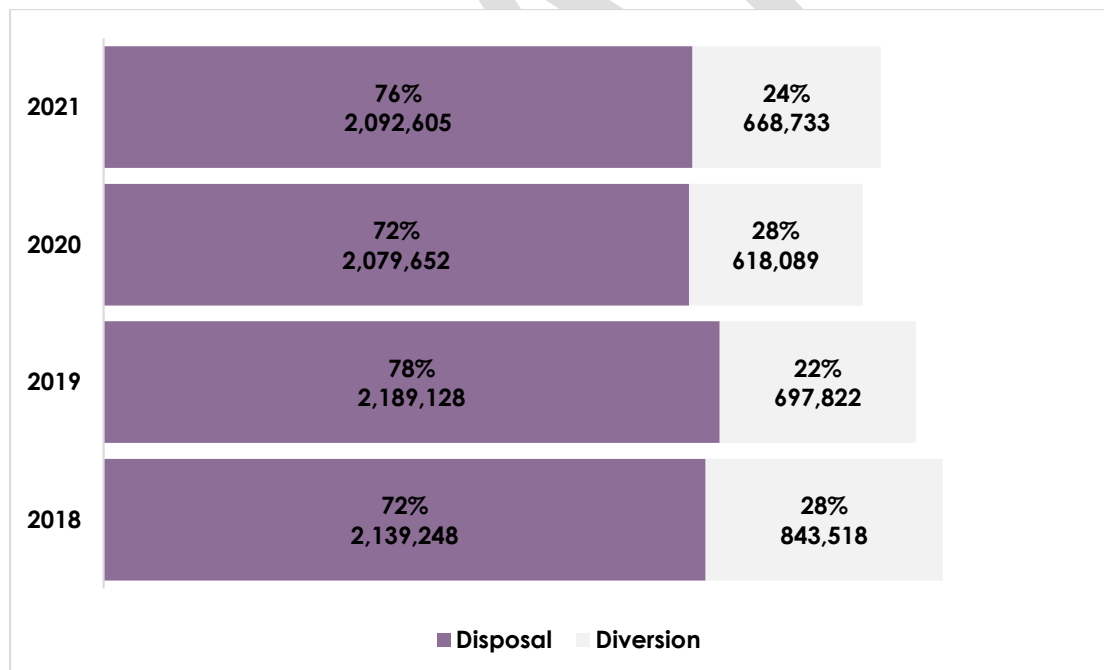


Figure 20: Waste disposal in the Western Cape (percentage and tonnes) for 2018-2021

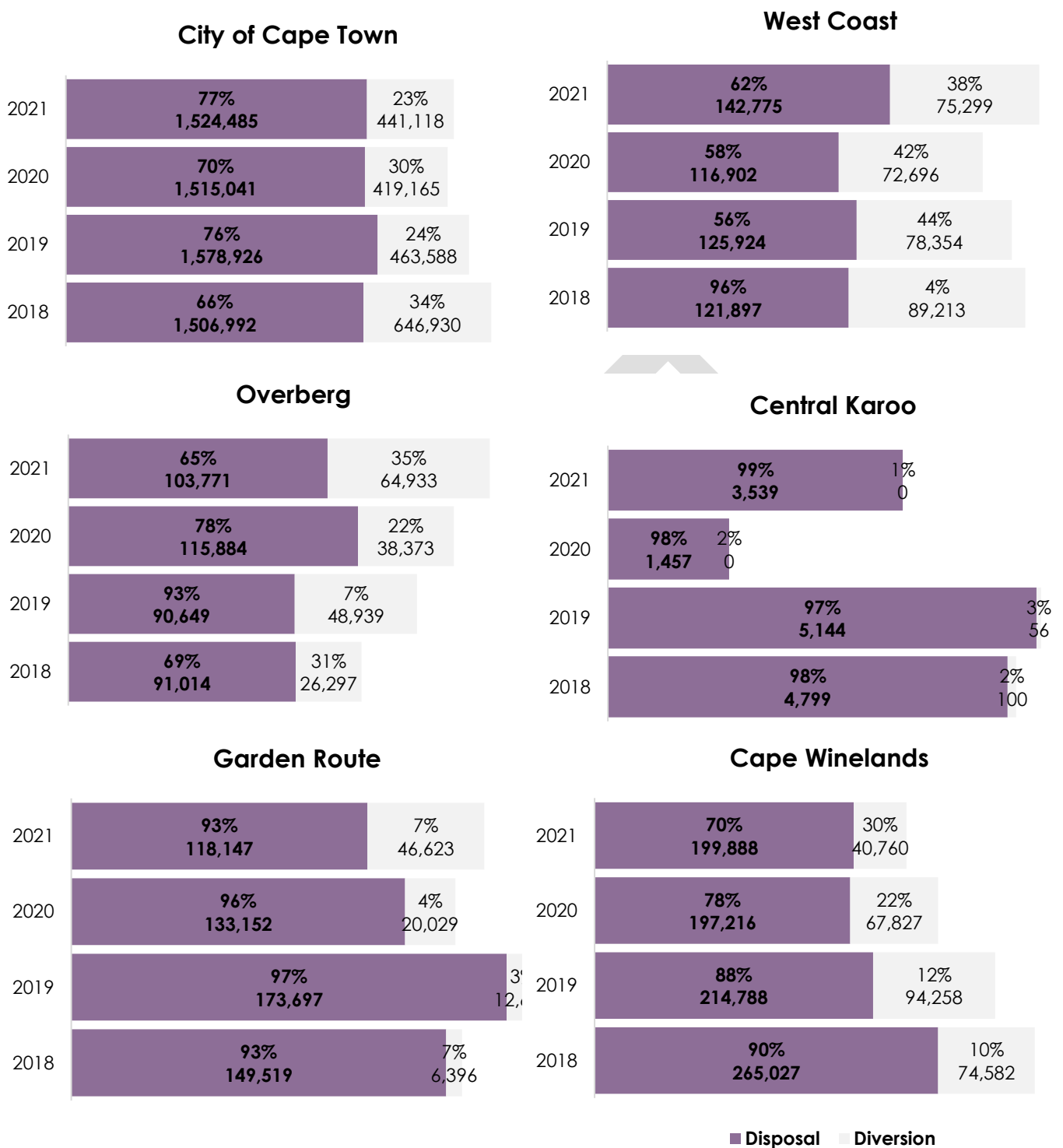


Figure 21: Waste disposal per District (percentage and tonnes) for 2018-2021

With respect to hazardous waste, there has been a decline in the tonnes of waste disposed of over the 2018-2020 period, with a sharp decline between 2019- 2020, as a result of lower hazardous waste generation rates during that period.

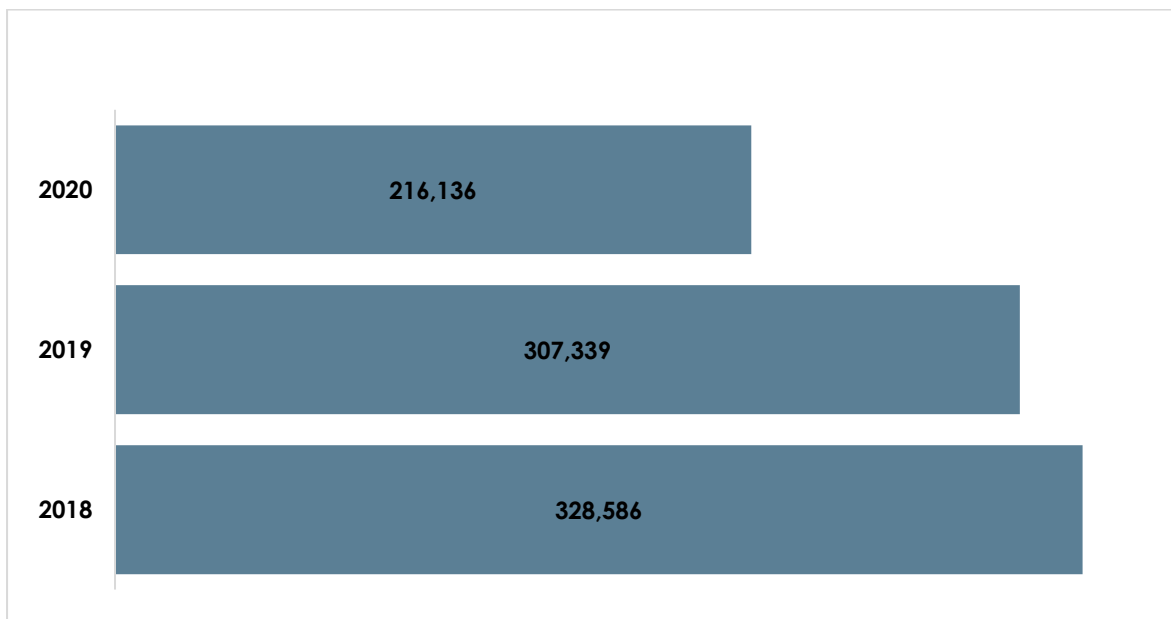


Figure 22: Hazardous waste disposed of in the Western Cape 2018-2020 (tonnes)

3.2.4.3. Illegal Dumping

The illegal dumping of waste is widespread throughout all municipalities in the province. Although the volumes of waste from illegal dumping have yet to be fully quantified, the overall budget required for its clean-up ensures that it is a high priority for many municipalities, who spend significant amounts annually on clean-up operations. Illegal dumping also forms a large portion of the waste-related complaints received by municipalities (Figure 23).

C&D waste (builders' rubble), and general domestic waste constitute most of the waste dumped illegally. During windy conditions, illegally dumped waste often gets scattered across large tracts of land and finds its way to the ocean. Common causes of illegal dumping range from people not wanting to pay disposal fees, too many people using the same wheelie or disposal bin, the misuse of wheelie bins for carting other materials, the inaccessibility of the waste bins and other receptacles for purposes of disposal, amongst others. The use of different methodologies to eradicate illegal dumping across the Western Cape is evident and is mainly due to the different socio-economic challenges and budget constraints for each municipality. It is recognized that each municipality will have a different approach to combat illegal dumping and moreover, eliminate the causes of illegal dumping, based on the circumstances within each municipality.

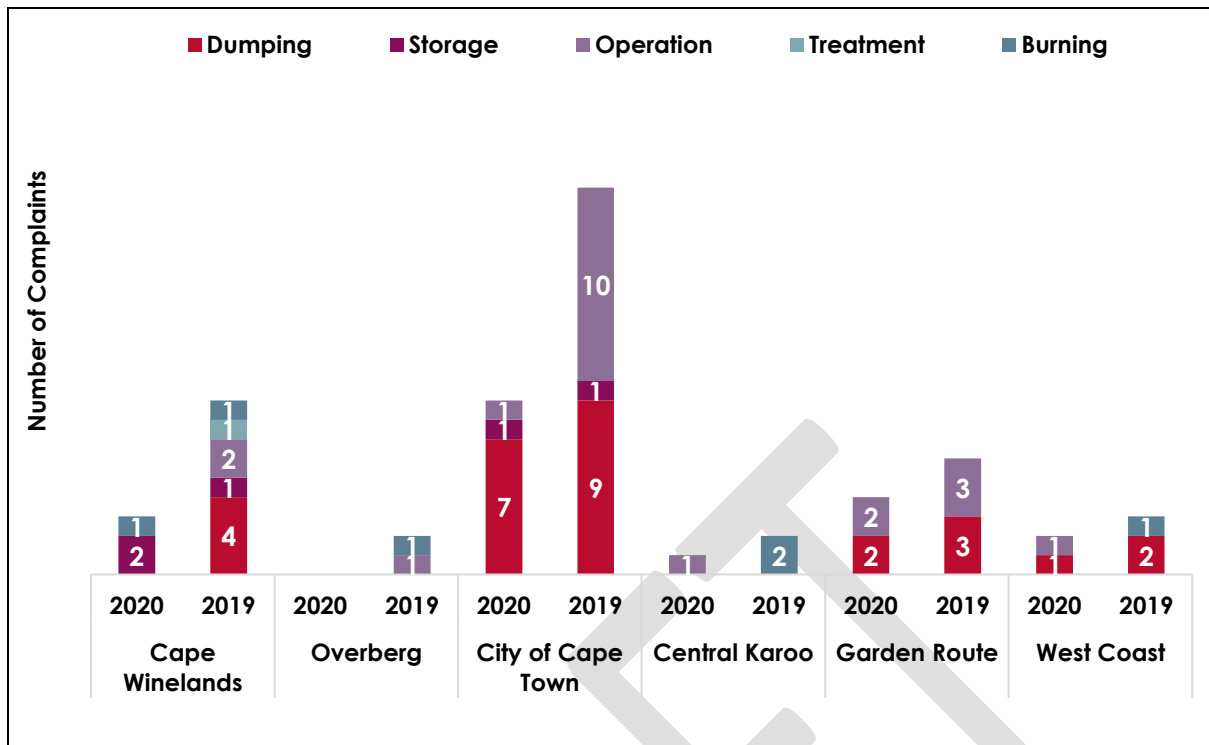


Figure 23: Waste-related complaints received at Waste Management Facilities (2019-2020) Source: DEA&DP, 2020

The illegal dumping of waste is currently being prioritised:

- Many municipalities have rolled out illegal dumping pilot projects and conducted awareness campaigns to ensure community buy-in and heighten the knowledge of waste management within their communities.
- Solutions to the problem associated with illegal dumping include the use of the Extended Public Works Programme for clean-ups, the strategic placements of mini drop-offs, municipalities allowing free disposal for smaller quantities, offering a discount for clean waste disposed for recycling and numerous well-placed drop-off facilities for ease of disposal, amongst others.
- Details on illegal dumping in the Western Cape is further discussed in “A Strategy to Reduce Illegal Dumping in the Western Cape Province”, currently in draft format for commenting.

3.2.5. Waste Minimisation

The NWMS, 2020 highlights waste minimisation as one of its key strategic pillars, with focus being placed on minimising the impact of waste and especially plastic packaging on our coasts, rivers, wetlands and our human settlement environments, by amongst others, diverting waste away from landfill; increasing re-use, recycling, recovery and alternative waste treatment; and maximising the role of the waste sector in the circular economy. The strategy further mentions two key focus areas namely waste prevention and managing waste as a resource (DEFF, 2020).

There are several drivers for waste re-use, recovery and recycling in the province, which includes:

- Limited landfill airspace
- Growing cost of landfilling
- Policy e.g. landfill disposal restrictions, EPR Regulations

Despite the above drivers, disposal is still largely favoured over other waste management methods. The diversion rates in the province are elaborated on in the following sections:

3.2.5.1. General Waste Diversion

During 2018, the waste diversion rate in the Western Cape was 28%. The diversion rate declined to 24% during 2021 (Figure 24). The West Coast District has led with diversion during the 2019-2021 period and the Central Karoo has consistently had the lowest diversion rates over the 2018-2021 period (Figure 25). It should be noted that the CoCT, as the largest generator of waste, diverted an average of 492 700 tonnes per year during the 2018-2021 period.

KEY INSIGHTS

- During the 2018-2021, the Western Cape has had an annual diversion rate between 22-28%. Municipalities in the West Coast District have made good progress in achieving waste diversion, whereas municipalities in the Garden Routes and Central Karoo districts continue to have low diversion rates.
- The province has relatively high diversion rates for C&D waste, which municipalities use for landfill cover. More needs to be done to ensure municipal waste diversion e.g. expansion of split-bag systems.
- Organic waste diversion is a key focus of the Department. The organic waste diversion target for the Western Cape is 50% diversion by 2022. The diversion rates for 2021 are as follows:
 - Western Cape : 24%
 - CoCT: 23%
 - West Coast: 38%
 - Overberg: 35%
 - Central Karoo: 1%
 - Garden Route: 7%
 - Cape Winelands: 30%

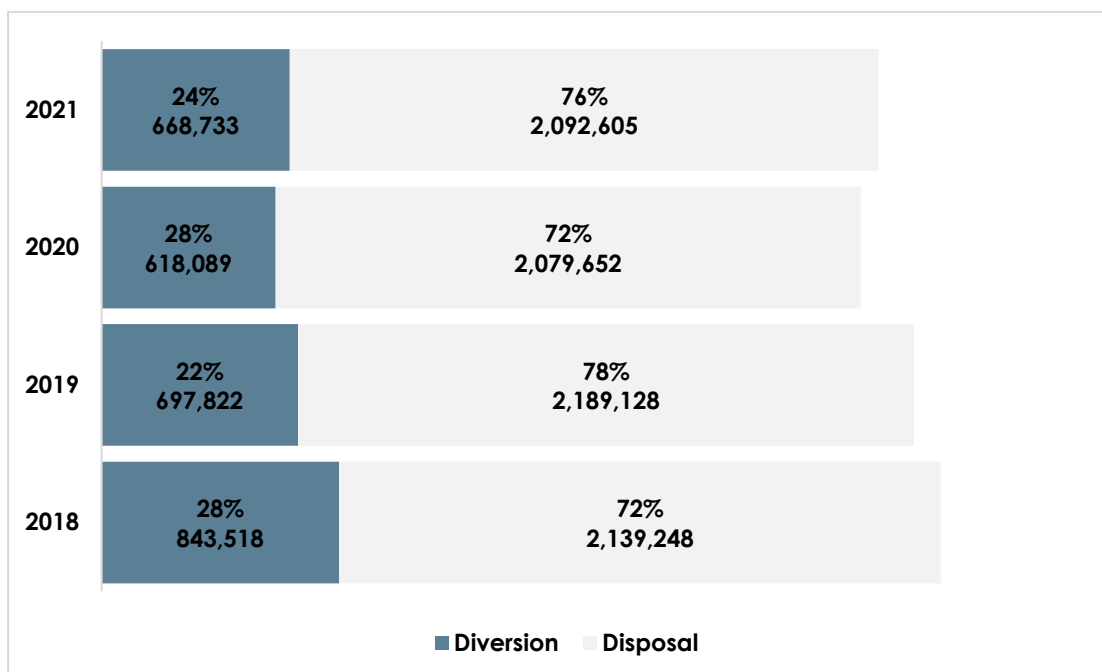


Figure 24: Waste diversion (percent and tonnes) in the Western Cape between 2018 -2021⁵

⁵ * During 2020, many recycling operations in the province and at municipalities were suspended during the COVID-19 lockdown Alert levels 4 and 5. This meant that no diversion of waste took place at municipalities and in the private sector as most people could not venture outside due to the social distancing requirements and various business operation restrictions. In many cases, large quantities of recyclable material were sent to WDFs and, in some instances, stockpiled. The lockdown also curtailed markets as processing operations were also prevented from operating. The impacts were subsequently very severe on the waste economy in the Western Cape resulting in job losses and income for recycling within the Small, Medium and Micro-Sized Enterprises (SMME's) and waste pickers.

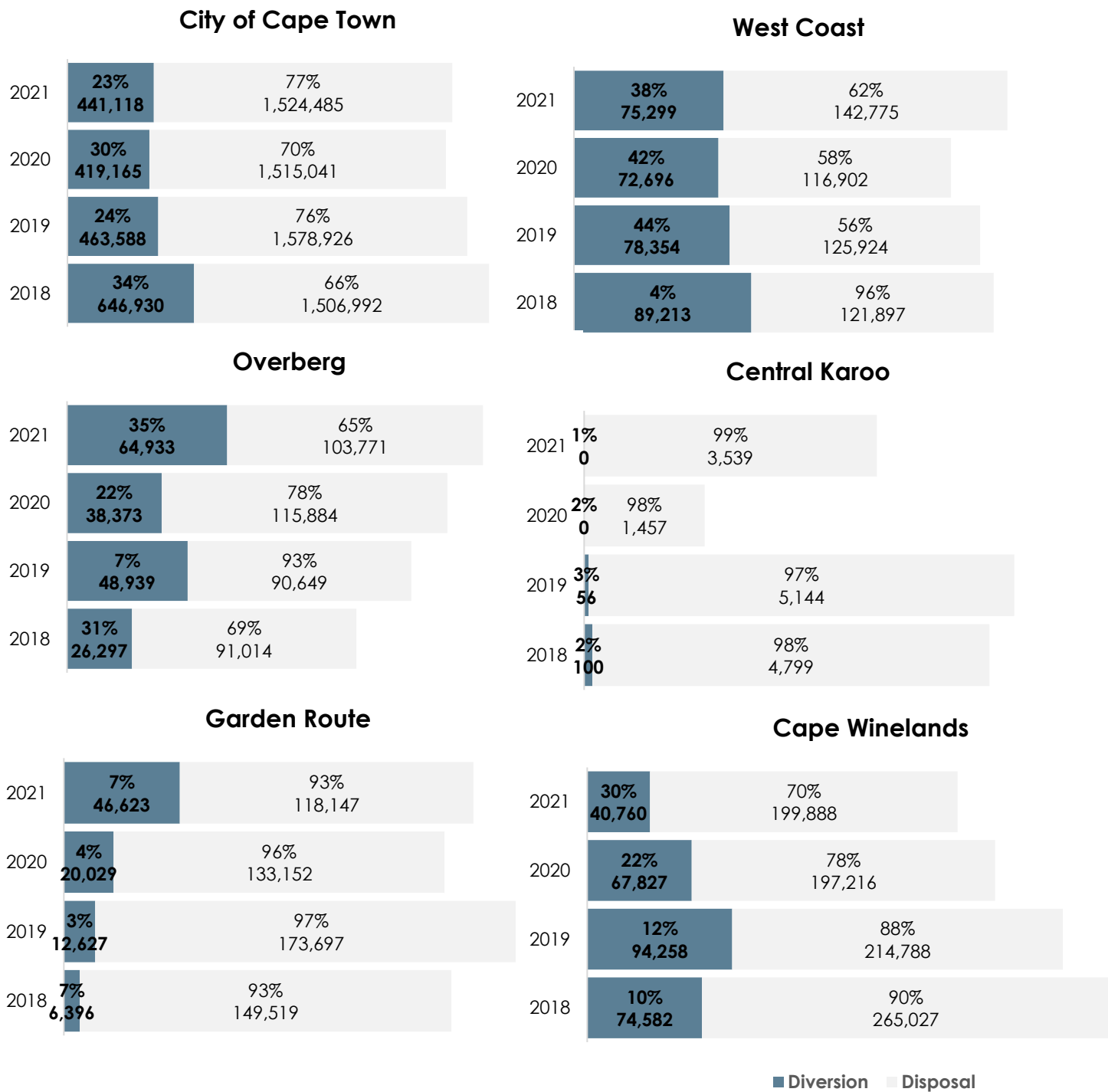


Figure 25: Waste diversion per District (percentage and tonnes) between 2018 -2021

Figure 26 indicates the proportion of each waste type diverted over the 2018-2021 period. C&D waste constituted the largest portion i.e. 44% of the waste diverted from landfill (by weight). For each waste type, the annual diversion rate is indicated in Figure 27. Organic waste and C&D waste have consistently shown high levels of diversion over the 2018-2021 period. Waste diversion for "other" waste has also been relatively high for the 2019-2021 period, however, "other" waste only contributed 4% of the total waste generated over the 2018-2021 period.

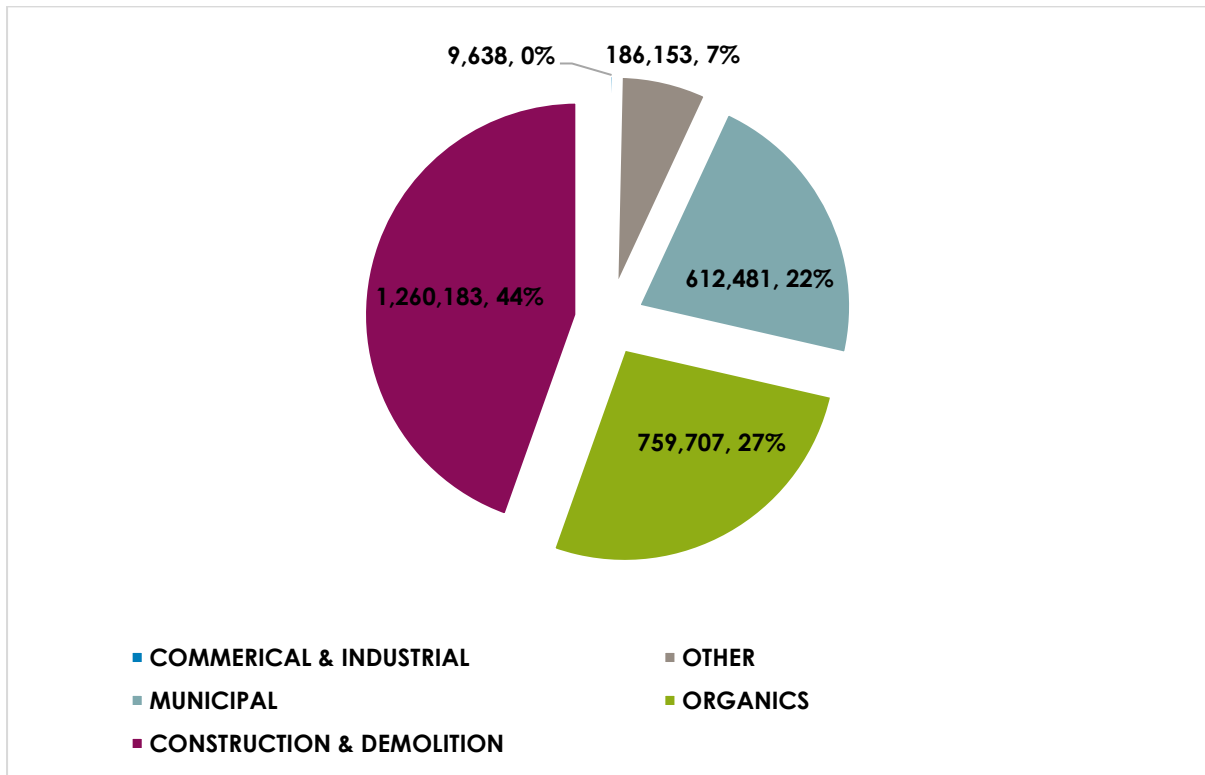


Figure 26: Proportion of waste diverted in the Western Cape per type (mass) between 2018-2021

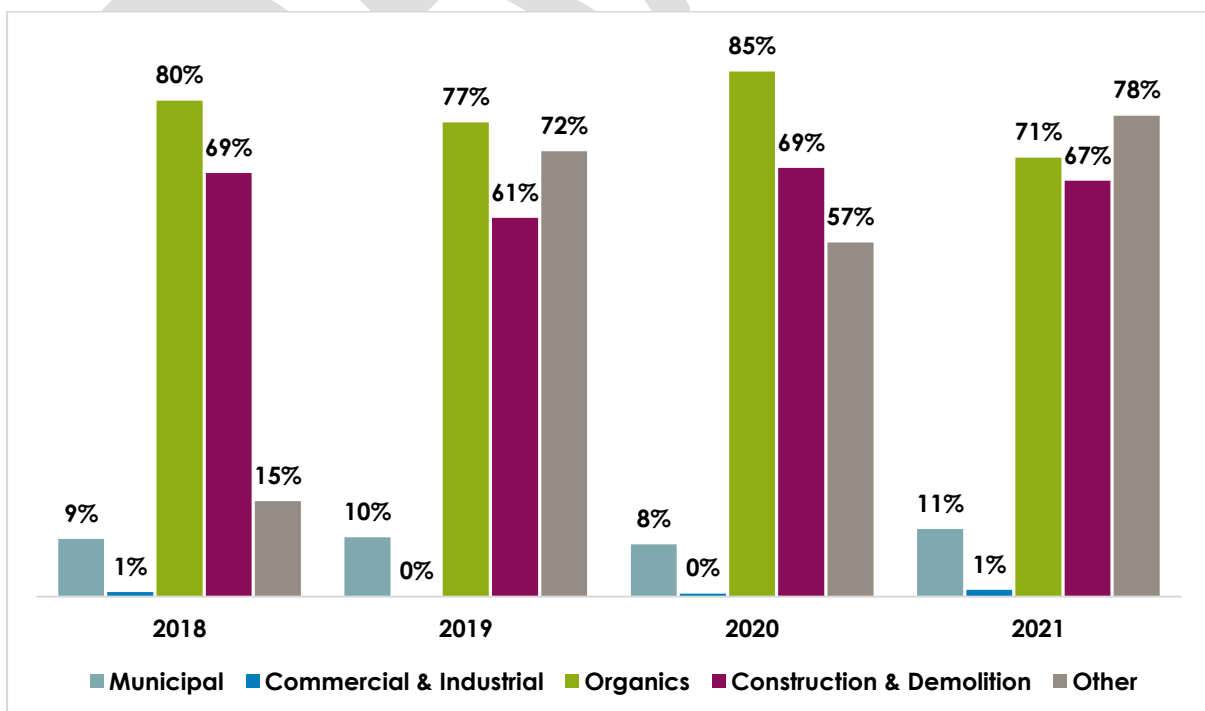


Figure 27: Waste diverted per stream during 2018-2021 (tonnes and percentage)

Organic Waste Diversion

The WC IWMP 2017-2022 indicated the following targets for organic waste diversion, which were subsequently included in WML conditions of facilities.

- 50% diversion by 2022
- 100% diversion by 2027

Figure 28 provides the annual waste diversion rate for organic waste per district. This only includes the green waste/garden waste portion of organic waste, which is reported by the facility and does not factor in the municipal portion of the waste, which also includes an organic waste portion comprising food waste and garden waste.

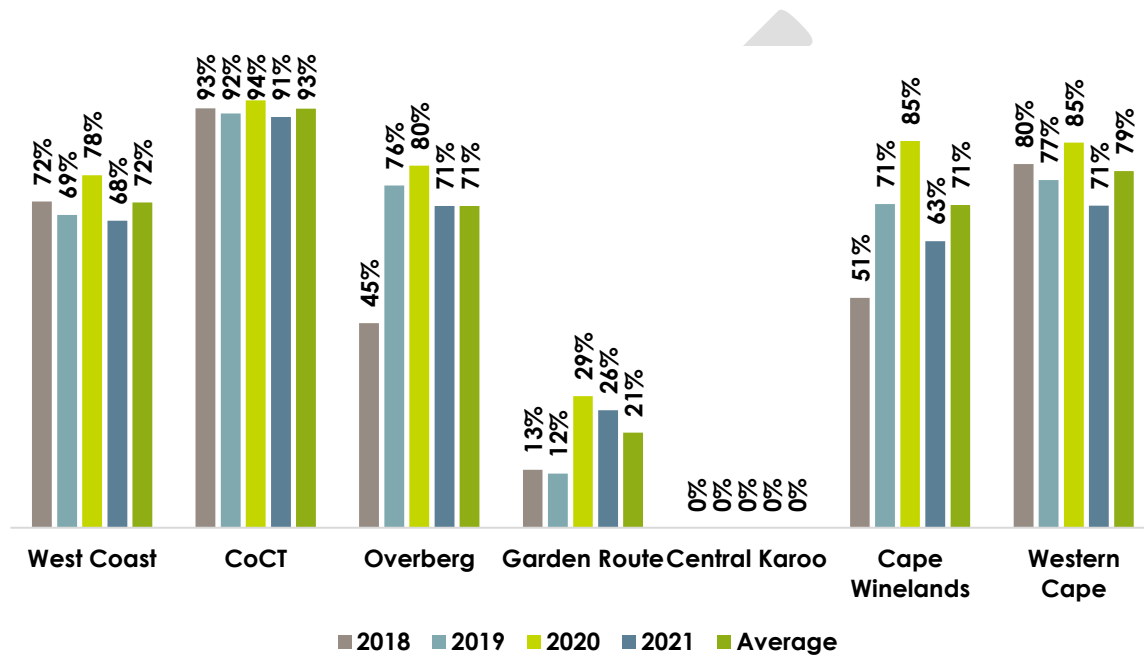


Figure 28: Organic waste diversion per district during 2018-2021 (no assumptions)

Figure 26, therefore makes no assumptions about the data, and only displays the data as it is reported to the IPWIS system. As indicated in Figure 28, the average overall organic waste diversion for the province was 79% over the 2018-2021 period. The CoCT has the highest levels of organic waste diversion, averaging at 93%. Since most facilities in the Central Karoo did not report to IPWIS, no organic waste diversion has been recorded for the district.

Figure 29 is based on Figure 28, however an assumption is made that 30% of the municipal waste disposed of is organic waste (mostly food waste) and therefore needs to be factored in when calculating the overall organic waste diversion rate to obtain a more accurate picture. This would mean a lower overall diversion rate for organic waste. The formula used to calculate organic waste diversion based on the 30% assumption is as follows:

$$(1) \text{ Total Organic Waste Generated} = \text{Disposed Organic waste reported on IPWIS} + \text{Diverted Organic Waste reported to IPWIS} + 30\% \text{ Municipal Waste Disposed}$$

$$(2) \text{ Total Organic Waste Diverted} = \text{Diverted Organic Waste reported to IPWIS} / \text{Total Organic waste Generated.}$$

As indicated in Figure 29, the average organic waste diversion for the Western Cape was 28% over the 2018-2022 period. The West Coast District has the highest average organic waste diversion at 48%.

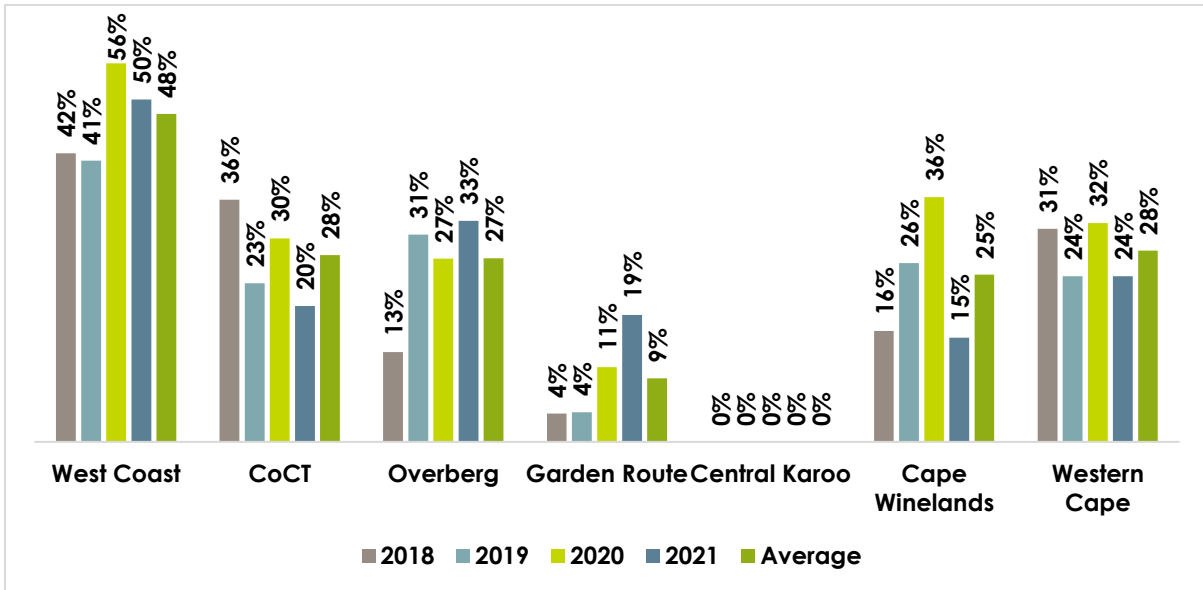


Figure 29: Organic waste diversion per district during 2018-2020 (with 30% assumption)

3.2.5.2. Hazardous Waste Diversion

Figure 30 shows the tonnes of hazardous waste diverted between 2018 and 2020. The major hazardous waste stream being recovered during that period was waste oils. It is evident that the amount of waste oils diverted increased between 2018 and 2019 but decreased in 2020. This decrease is likely due to the pandemic affecting business and industry operations. Liquid and organic sludge was diverted in small quantities during 2018-2020.

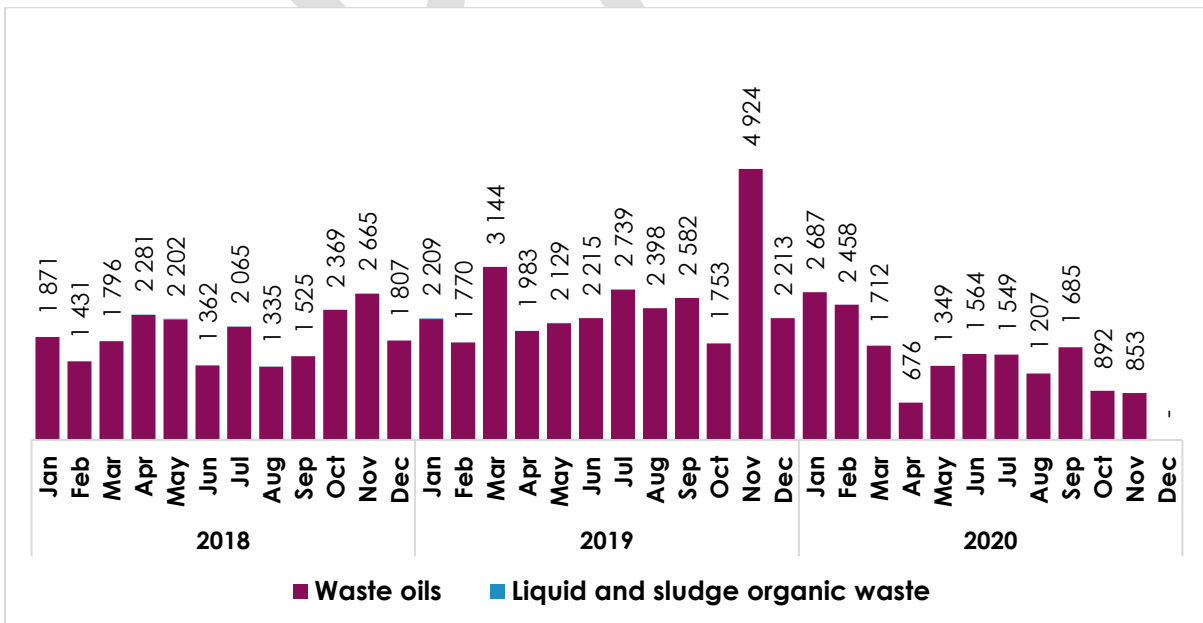


Figure 30: Hazardous waste diversion in the Western Cape between 2018-2020 (tonnes)

3.2.6. Waste Minimisation Initiatives to Support Diversion

Separation at source (s@s) is key to any waste recovery and recycling initiative. S@s is the practice of setting aside recoverable materials from non-recoverable waste materials at the point of generation to reduce the volume of waste being landfilled. This may include the use of a split bag system (e.g. a wet/dry two-bag system or 3-bag system) or other methods such as drop-offs, buy-back centres and swap shops). In promoting the then NWMS, 2011 Goal 1, Promotion of waste minimisation, reuse, recycling and the recovery of waste, the Department developed a Guide to Separation of Waste at Source aimed at municipalities. The guideline focuses on global and local initiatives, provides details on s@s systems, financing, and provides practical steps to consider when implementing an s@s programme. This report further critically evaluates opportunities for implementing practices, programmes and systems for s@s to improve diversion efforts. This was followed by hosting two workshops on the topic.

The Department has also undertaken several waste minimisation initiatives specifically aimed at providing waste minimisation training to a wide range of stakeholders including municipal officials and waste collection staff, Expanded Public Works Programme (EPWP) workers, private recyclers, and the youth working in waste management Figure 31. An overview of key waste minimisation training undertaken is shown in Figure 32.



Figure 31: Photograph showing Waste Minimisation training being undertaken by the Department

KEY INSIGHTS

- Separation of waste at source reduces the potential contamination of recyclables and is key to waste recycling and recovery initiatives.
- The Department, municipalities, industry, recyclers and the public all have a role to play in waste minimisation. Municipalities have developed various initiatives and infrastructure to support waste minimisation.
- Circular economy initiatives, such as the WISP programme, which utilises a resource efficiency approach, should be supported.
- EPR promotes waste minimisation initiatives by encouraging responsible products development and post-consumer waste recovery.

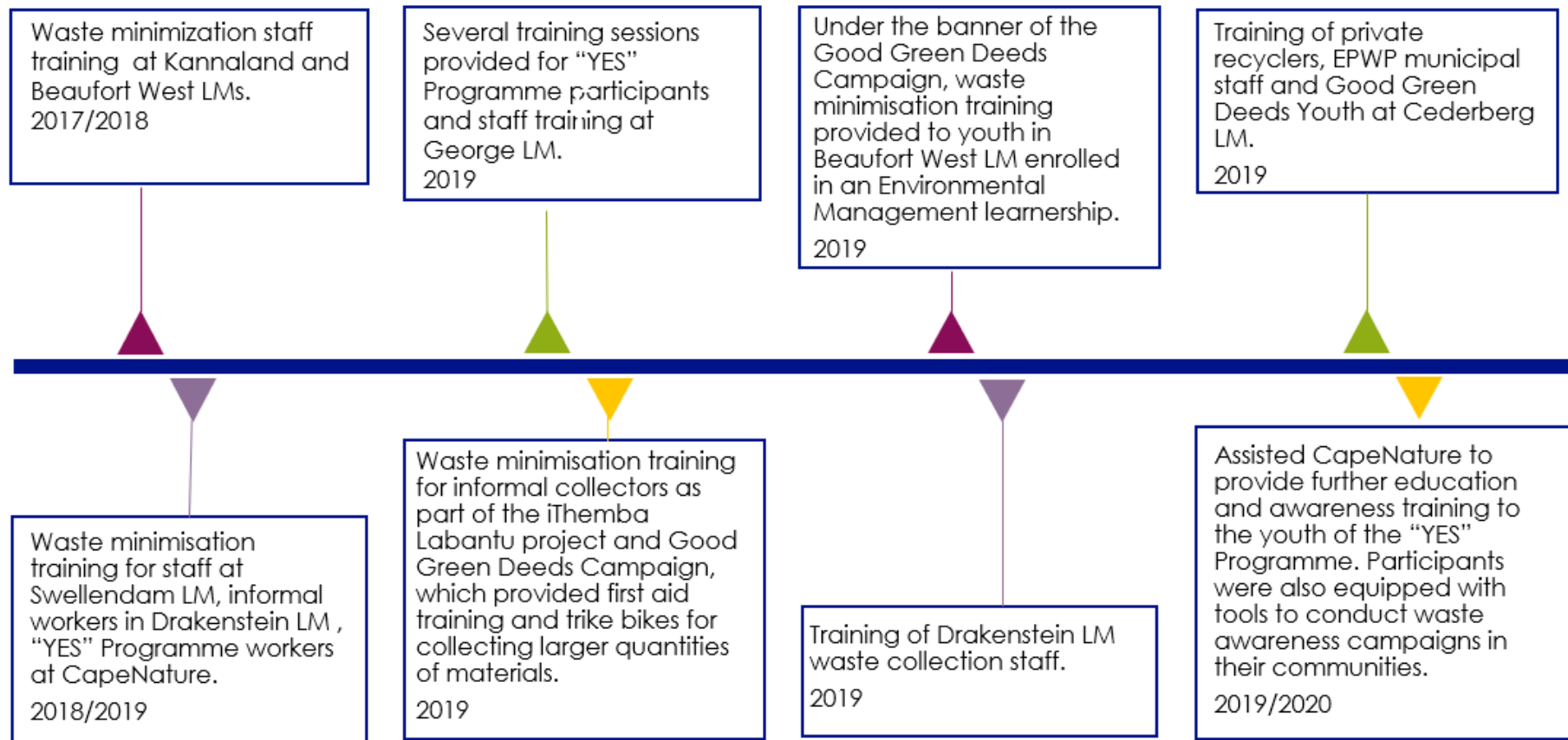


Figure 32: Departmental waste minimisation Initiatives undertaken

Municipalities have undertaken several waste minimisation initiatives aimed at waste reduction and waste separation. A summary of waste minimisation initiatives undertaken by municipalities during 2020 is included in Figure 33. As seen in Figure 33, municipalities within the Central Karoo District had either few or no waste minimisation initiatives. Other municipalities of concern, outside of the Central Karoo include Kannaland, Oudtshoorn and Cederberg municipalities. Also, of concern is that some municipalities lack waste minimisation initiatives for organic waste, despite the national and provincial landfill restrictions pertaining to this waste type.

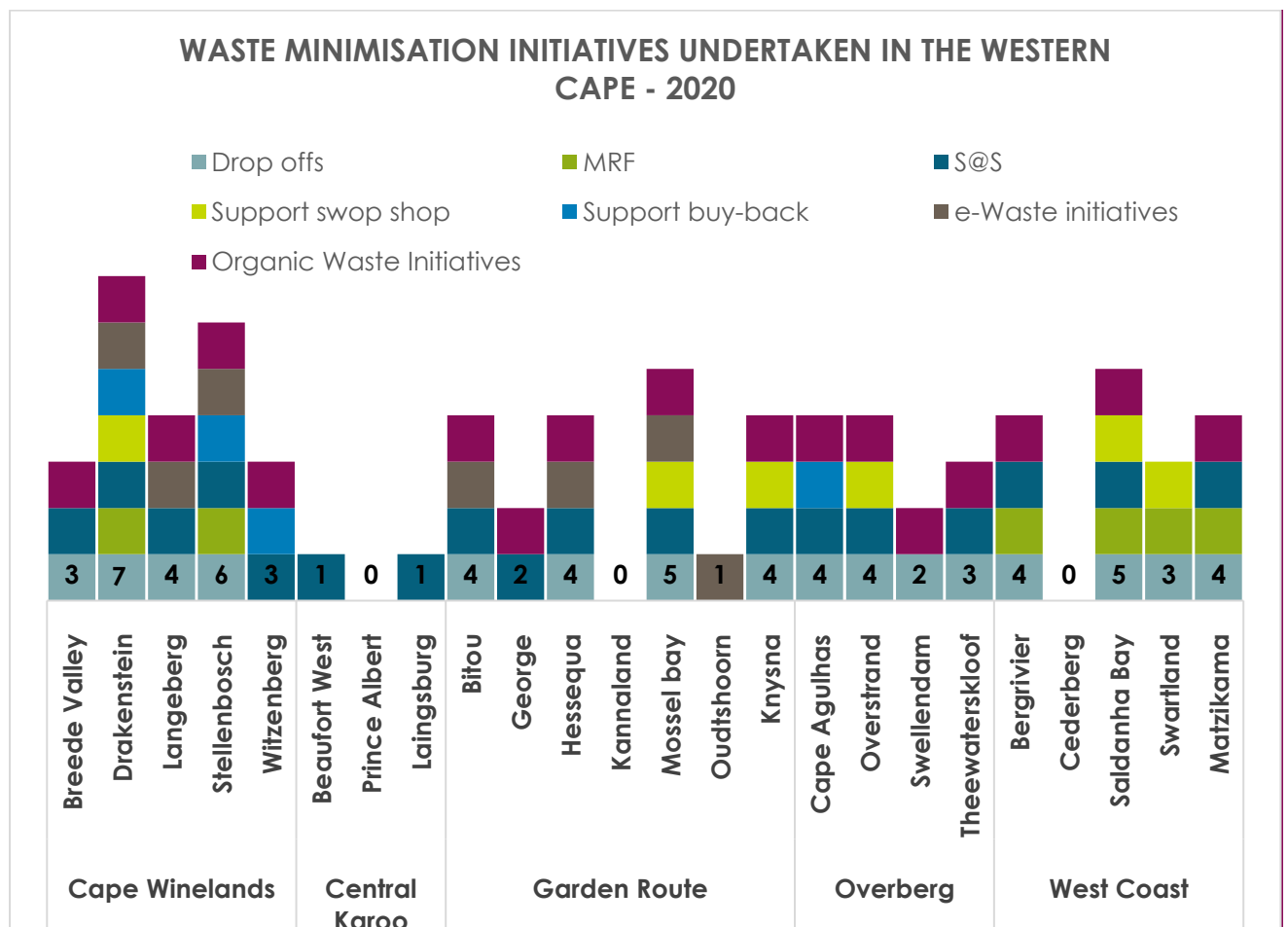


Figure 33: Waste minimisation initiatives undertaken by municipalities during 2020

3.2.6.1. Provincial Organic Waste-focussed Initiatives

Organic waste has been identified as a key waste type requiring intervention. Targeting organic waste has climate change benefits, since methane produced during the landfilling of organic waste has negative climate change impacts. Separation of organic waste from the rest of the waste stream, also result in the availability of cleaner recyclables. In addition to the above, food waste, is problematic since it represents wasted resources due to food loss and a lost opportunity for the beneficiation to those in need (DEA&DP, 2020).

The IWMP 2017 -2022 set diversion targets for organic waste, 50% diversion by 2022 and 100% diversion by 2027. The following measures to divert organic waste from landfill were undertaken by the Department.

- During 2019, the Department developed a Provincial Organic Waste Strategy for the diversion of organic waste to landfill. The vision of the strategy is to assist in the creation of a circular economy where organic waste is not wasted within the entire value chain and is instead largely prevented or beneficated to reduce the amounts going to landfill and the major impact on climate change.
- A Guide to Separation of Waste at Source as well as specific waste stream management guidelines i.e. green waste, abattoir waste and sewage sludge were drafted.
- The Department has ensured that the organic waste diversion targets were written into environmental authorisations. The Department has requested that municipalities submit Organic Waste Diversion Plans. The purpose of the organic waste targets and diversion plans are to reduce the cumulative environmental impacts caused by WDFs, among others, leachate generation impacting groundwater quality, the decomposition of organics causing methane generation and immediate explosion risks at waste facilities, and surrounding structures. These impacts can be reduced by diverting organic waste. Progress on Organic Waste Diversion Plans is indicated in Box 2.

Box 2: Progress on Organic Waste Diversion Plans

- Currently 10 local municipalities and the CoCT have submitted organic waste diversion plans to the Department for review. The plans have been reviewed by the Department and comments have been furnished to the various municipalities. The comments must be addressed in the final plans, prior to being tabled at municipal council and adopted for implementation. Monitoring and reporting on the progress of actions to divert organic waste must be undertaken to ensure implementation.
- It was observed that many plans lacked sufficient information regarding organic waste sources to establish a baseline. Many of the plans also lacked information on how to plan for the 50% diversion target by 2022. The technologies proposed to process diverted organic waste seemed appropriate. It must however be ensured that funds to support such infrastructure and for associated transportation costs, are set aside to ensure that implementation takes place. Newer and innovative technologies that become available need to be considered.
- The Department is still awaiting plans from several municipalities, The Department will continue to work with municipalities to ensure that good quality plans are drafted and implemented.

- Organic waste-focused workshops were held:
 - Hosted two workshops to promote the guideline for the management of Abattoir Waste in the West Coast District during 2017.
 - A Restriction and Prohibition of Organic Waste to Landfill in the Western Cape workshop was held on the 22 November 2019. The purpose of the workshop, which was hosted in the West Coast District, aimed to find a regional solution with all the organic waste generators, treaters and beneficiates in the area by means of an industrial symbiosis model. The industrial symbiosis model will allow synergies to be formed with organic waste generators, treaters and beneficiates in the District to better facilitate the diversion of organic waste from landfill.
 - Hosted two workshops on the development of generic Organic Waste Diversion Plans for municipalities in the Garden Route District (1 November 2018) and Cape Winelands District (14 February 2019). The workshops aided municipalities to develop a plan in working towards achieving these targets to divert and minimise organic waste from landfill by means of a roadmap.
 - Opportunities and solutions for managing food, green, abattoir and other organic waste in the Cape Winelands District: Finding a Regional Solution for Organic Waste Management, held online on the 28 October 2020.
 - A group session was held within the City of Cape Town to get feedback from stakeholders on what are the key challenges experienced by the abattoir sector and what role should government and private sector play in resolving the challenges.

3.2.6.2. Circular Economy Initiatives

- The Western Cape Industrial Symbiosis Programme (WISP)
 - The Department invites WISP representatives on an annual basis to its Industry Waste Management Forum to increase exposure of the programme to industry.
 - WISP is facilitated by GreenCape and funded by the CoCT. It is a resource efficiency approach whereby one company's unused or residual resources are used by another for mutual benefit, leading to a more resource efficient and lower carbon economy. WISP connects companies with unused or residual resources such as materials, energy, water, assets, logistics and expertise and offers free facilitation to business members to allow them to negotiate transactions
 - GreenCape reports that the cumulative impact of WISP over the last six years has been the following:
 - 104 900 tonnes of waste diverted from landfill;
 - 309 200 fossil GHG emissions saved (equivalent to the electrical usage of 39 800 households in SA);
 - Over R120 million generated in financial benefits (additional revenue, cost savings and private investments);
 - 69 permanent jobs in member companies, as well as 25 temporary positions, and 218 economy-wide jobs in supply chains have been created.

- Extended Producer Responsibility (EPR)
 - The EPR regulations were published by the DFFE in May 2021 and all EPR schemes were required to register with DFFE by 5 November 2021. The management of EPR schemes is a national competency and the province does not have any EPR-focused initiatives. The Department will however be working with municipalities to leverage support from its industry partners for its four waste integration projects. It is envisaged that the Producer Responsibility Organisations (PROs) will come on board and provide the necessary infrastructural requirements from the EPR Fees collected. Provinces will also be involved in compliance checks in partnership with National Government. Current challenges include: the existence of free riders; PROs not consulting with their members; late processing of proposed EPR fees; EPR fees not submitted; lack of applications and late registration.

DRAFT

3.2.7. Waste Management Infrastructure

3.2.7.1. Available Landfill Airspace

The limited landfill airspace in many local municipalities will more than likely result in increasing pressures for municipalities and see the movement of waste between them (GreenCape, 2020) e.g. Stellenbosch Municipality disposing of their waste at Vissershok WDF. Since many of the existing WDFs will run out of landfill airspace within the near future, municipalities will have to bear higher development and operational costs to increase available airspace. Figure 34 shows the estimated lifespan of the province's municipal landfills as of 2019, and the location of intended regional landfills (GreenCape, 2020). As seen in Figure 34, of the 25 local municipalities, 22 have less than five years left of available airspace.

Landfill airspace utilisation needs to be tracked regularly, to allow WDF managers to plan accordingly by ensuring that additional waste cells are constructed timeously. A Basic Assessment process in terms of the National Environmental Management Act 1998 (Act 107 of 1998), which could take more than six months, must be undertaken after submission of a WML application to the Competent Authority. The appointment of contractors for the construction of the new waste cells, the budgeting processes and Municipal Infrastructure Grant (MIG) applications also have time implications. This is important since, the planning and administrative timeframes have been underestimated in the past, which resulted in some municipalities having to resort to disposal of waste at facilities outside of the municipality. This has resulted in significantly more money being spent on hauling waste over longer distances and the need to increase the municipal waste disposal tariffs.

KEY INSIGHTS

- The need for available landfill airspace continues to be an issue in the province. Municipalities are required to plan accordingly to ensure funding is available to increase landfill airspace.
- Since municipalities often face financial constraints, many are hoping to realise the cost saving benefits of regionalisation of WMFs through economies of scale. Within all the districts, regional WMFs are being planned and are at various stages of planning.
- Compliance at current WDFs remains a challenge. Improvements are required at these facilities pertaining to access control and security, stormwater management, groundwater monitoring and lack of cover material and compaction.
- The cost for the closure and rehabilitation of WDFs is often significant for municipalities with limited budgets.

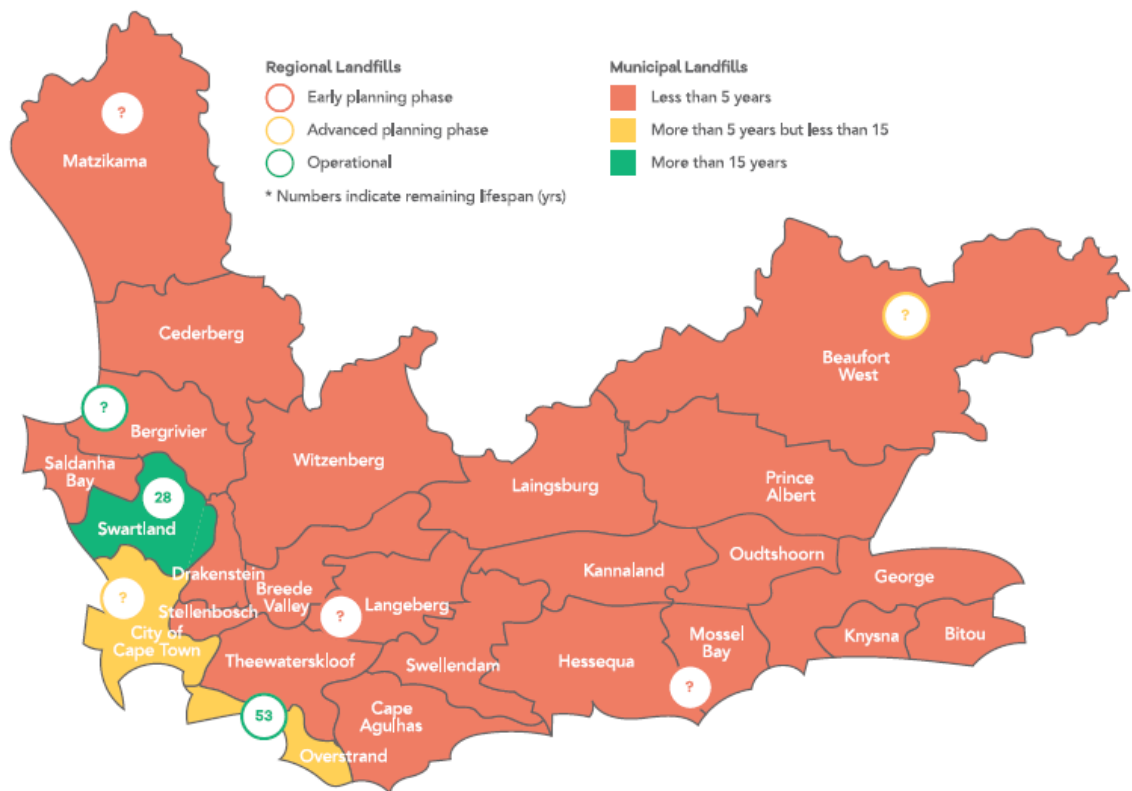


Figure 34: Estimated landfill airspace for each municipality in the Western Cape (GreenCape 2020)

A landfill airspace study undertaken by the Department during 2012 recommended that to keep a handle on the status quo at WDFs, airspace surveys need to be conducted every two to three years. Depending on the current airspace, a better extrapolation could occur for future WDF development and management.

The Department has implemented several methods to extend the lifespan of operating WDFs, to optimize the use of available airspace and increase diversion:

- The Landfill Airspace Determination Tool (Box 3),
- The Alternative Waste Management Tool,
- Organic Waste Diversion Plans,
- Wastepreneurs (waste entrepreneurs) SMME support programme,
- Authorizing landfill height extensions, and
- Waste stream guidelines.

Box 3: Purpose of the Landfill Airspace Determination Tool

The Department has developed a tool for landfill airspace management, aimed at WDF managers. This tool can be used to estimate the remaining lifespan of a waste cell based on the following:

- current rate of deposition (rate of waste disposal),
- waste characterisation data,
- waste growth rate or population growth rate,
- the approximate shape and volume of the waste cell volume,
- cover to refuse ratio,
- method of compaction,
- liner, and
- capping thicknesses.

The tool must be updated annually with topographical survey data and weighbridge data, so that the tool can display the waste growth rate and the remaining lifespan of the waste cell. Since many assumptions about landfill operations were made during the development of the tool, the calculations were designed to be conservative, to prevent scenarios of landfill airspace shortages. The Department has also been working on a guideline document for the technical use of this tool, which will be made available once finalised.

3.2.7.2. Number and Type of Waste Management Facilities

WMFs include e.g. WDFs, waste drop-offs, recycling and composting facilities (Table 8). There is limited waste management infrastructure at municipalities as per the Departmental Infrastructure Study developed in 2016. The privately owned WDFs in the province include PetroSA (Mossel Bay), PPC (De Hoek and Riebeek West), Exxaro (Vredenburg) and ArcelorMittal (Saldanha Bay). The Vissershok (Averda Enviroserv) Private WDF operates as a commercial landfill receiving waste from businesses and municipalities.

Table 8: Number and type of waste management facilities in the Western Cape

WASTE MANAGEMENT FACILITIES	COCT	OVERBERG	CAPE WINELANDS	WEST COAST	CENTRAL KAROO	GARDEN ROUTE	TOTAL
Operational WDFs	4	9	14	8	7	15	57
Decommissioned WDFs	23	20	16	34	1	15	109
Operational Drop-off facilities	19	8	5	12	0	0	44
Operational Transfer stations	1	4	4	2	0	0	11
Operational Materials recovery facilities	27	3	3	5	1	0	39
Operational Compost Facilities	3	1	2	0	0	0	6
Decommissioned & Operational WMFs	77	45	44	61	9	30	266

3.2.7.3. Regional Waste Management Facilities (WMFs)

The regionalisation of WMFs may provide a benefit to municipalities by providing cost savings through economies of scale. There are currently nine regional WMFs in various stages of operation/planning within the Western Cape:

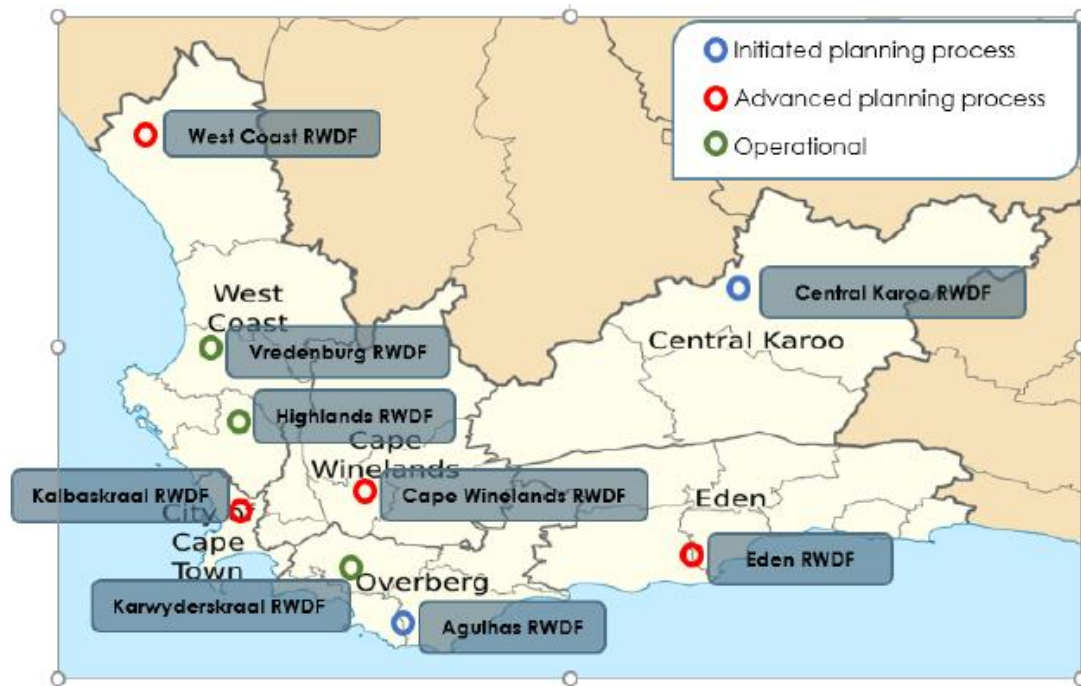


Figure 35: Regional waste management facilities in the Western Cape

The regional WMF sites for the West Coast District in Matzikama, Kalbaskraal in the CoCT, Cape Winelands District in Breede Valley, and the Garden Route District are at the advanced stages of planning.

Karwiderskraal WDF in the Overberg District is operating and receives waste from the local municipalities of Overstrand and Theewaterskloof, with the possibility of Swellendam and Cape Agulhas municipalities joining in future. This facility has capacity to service all the local municipalities in the ODM, but due to financial constraints at local municipalities, the shift to direct waste by road transport to this regional waste facility has been delayed.

The Vredenburg WDF in Saldanha Bay Municipality and Highlands WDF in Swartland Municipality are operational and are receiving waste from the Bergrivier Municipality. The Central Karoo District is planning a regional WDF and progress on this facility are in the initial stages of planning.

3.2.7.4. Conditions at Waste Management Facilities

The conditions at the WMFs generally fluctuate. Some of the key issues experienced at WMFs are summarised below:

ISSUES	IMPACTS
Broken perimeter fences	<ul style="list-style-type: none"> ● Unauthorized waste pickers enter the grounds of the facility and trespass on the waste body. ● Spread of windblown litter. ● Facility footprint creep which results in illegal disposal of waste outside of the permitted perimeter.
Lack of stormwater management channels (Recent audits conducted has indicated that the water management at many facilities have improved.)	<ul style="list-style-type: none"> ● Stormwater becomes contaminated when encountering the waste body. ● Contaminated stormwater not contained within the footprint of the facility.
The lack of cover material.	<ul style="list-style-type: none"> ● Disposed waste becomes windblown causing numerous nuisances such as blocked/clogged sewage and water channelling systems. ● Aesthetic nuisances at most WDFs.
Access control at facilities are lacking	<ul style="list-style-type: none"> ● Volumes of incoming waste, and the checking of the waste entering the landfill are also lacking at many at WMFs.
Lack of groundwater monitoring at facilities	<ul style="list-style-type: none"> ● If water quality is not monitored, it could create conditions which could lead to significant and prolonged environmental impacts.
Detection of landfill gas (Box 4)	<ul style="list-style-type: none"> ● Methane gas detected above range at some facilities. Unless captured by a gas recovery system, methane generated by the WDF is emitted directly through the landfill cover surface. ● At facilities where the percentage methane is above 5% at any monitoring point, there is a risk of explosion and fire. Sources of ignition should be avoided, such as smoking or fires at the landfill. Municipalities should also check for the ingress of water at the affected facility, as organic waste that breaks down in anaerobic conditions produces methane.

Issues highlighted at WDFs during Departmental audits are requested to be addressed by municipalities in their Action Plans. Due to the lack of consistency from municipalities in supplying these plans to the Department, an additional administrative step which automatically leads to further environmental law enforcement action has been implemented.

Box 4: Landfill Gas Detection

The main components of landfill gas are CO₂ and CH₄. CH₄ is a colourless, odourless asphyxiant, flammable, gas that is lighter than air with a vapour density of 0.6. CH₄ is explosive between the concentrations of 5% - 15% by volume in air. This concentration range is referred to as the explosive range with the two extremes being referred to as the lower (LEL) and upper (UEL) explosive limits respectively.

Method Used for the Landfill Gas Detection Exercise

Measuring points are selected in and around the waste body for the measurement of CH₄ concentrations. The Department normally tries to measure four points on the waste body. The measuring points are determined by establishing where older waste was disposed of, particularly in areas where the decomposition of the solid waste has already begun. These points are also identified by observing obvious possible pathways for the gas to be released from the waste body such as cracks or eroded areas. At each measuring point a hole is dug with a spade up to a depth of not more than 150mm or where the waste body allows, depending on the thickness and hardness of the surface.

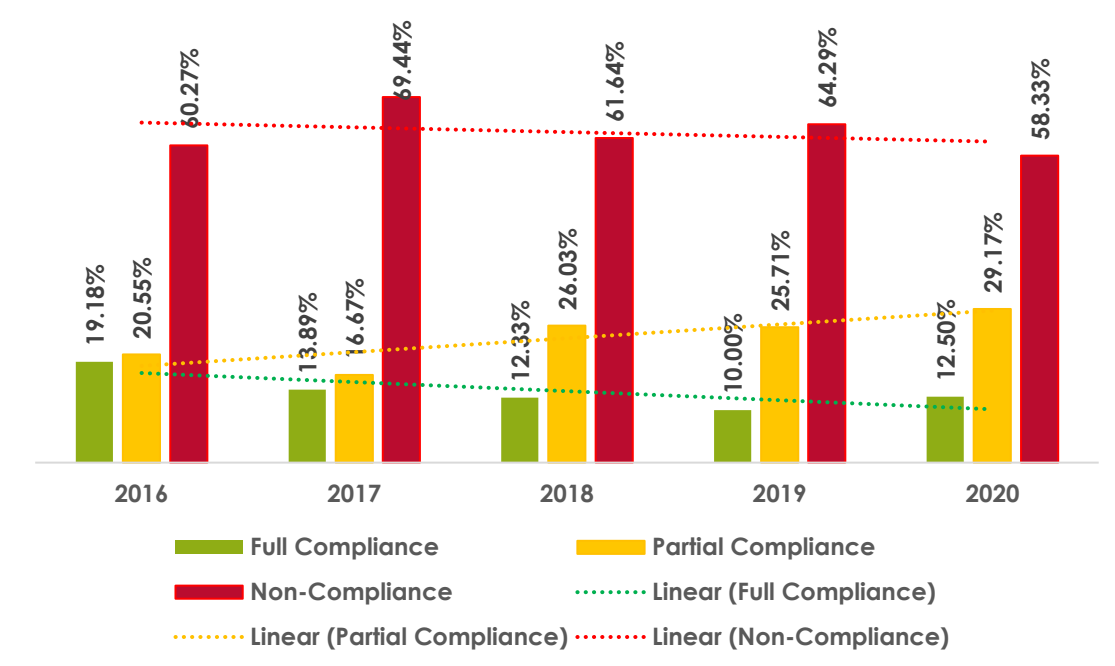
The measuring probe is lowered into the hole for detection of gas. The concentration of O₂ by volume of air (%), along with the value of the CO₂, hydrogen sulphide (H₂S) (ppm) and CH₄ (% volume in this case), as detected by the device, is recorded.

At facilities where the percentage methane is above 5% at any monitoring point, there is a risk of explosion and fire. Sources of ignition should be avoided, such as smoking or fires at the landfill. Municipalities must also check for the ingress of water at the affected facility, as this facilitates the decomposition process, resulting in methane production from the anaerobic decomposition of the organic waste stream.

3.2.7.5. Compliance at Waste Disposal Facilities

The Department undertakes routine audits at various WDFs to determine the level of compliance with WML conditions. From the compliance audits conducted during the period 2016 to 2020 (Figure 36) the observations are:

- The rate of non-compliance has moved towards a downward trend.
- There is an observed relationship between the downward trend of full compliance and the upward trend of partial compliance. Some facilities that were compliant, became partially compliant.



COMPLIANCE RATING	STATUS INDICATOR (X)	REQUIRED ACTION
$84.5 \leq X \leq 100\%$	Compliant (Green)	Minor Improvements
$64.5\% \leq X < 84.5\%$	Partially Compliant (Amber)	Improvements
$X < 64.5\%$	Non-Compliant (Red)	Major Improvements

Figure 36: Compliance at Waste Management facilities in the Western Cape (2016-2020)

During 2018, WMLs were varied to streamline operations and add more restrictions to outdated methodologies conducted by municipalities and which were permitted in the older permits and WMLs. Box 5 provides an overview of WDF height restrictions.

A weighted compliance monitoring methodology, which highlights environmental negligence, was implemented in 2020. This weighted auditing system was implemented during 2020 and this coincided with the COVID-19 pandemic restrictions. The constraints associated with the pandemic restricted the financial and human resources of most of these municipalities. The lack of funds and human capital to deploy caused a decline in the rate of compliance. The awareness created by the highlighted environmental negligence may create an improvement in compliance at these municipalities over time. Only a few Action Plans have been submitted to the Department during this period, the Department needs to encourage the municipalities to submit these plans.

Box 5: Waste Disposal Facility Height Restrictions

Many WDFs in the province were established through the historical unsanitary landfill methodology and approach, meaning that they had no containment barriers or liners to protect the groundwater resources. Those WDFs had very little consideration of modern engineering construction and design, the sites were managed by imposing suitable height restrictions that allowed for the disposal of waste over a period of between 10 to 20 years. From Departmental audits conducted and external audit reports it has been determined that some of these WDFs are well operated and have high ratings in relation to compliance with permit or licence conditions. WDFs in some municipalities were often restricted to very low heights of final disposal i.e. 1 or 2 metres, which was intended for the construction of a boundary berm used for controlled burning of waste. The burning of waste at WDFs is no longer allowed. The low height restrictions have become impractical due to the waste burning prohibition, which forced WDF managers to only dispose of waste at WDFs having low height restrictions imposed.

Some WDFs are non-compliant due to being over the permitted height prescribed in permits or licences and this is associated with the reasons why some of these WDFs have low levels of compliance. These WDFs have untapped airspace and could be utilized by the WDFs owners, who may consider applying for an increase in the operational heights which can be extended from 1 or 2 metres above natural ground level to between 5 and 10 metres above natural ground level. These applications could be made by the respective licence holders in consultation with professional civil engineers, the Department, as well as the Department of Water and Sanitation. The licence holder will then have the benefit of having increased WDF lifespan.

3.2.7.6. Closure and Rehabilitation of Waste Disposal Facilities

Compliance with legislative requirements as written into the records of decision and environmental authorisations of WDFs are very cost restrictive and requires a large capital investment. The rehabilitation of landfills requires adequate financial planning and allocation of funds. The challenge is that while closing and rehabilitating a landfill, municipalities are required to simultaneously procure new landfill airspace. Historic WDFs do not necessarily require costly landfill caps, however this needs to be determined by the Department of Water and Sanitation. Depending on the detail of the associated specialist studies, the appropriate capping can be provided for the site, smaller builders' rubble sites may pose less of a risk to the environment and the associated costs of closure may be significantly less than the associated costs of a larger landfill. The aim of the capping and closure is to ensure that the historic site no longer significantly pollutes the environment, and the organic waste which would have potential to pollute has already been decomposed. There is a great need for cost-effective and safe waste disposal. The limited budgets of municipalities mean that securing landfill airspace is prioritised over capping older WDFs.

3.2.8. Waste Planning and Institutional Arrangements

3.2.8.1. Institutional Framework of the Waste Sector

The Constitution highlights cooperative governance where the different spheres of government, although distinct, must work together in an interdependent and interrelated manner. Schedule 4 of the Constitution lists the areas where national and provincial government share concurrent national and provincial legislative competence. The environment is one of the concurrent competences of both national and provincial government. The provincial powers of 'supervision', 'monitoring' and 'support' of local government are derived from section 41, 139 and 154 of the Constitution.

- To facilitate effective communication between WMOs, Integrated WMOs Forums were established at various levels of government i.e. national, provincial (Variable 1) (Figure 37) and district level. The Central Karoo District Municipality does not have a WMOs' Forum but has established an environmental forum, which deals with broader issues relating to environmental matters including, waste.
- The WCG, together with municipalities, have several key strategic and technical engagements relating to planning, budgeting and governance. The provincial and municipal engagements, where strategic discussions take place (Variable 2), together with the WMOs forums provide input to and receive information from National MINMEC, MINTECH (Variable 3) and Working Group 8.
- Other important DEA&DP forums, which provide a platform for industry, are the Industry Forum and the Recycling Action Group (Variable 4).
- Important forums particularly pertaining to municipalities include the South African Local Government Association Municipal Infrastructure Forum and the Department of Local Government Municipal Infrastructure Grant forum. Other key government departments, municipal representatives, NGOs and industry bodies are also invited as stakeholders to attend and participate at these various governance platforms.

KEY INSIGHTS

- Half of the municipalities in the province have IWMPs, which are endorsed by the MEC. All municipalities must ensure that they have IWMPs in place to optimise and prioritise waste management. Implementation of activities must be monitored.
- Currently, 48% of local municipalities either have no integrated waste management by-law or their by-law is not aligned to the NEM: WA. These municipalities are encouraged to utilise the Department's Model Integrated Waste By-law when drafting or revising their by-laws.
- Most municipalities have designated WMOs to oversee waste management. Municipalities are required to designate WMOs to comply with the NEM: WA.
- Municipalities may benefit from regional co-operation by improving waste management services and reducing costs.

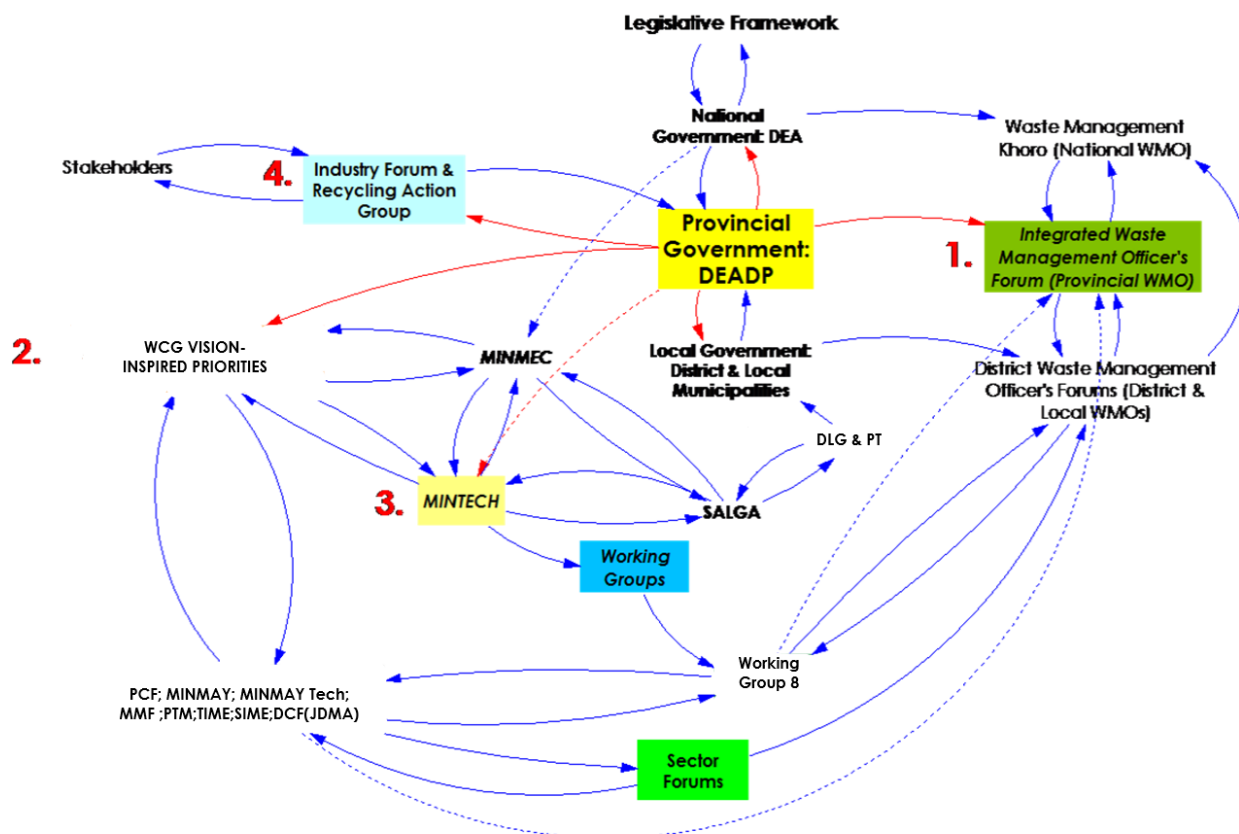


Figure 37: Institutional Framework for the Waste Sector

3.2.8.2. Integrated Waste Management Plan Status

The NEM: WA requires that provincial government and municipalities develop IWMPs and that these plans are endorsed by the relevant National Minister or provincial MEC, respectively.

Approximately half of municipalities in the province have IWMPs which are endorsed. Municipalities within the Central Karoo District are being assisted by the DFFE with funding to develop their IWMPs. Challenges include that some municipalities have outdated IWMPs, which must be reviewed to ensure that they are still relevant. A further challenge is that there needs to be improved monitoring and reporting of the implementation plan to ensure that planned activities are implemented.

TOTAL NUMBER MUNICIPALITIES	30
Municipalities with updated IWMPs	21
Municipalities with endorsed IWMPs	15

3.2.8.3. Integrated Waste Management By-laws

During 2017/18, municipalities were contacted to establish the status of integrated waste management by-laws. It was found that 20 of the 25 local municipalities had waste management by-laws. Many of the by-laws were however not aligned to the NEM:WA. This status quo of waste management by-laws in the province prompted the Department to develop a Model Integrated Waste By-law. The aim of the Model By-law was to ensure that regulatory requirements for waste management does not hamper economic development and that municipal by-laws are aligned with the current national legislation. The Model By-law was finalised and vetted during early 2020. It was distributed to all mayors, municipal managers

and waste managers for their consideration. With the assistance of the Department of Local Government, municipalities with no by-laws were offered assistance in drafting their new by-law, accepting either in part or in full. As a result, the following is reported:

- During 2021, Cederberg Municipality's Council accepted and approved the Model By-law in full to align their By-law to the NEM:WA.
- Stellenbosch Municipality's Council approved their By-law in 2021.
- Overstrand Municipality's Council approved their updated By-law in 2021.
- Currently, 48% of local municipalities either have no integrated waste management by-law or their by-law is not aligned to the NEM:WA. Further attention and liaison need to take place with those municipalities who do not have any by-laws. The Department will identify the necessary assistance and support that is required to initiate the process. Continued support is currently provided to Langeberg, Swellendam, Prince Albert and Matzikama.

3.2.8.4. Waste Management Officer Status

The designation, in writing, of waste management officers (WMOs) is a requirement of the NEM:WA. WMOs are responsible for coordinating waste management within their municipalities. To improve the governance of waste management in the province, the Department maintains regular contact with WMOs e.g. through the establishment of a Provincial Waste Management Officers' Forum (WMOF) where feedback is provided on the issues emanating from the various District Waste Management Officer Forums. Currently, 26 of the 30 municipalities have designated WMOs; 88% are men and 12% are women Table 9.

Table 9: Number of municipalities with designated waste management officers

DESIGNATED WASTE MANAGEMENT OFFICERS	NUMBER	PERCENTAGE
Municipalities with designated WMOs	26	87%
Municipalities without designated WMOs	4	13%
Female designated WMOs	3	12%
Male designated WMOs	23	88%

The provincial designated WMO is Mr Saliem Haider, Director: Waste Management, Department of Environmental Affairs and Development Planning.

3.2.8.5. Regional Cooperation Amongst Municipalities

Regional cooperation is a concept that has flowed from regionalisation and encompasses not only shared waste management infrastructure but also other aspects necessary for the efficient and effective provision of waste management services within municipalities. These aspects include, but are not limited to, vehicles needed for the provision of waste collection and disposal services and expertise in certain aspects of waste management. The potential benefits of following regional cooperation approach includes improved waste management services, reduced capital and operational costs and improved overall compliance. Box 6 and 7 provide examples of regional cooperation undertaken by municipalities.

Box 6: Regional cooperation example 1: Bergrivier and Saldanha Bay municipalities

Since Bergrivier Municipality does not have an operational WDF, they have a formal agreement in place with Saldanha Bay Municipality to utilise the Vredenburg WDF. Bergrivier Municipality was forced to follow this process as the transport costs to Vissershok WDF was significant and they had also run out of landfill airspace. It was also not feasible to construct their own landfill site. Saldanha Bay Municipality went through a legal opinion process which covered their constitutional requirements, the requirements pertained in section 84 (1)(e) of the Municipal Structure Act, Act 117 of 1998 as well as their own Waste By-law. The outcome of the legal opinion was positive in that there was nothing legally that could prevent Saldanha Bay Municipality from accepting waste from Bergrivier Municipality. The agreement was formalised through a service level agreement with council approval. Bergrivier Municipality would have to adhere to the requirements stipulated in the service level agreement. This assists Saldanha Bay Municipality with cost recovery associated with operating and managing the WDF and reduces the cost for Bergrivier Municipality in terms of having to construct a new landfill.

Box 7: Regional cooperation example 2: Overberg District Municipality

The Overberg District Municipality, with the development of the regional waste disposal facility at Karwyderskraal facilitated regional cooperation between municipalities and the District for the shared use of the facility. The establishment of the District Waste Management Officer's Forum further helped cement and enhance the cooperation among all parties. The District has also highlighted the importance of cooperation on a senior level where municipal managers engage and foster mutual understanding and agreement. The District is currently holding discussion with Swellendam and Cape Agulhas Municipalities to determine the best way of dealing with the disposal of their general household waste at the regional waste disposal facility.



Source: Overberg District Municipality

3.2.8.6. Capacity Building Initiatives

The Department recognises the importance of engaging with and building capacity of various stakeholders during workshops and forums. The Directorate: Waste Management regularly holds capacity building workshops with municipalities to assist waste managers and operators on an individual level where required.

Table 10: Capacity Building Initiatives Aimed at Municipalities

CAPACITY – BUILDING INITIATIVES	AIM/OBJECTIVES
Alternative Waste Management Technologies Tool Workshops for municipal landfill managers.	Municipalities gain an improved understanding on how to utilise the Alternative Waste Management tool and have become aware about the need to recycle waste.
Departmental Waste Forum for municipal waste managers and independent private sector consultants.	Networking and best practice waste information sharing.
Landfill Airspace Management Tool Workshops for municipal landfill managers.	Municipalities gain an improved understanding on how to utilise the Landfill Airspace Management Tool and have become more aware of the process to procure landfill airspace.
Compliance Analysis Tool Workshops for municipal landfill managers and independent private sector consultants	Ensured that the municipalities are using the tool to improve the compliance rates at the facilities and the awareness raising of the tools has resulted in more municipalities striving towards compliance.
Strategy to reduce illegal dumping (STRID) Workshop for municipal waste managers.	A draft strategy document will be shared with municipalities to create more awareness on the management of illegal dumping.
A waste awareness strategy was developed.	To provide municipalities with various means of communicating with their communities and stakeholders. These ranged from a variety of initiatives and was followed up with workshops held 6 September 2018. The strategy has been shared widely, and some municipalities have included it or sections of it to their IWMPs.
Integrated Waste Management Capacity-building Workshops for Municipal Managers and municipal waste managers.	To build and strengthen integrated waste management capacity among municipal waste management officers and other municipal officials.
Waste characterisation training provided to municipal staff and EPWP workers. A Waste Characterisation Guideline for municipalities was also developed.	Provide training on how to plan, conduct and analyse data when undertaking waste characterisation studies. This will ultimately assist municipalities to save costs by doing these studies themselves, instead of paying consultants to do it. Waste characterisation information is essential for municipalities to understand the types of waste being generated and plan accordingly. Waste characterisation data must be included in municipal IWMPs.

<p>IPWIS capacity- building workshops</p> <p>(Most of the attendees are those who requested training or those who wanted their new staff to be trained but also where a particular identified sector needed to be trained, based on the amount of erroneous data being submitted)</p>	<p>The IPWIS Capacity workshops focused on the IPWIS registration and waste reporting. The aim of the training sessions is to assist organisation in improving waste reporting/ accuracy of waste reporting to IPWIS and ensures the facilities are compliant.</p>
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3.2.9. Waste Management Costs

3.2.9.1. Provincial Government

The Directorate: Waste Management performs the waste management function of the Department. Some of the key areas of the Directorate: Waste Management includes giving effect to legislation, policies, norms and standards, guidelines, regulations and systems which support communities, municipalities, industry and the private sector, through the implementation of project-directed measures and initiatives. The main purpose is to improve integrated waste management in the Western Cape. The total costs associated with performing waste management functions have increased annually and are provided in Figure 38. A further breakdown of the budget and expenditure is provided in Table 11, which indicates that the budget and expenditure for goods and services has declined over the 2019/20 to 2021/22 period, making it difficult to fund projects.

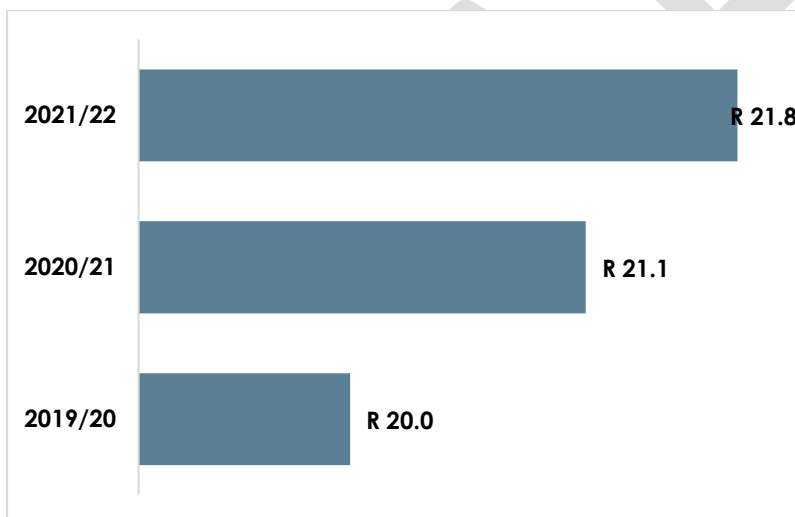


Figure 38: Directorate: Waste Management costs 2019/20- 2021/22 (millions)

KEY INSIGHTS

- The provincial waste management budget for goods and services has decreased over the three years making it difficult to fund prospective projects. The decrease also limits travel making it difficult to conduct compliance monitoring at municipalities. The decrease in budgets was due to funds being reallocated towards COVID-19 relief measures
- Waste management infrastructure has been identified as a key need to support waste management initiatives in municipalities. Many municipalities have, however, spent limited funds on capital expenditure projects. Municipalities need to source additional funding/ prioritise funds to ensure that the necessary waste management infrastructure is developed.

Table 11: Budget and expenditure for the Directorate: Waste Management 2019/20 to 2021/22

	2019/20		2020/21		2021/22	
	Adjusted Budget (R)	Expenditure (R)	Adjusted Budget (R)	Expenditure (R)	Adjusted Budget (R)	Expenditure (R)
Cost of Employment	18 423 627.00	18 345 964.95	19 621 711.00	19 621 479.27	20 623 003.00	20 557 153.94
Goods & Services	1 752 292.00	1 301 807.16	1 428 929.00	1 428 853.71	927 216.00	964 142.80
Departmental Agencies		402.44	450.00	449.33	470.00	1 036.14
Households	74 734.00	74 317.66			244 000.00	243 969.63
Capital	271 349.00	271 158.58	53 999.00	53 998.98	56 000.00	51 957.00
Payments for financial assets	1 481.00	1 273.39				
	20 523 483.00	19 994 924.18	21 105 089.00	21 104 781.29	21 850 689.00	21 818 259.51

3.2.9.2. Municipal

● Revenue

Municipalities generate income from a variety of sources. According to StatsSA (2021), the two main sources of revenue include:

- Municipalities actively generate their own income via e.g. property taxes, service charges, traffic fines.
- Municipalities receive funding from either government grants and subsidies or public donations and contributions.

Figure 39 provides an overview of the combined waste management revenue received for each district for the 2018/19-2020/21 period. Due to its higher population and waste management services provided, the CoCT has the highest revenue generated, by far, of all the other districts within the Province.

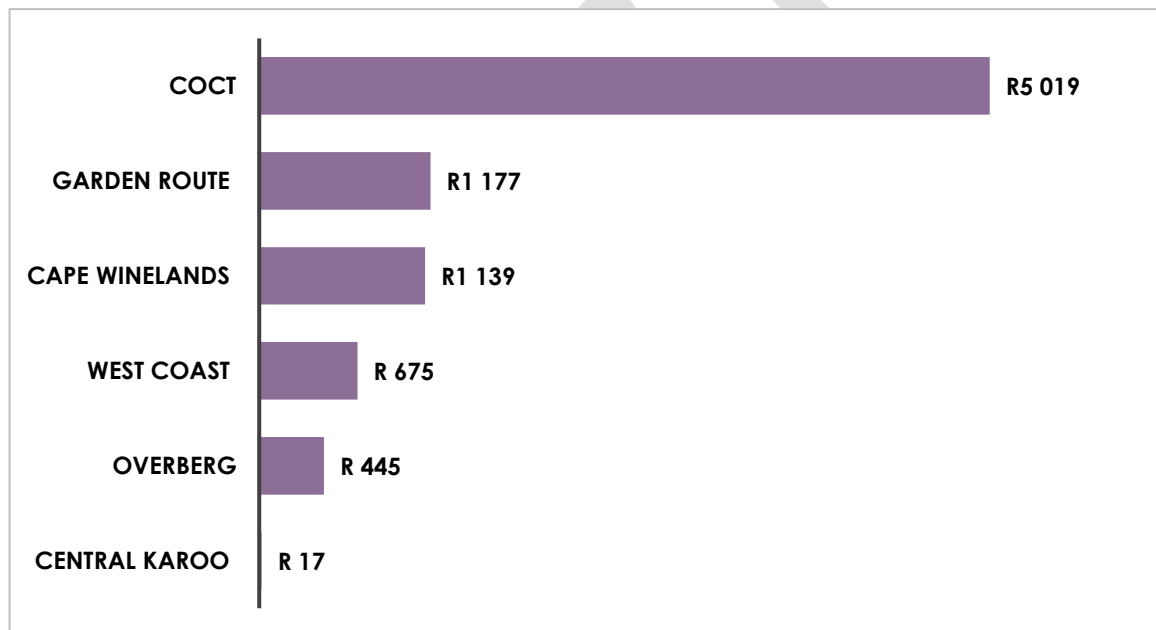


Figure 39: Municipal waste management revenue within each district 2018/19-2020/21 (millions)

● Capital expenditure

The capital expenditure for infrastructure projects for all the municipalities in the district is indicated in Figure 40 for a three – year period 2018/19-2020/21. An overview of capital expenditure per district is as follows:

- The CoCT has had the highest capital spend for waste management-related infrastructure of all the regions during these three financial years.
- Municipalities in the Central Karoo District have had a minimal spend over the same period with no capital spend from the Laingsburg Municipality during this period.
- In the Overberg District, the Swellendam Municipality has had no capital expenditure over the three year period.
- In the Garden Route District, the Kannaland Municipality has spent a minimal amount and the Oudtshoorn Municipality has had no capital expenditure over the same period.

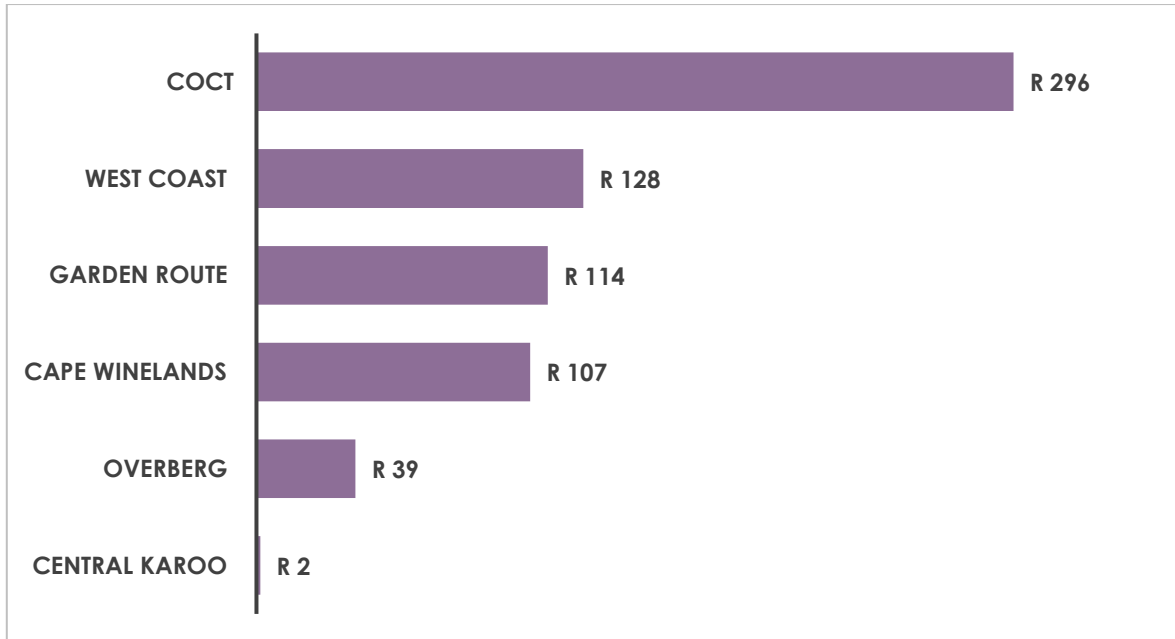


Figure 40: Municipal waste management capital expenditure within each district 2018/19-2020/21 (millions)

● Operational expenditure

To ensure that effective waste management services are provided, municipalities need to ensure that sufficient funds are set aside to provide these services. From Figure 41, it can be seen that due to its higher population and service needs, the CoCT has the highest operational expenditure, by far, compared to all the other districts. In the case of some of the municipalities, operational costs exceed revenue generated from waste management services. This likely means that the true cost of waste management is not being considered when setting waste management tariffs.

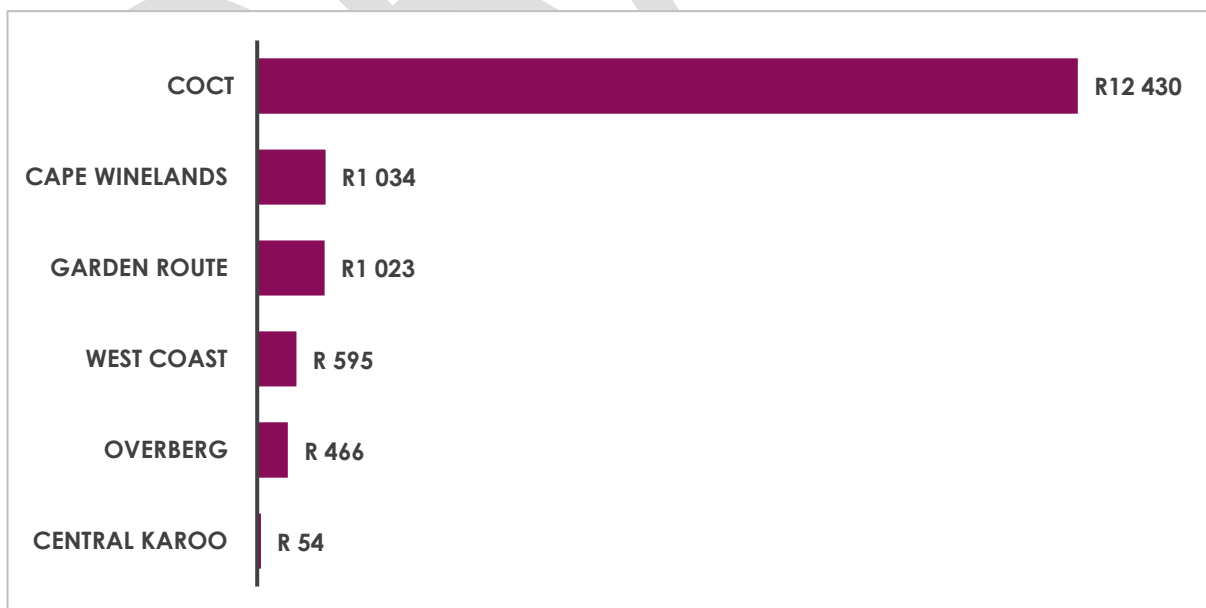


Figure 41: Municipal waste management operational expenditure within each district for 2018/19-2020/21 (millions)

3.2.10. Waste Management Jobs

According to GreenCape (2020b), the waste economy contributed R24.3 billion to the South African GDP in 2016. It provided 36 000 formal jobs and supported 80 000 informal jobs/livelihoods. A further R11.5 billion per year could be unlocked by 2023 by diverting up to 20 million tonnes of waste. It further added that with recent changes in legislation opportunities within the organics, e-waste, plastics and builders' rubble sectors have the potential to add between approximately R661 and R1 086 million in value to the economy. It is anticipated that the spin-offs could include 45 000 additional formal jobs and 82 000 indirect jobs, as well as create 4 300 SMMEs (GreenCape 2020b).

● Formal Waste Sector Jobs

In 2012, it was estimated that the formal waste sector employed 29 833 people. This included people employed at both public and private places (DST, 2013). In the private waste sector, most people (77.5%) are employed by large enterprises, with an annual revenue of > R 51 million, while in the public sector, the majority of people (64.9%) are employed by metropolitan municipalities (Category A). Employment in the public sector has levelled off at around 20 000 people (DST, 2013). Potentially, another 5 000 people could be employed if vacant positions at municipalities are filled. It was estimated that in 2012, the minimum value of the formal sector was R15.3 billion (DST, 2013). This was equivalent to about 0.51% of GDP at the time. The estimated contribution of the private sector was approximately R7 billion, while that of the public sector was approximately R8.3 billion.

● Informal Sector Jobs

There is no official estimate of the number of waste pickers in South Africa. Initial estimates ranged between 60 000 and 90 000 pickers (DEA, 2014b), but more recent estimates are as high as 215 000 pickers (Godfrey and Oelofse, 2017). The increase in the number of waste pickers over the past few years has been partly attributed to rising unemployment in South Africa, forcing people to seek a livelihood in the informal sector.

The Department recognises the role of the informal sector in diverting waste from landfill and have embarked on a support programme for small and micro- waste entrepreneurs since 2015/16. The Department has supported 35 small and micro-waste entrepreneurs over a three-year period until 2018 by providing onsite mentorship and support to these enterprises while also arranging accredited entrepreneurial skills training from sister departments, Department of Economic Development and Tourism (DEDAT) and from our recycling

KEY INSIGHTS

- The high unemployment rate and specifically youth unemployment in the country is a concern. The waste sector has been identified as a key sector for growth and jobs. Both formal and informal jobs in waste are essential to the waste economy.
- The informal waste economy is represented largely by waste pickers who salvage approximately 80% to 90% of post-consumer paper and packaging collected in the country for recycling. Waste pickers, especially women waste pickers are a vulnerable group within the waste value chain. Waste picker integration is necessary to ensure that waste pickers' incomes, conditions, job security, position in the value chain and dignity are improved as the recycling economy is expanded.
- There is also a need to provide additional mentorship and to support SMMEs in accessing municipal tenders and recyclable materials.

industry partners through the WCrag. A need was identified to assist municipalities with their waste services procurement specifications in a manner that supports access of these small and micro- waste entrepreneurs to municipal tenders or to recyclable material. A waste management procurement guide was developed for municipalities in 2020/21 financial year. The project has now been extended to include assistance to four municipalities who are embarking on small and micro- waste entrepreneur and or waste picker integration projects. The Department is currently mapping all waste picker support initiatives in the Western Cape to understand the informal sector and what the contribution of the informal sector is towards the waste economy the Western Cape.

During 2020, the Department assisted with the collation of waste picker information in the Western Cape as part of the Waste Picker Relief programme. The programme was set up by DFFE, the packaging industry and waste reclaimer associations to provide COVID-19 relief to waste pickers in the form of electronic food vouchers.

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4. An Analysis of the Extent of Implementation of the WC IWMP 2017-2022

The WC IWMP 2017-2022 includes four strategic goals, each goal includes objectives and activities for implementation. This section presents an overview of the Department's performance as measured against its strategic goals, objectives and targets for the 2017-2022 period (Table 12). Although the Department has implemented many of the activities indicated, there are some activities that were not undertaken due to resource constraints.

Table 12: Implementation of the Western Cape Integrated Waste Management Plan 2017-2022

WC IWMP 2017-2022 Goals	Output Indicators Achieved (No.)	Output Indicators Achieved (%)
Goal 1: Strengthened education, capacity, and advocacy towards Integrated Waste Management	5/7	71%
Goal 2: Improved integrated waste management planning and implementation for efficient waste services, technologies and infrastructure	11/13	85%
Goal 3: Effective and efficient utilisation of resources	6/7	86%
Goal 4: Improved compliance with environmental regulatory framework	12/16	75%
Overall IWMP Implementation	34/43	79%

A list of the achievements and activities undertaken by the Department is provided:

Goal 1: Strengthened education, capacity, and advocacy towards Integrated Waste Management

- The Department has hosted the Integrated Waste Management Forum on a quarterly basis and the Industry Waste Management Forum on an annual basis over the 5-year period.
- The Department has hosted waste minimisation training with municipalities over the past 5 -years
- Various Integrated Waste Management capacity-building sessions were hosted over the 5-year period including waste characterisation training; IPWIS and waste calculator capacity-building sessions; Licensing process and operations at waste management facilities, internal auditing; landfill gas monitoring; rehabilitation and remediation of the Hermanus landfill sites; landfill airspace separation at source; regional cooperation; Extended Producer responsibility; Municipal Transport and collection efficiencies; municipal costing models; Waste diversion; littering and illegal dumping; minimum requirements for the appointment of waste managers; Integrated Waste Management Plans; IWMP/IDP/SDF integration
- The Department conducted waste minimisation training with municipal staff in Beaufort West, Kannaland, Swellendam, Drakenstein; with 109 YES programme workers of Cape Nature and 11 informal workers from the iThemba Labantu project
- The Department developed minimum criteria for the appointment of waste managers

Goal 2: Improved integrated waste management planning and implementation for efficient waste services, technologies and infrastructure

- The Department provided support to the Central Karoo District, Laingsburg, Prince Albert and Beaufort West Municipalities and other municipalities during their IWMP development process. The Department also endorsed 10 municipal IWMPs during the 5-year IWMP period. The Department also developed an IWMP process flow and SOP during the period.
- The Department conducted site visits and assessments to companies within the consumer-formulated chemical sector.
- Alternative Waste Treatment technologies decision making tool was developed in conjunction with GreenCape
- Developed a status quo on e-waste.
- Developed a status quo and a guideline on the beneficiation of treated sewage sludge.
- The Department surveyed 12 farms in the Breede River area as part of the African Stockpile Program
- The Department has facilitated the allocation of MIG funding for waste management infrastructure projects
- The Department helped facilitate the establishment of the Regional Waste disposal facilities in Garden Route, West Coast, Overberg and Cape Winelands Districts
- The Department monitors municipal basic refuse removal services from Annual report data. The Department also conducted a status quo on municipal transport and collection
- The Department submits quarterly IPWIS data reports to SAWIS and continuously monitors and provides support to municipalities on IPWIS registration and reporting
- The Department conducts waste verifications of selected municipalities to verify municipal data
- Developed annual state of waste reports (SoWRs) (currently in the process of developing 2021 SoWR).
- The Department conducted IPWIS support and maintenance including the design of the complaints module, the development of the PowerBi schema, COVID-19 functionality, upgrade of JAVA 8 and administrative functions

Goal 3: Effective and efficient utilisation of resources

- The Department developed a Construction and Demolition Waste Management Guideline for Municipalities
- The Department workshopped and developed an Abattoir Waste Guideline and Generic Organic Waste Diversion plans
- The Department attended meetings with the Attended meetings with the Recovered Materials Committee (RECMAT)
- The Department has engaged with GreenCape and provided them with a platform to inform Industry about the WISP program and encourage their participation
- The Department has provided ongoing monitoring and support to SMME's and developed a tool assist them
- The Department developed a tool for alternative waste treatment technologies
- The Department has set waste diversion targets within varied waste management licenses. The Department also developed an organic waste strategy and hosted workshops in various districts to facilitate regional solutions.

Goal 4: Improved compliance with environmental regulatory framework

- The Department has on average conducted 72 compliance visits to licensed waste management facilities. The Tygerberg HCRW plan was assessed during the period. The

Department was also involved in compliance visits to health care facilities and treaters during the 2020/21 financial year.

- The Department has dealt with over 100 waste related complaints for the period
- The Department has reviewed and updated the waste licensing standard operating procedure
- The Department has reviewed and amended the waste licensing audit protocol a number of times over the period
- The Department has set waste diversion targets in waste variation licenses
- The Department developed a generic Integrated Waste Management By-law for municipalities
- Engagements with stakeholders to influence the development of a risk-based methodology for WMFs.
- The Department engaged with the consumer-formulated chemical sector and the Health-care sector

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5. Gaps and Needs Analysis

5.1. Objectives

The objectives of the gaps and needs analysis is to compile a summary of identified waste management gaps and needs in the province that must be addressed to achieve the desired-end state for waste management.

Sources of gaps include:

- An analysis of the extent of implementation of the WC IWMP 2017-2022;
- Situational Analysis;
- Gender Gap Analysis;
- Consultation and engagement with internal and external stakeholders.

5.2. Gaps Identified in Terms of the Implementation of the WC IWMP 2017-2022

The following activities were not implemented in the WC IWMP 2017-2022 (Table 13). Activities that are still relevant will be included in the WC IWMP 2022-2027 implementation plan.

Table 13: Activities that were included in the WC IWMP 2017-2022 and not implemented

GOAL	ACTIVITY
Goal 1: Strengthened education, capacity, and advocacy towards Integrated Waste Management.	<ul style="list-style-type: none"> ● Roll out an industry rewards recognition programme on integrated waste management ● Mainstream integrated waste management in schools and training institutions.
Goal 2: Improved integrated waste management planning and implementation for efficient waste services, technologies and infrastructure.	<ul style="list-style-type: none"> ● Monitor the implementation of municipal IWMPs ● Develop a guideline for e-waste management. ● Facilitate the prioritisation, establishment and monitoring of Integrated Waste Management Infrastructure and services. ● Facilitate discussions with the Department of Human Settlements (DoHS) regarding funding for waste management infrastructure in public housing projects.
Goal 3: Effective and efficient utilisation of resources	<ul style="list-style-type: none"> ● Assist with the development of projects for the waste economy business cases.

<p>Goal 4: Improved compliance with environmental regulatory framework</p>	<ul style="list-style-type: none"> ● Engage and monitor industry for compliance to Part 8 of Chapter 4 of the NEM:WA.⁶ ● Conduct an assessment of contaminated land in the Western Cape.⁷ ● Build a business case for the management of contaminated land in the Western Cape. ● Compile a guideline on the regionalisation of waste management infrastructure and services.⁸
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5.3. Gaps Identified from the Situational Analysis and During Stakeholder Engagement

Gaps identified from the situational analysis and during stakeholder engagement are summarised in Table 14.

Table 14: Summary of identified gaps

CATEGORY	IDENTIFIED GAPS
<p>Waste Information</p>	<ul style="list-style-type: none"> ● Lack of reporting on IPWIS and accuracy of reporting in certain areas of the Province from public and private sectors. ● The availability of waste characterisation info and the accuracy of the data. ● Challenges in the capturing of certain beneficiation/ recycling/ diversion activities. ● Improved information management capacity at municipal level.
<p>Waste Education and Awareness</p>	<ul style="list-style-type: none"> ● General lack of education and awareness on waste management and a lack of strategies to implement such awareness programs. ● Councillors, faith-based organisation leaders, local artists etc. can play a major role in creating waste awareness campaigns. ● More targeted waste awareness initiatives that will speak and reach different groups.
<p>Waste Collection and Transportation</p>	<ul style="list-style-type: none"> ● Poor service delivery in certain areas of the Province and challenges in accessing waste from informal settlements. ● Integration, training and support of waste salvaging / waste pickers. ● The age of waste fleet vehicles and the lack of maintenance and replacement plans. ● Lack of waste to rail projects and challenges in implementation ● Refuse collection statistics only report on account holders.
<p>Circular Economy</p>	<ul style="list-style-type: none"> ● Value of recycling is too low. How to value waste as a resource?

⁶ Part 8 cases were identified for compliance monitoring but inspections were placed on hold during the COVID-19 pandemic.

⁷ The Department has a database of contaminated land cases, which can provide an indication of where our hotspots are, or the areas where significant contamination was found in the past. The database will be able to show the areas in which the Department receives the most cases.

⁸ The Department is in the process of developing a guideline (internally) for the management of contaminated land. Phase 1 of the guideline is completed, It is anticipated that Phase 2 of the Guideline will be completed in 2022.

	<ul style="list-style-type: none"> ● Accessibility to waste streams that can be used in existing processes. ● Lack of knowledge on benchmarked or alternative, sustainable waste management solutions amongst industry professionals. ● More focus on uncommon waste streams in the private sector i.e. foundry sand, brine, paint sludge. ● Promote the implementation of separation at source and recycling programmes that go beyond pilots and specific areas. ● A strong focus on the approaches to waste separation and diversion and how it can be mainstreamed. ● Need to reduce production with virgin material and encourage the use of secondary materials. ● Insufficient assistance provided to producers to get their packaging materials out of the waste stream. ● How do we as WCG support green SMMEs to be sustainable through capacity and training opportunities. ● Improved communication and engagement between PROs and Municipalities in planning to implement EPR effectively and the role of provinces must be fleshed out i.e. expand on our compliance monitoring role. Improve rate of registration and payment of EPR fees. Eliminate free-riders. ● Promote with and assist with the development of Green Chemistry. ● Biomass economies as a way to reduce organics in landfills. ● Need to address materials specification and green procurement to drive markets and create demand for remanufactured products. ● Diversion options and alternatives for rural areas where recycling markets are too far (e.g. Central Karoo District). ● Assist with the development of projects for the waste economy business cases.
<p>Waste Management Infrastructure</p>	<ul style="list-style-type: none"> ● Widespread illegal dumping. ● Lack of priority given to compliance at landfills. ● Reducing climate change emissions from landfills or capturing of gases for use. ● Regionalisation of waste management services. ● Lack of adequate waste infrastructure and land for new waste management infrastructure within the urban area. ● Dependencies on other key role players, government departments for infrastructure such as rail. ● More emphasis should be placed on sustainable funding and sustainable funding mechanisms towards waste infrastructure.
<p>Governance & Institutional Arrangements</p>	<ul style="list-style-type: none"> ● High costs associated with landfill closure and rehabilitation. ● Lack of organic waste management plans received from municipalities and poor quality of these plans. Plans to be integrated with IWMPs. ● More collaboration/ knowledge sharing events and partnerships are needed. ● Ability of municipalities to be able to fully finance the waste management service.

	<ul style="list-style-type: none"> ● The setting of criteria for more specific job descriptions for appointing competent waste managers. ● Some Municipal by-laws are not aligned to NEM:WA. Municipalities are requested to consider the draft Model By-law developed by DEA&DP. ● Some Municipalities do not have updated IWMPs in place. ● Lack of reporting by Municipalities on implementation of IWMPs in Annual reports and monitoring the implementation of Municipal IWMPs ● Waste performance indicators imbedded in IDPs linked to budgets.
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5.4. Gaps Identified during the Gender Gap Analysis

The Gender Gap Analysis undertaken of the WC IWMP 2017-2022 highlighted that the needs and preferences of women and other vulnerable groups must be identified and addressed. The following gaps are applicable:

- Low representation of women in the waste sector in decision-making positions.
- There is a need for networking, skills training and job opportunities for vulnerable groups e.g. women, youth and people living with disabilities in the waste sector.
- Waste pickers face health and safety challenges when carrying out their work, women are especially impacted by the lack of sanitation at WDFs.
- Women waste pickers are often discriminated against (limited access to high-value materials/ often receive less money for products compared to men)
- Need for recycling to be more accessible to those with mobility issues i.e. elderly people and people living with disabilities.
- Need for awareness-raising messages to be more inclusive to reach those with disabilities i.e. use of audio communication to get messages across to those with visual impairment.
- Need for awareness-raising messages to be targeted.

5.5. Prioritisation of Needs Based on Gap Analysis

Priority needs based on the gaps identified are indicated below:

- Accurate and consistent (reliable) waste data from industry and municipalities.
- Targeted waste education and awareness programmes, which include various role-players.
- Improved access to waste collection services, specifically in underserved areas.
- Improved promotion of prevention, reduction, re-use and recovery of waste to support a circular economy.
- Integrated waste management infrastructure for recovery, treatment and disposal and an increase in compliance with waste management legislation.
- Strengthened governance and partnerships, and ensuring sustainable financial management
- Respond to the needs of women and other vulnerable groups.

5.6. Formulation of Strategic Goals which Respond to Identified Needs

The prioritised needs were used to formulate key strategic waste management goals which form the basis of the WC IWMP. The strategic goals are captured in Section 6.

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6. Implementation Plan

When developing the Implementation Plan and considering how to take it forward, a citizen - centric approach, in which the needs of citizens are served, was considered key. The Batho Pele “People First” principles are key to service delivery and provide public servants with a guide to serving the members of the public in terms of consultation, service standards, access, information, courtesy, openness and transparency, redress and value for money.

The current vision and mission for waste management was reviewed to ensure that it took a more citizen - centric approach. The current vision and mission for waste management were determined to still be largely applicable, however the term “inclusivity” has been added to highlight the need for waste management to be inclusive of all people, and to highlight that all citizens have a right to a clean and healthy environment, basic services and economic opportunities. In addition, the need to make use of technology to support waste management has been included in the mission to highlight the need for innovation in the waste sector.

The vision and mission are stated as follows:

Vision:

“A resource-efficient, inclusive and thriving society that ensures a clean environment”

Mission:

“Building a resource-efficient, inclusive and thriving society that recognises the value of waste, supported by affordable, appropriate services, technologies and infrastructure through good governance and partnerships that will benefit communities, the economy and the environment”

6.1. Alignment of goals

Strategic goals and objectives were developed based on the prioritised needs. These goals align to the NWMS, 2020 pillars as indicated in Table 15.

Table 15: Alignment of Western Cape IWMP Goals with NWMS, 2020 strategic pillars

WC IWMP GOALS	NWMS, 2020 STRATEGIC PILLARS
Goal 1: Strengthened education, capacity, awareness and advocacy towards Integrated Waste	Compliance, enforcement and awareness
Goal 2: Improved integrated waste management planning and implementation for efficient waste services, technologies and infrastructure	Effective and sustainable waste services
Goal 3: Effective and efficient utilisation of resources	Waste minimisation
Goal 4: Improved compliance with the environmental regulatory framework	Compliance, enforcement and awareness

6.2. Overview of goals:

6.2.1. Goal 1: Strengthened education, capacity, awareness and advocacy towards Integrated Waste Management

Waste awareness and education were identified as one of the gaps in integrated waste management during the situational analysis and stakeholder engagement. Stakeholders highlighted the lack of strategies to implement education and awareness on waste management as well as a lack of involvement by organised community leaders including ward councillors. It was also emphasised that there needs to be targeted awareness-raising programmes that will contribute to the promotion of prevention, reduction, re-use and recovery of waste to support a circular economy. The need for awareness-raising to be more inclusive by involving vulnerable groups was highlighted in the Gender Analysis report and examples would include awareness campaigns that use audio communication for the visually impaired.

The NWMS (2020) also highlights the need for a shift in behaviour and attitude towards littering, illegal dumping and the awareness of the related environmental impacts. This is further emphasised in Pillar 3 of the strategy, which aims to mainstream waste awareness and a culture of compliance that will result in a zero tolerance of pollution, littering and illegal dumping.

A waste education and awareness strategy for the province was developed by the Department and an industry forum was established to provide a platform for engagement with industry. The Department will continue to facilitate consumer and industry responsibility and mainstream integrated waste management education and awareness at all societal levels. The Department will also encourage municipalities to adopt the waste education and awareness strategy for conditions in their municipal areas and for the different income levels in order to promote integrated waste management. The Department will continue to capacitate municipalities through the Waste Management Officer's forum held on a quarterly basis and the integrated waste management capacity-building workshop hosted annually. This aligns with section 154(1) of the Constitution, which requires national and provincial governments to support efforts that strengthen municipal performance. Capacity building and skills development of municipal officials is crucial to ensure service delivery and the enforcement of the laws that govern integrated waste management. Municipalities need support to ensure that qualified people are hired to perform their duties as per the requirements of the Municipal Systems Act 32 of 2000 and the Municipal Finance Management Act of 2003. Key waste management areas municipalities need to be capacitated in, include-

- full -cost accounting and alternative revenue sources/co-funding;
- auditing and operation of WMFs;
- planning for informality;
- long-term financial planning;
- waste licensing process;
- waste management planning and information management;
- management of specific waste streams;
- waste characterisation;
- recovery and use of waste material as a resource;
- waste minimisation; and entrepreneurial training etc.

Objectives:

- Objective 1: Facilitate industry responsibility in integrated waste management;
- Objective 2: Create awareness and education of integrated waste management; and
- Objective 3: Build and strengthen integrated waste management capacity.

Expected outcome:

- Improved waste management and the prevention of pollution, litter and illegal dumping.

6.2.2. Goal 2: Improved integrated waste management planning and implementation for efficient waste services, technologies and infrastructure

Goal 2 aims for citizens of the Western Cape to live in clean communities with well managed and financially sustainable waste services. The goal aims to provide support to municipalities regarding integrated waste management planning and to promote integrated waste planning within industry. The majority of municipalities in the province have drafted their 3rd generation IWMPs and some have already drafted 4th and 5th generation plans. The Department strives to ensure alignment between the IDP process and the development of municipal IWMPs. The Department will review the Integrated Waste Management Planning Guideline for municipalities and plans to focus on monitoring the implementation of the plans by assessing municipal annual reports. The implementation of IWMPs is limited by budgetary constraints within municipalities as the waste management component often receives a small percentage of the municipal budget. The Department will facilitate industry waste management planning by promoting the waste management hierarchy with specific focus on waste prevention and/ or minimisation from source as well as encouraging post-consumer responsibility.

The promotion of public-private partnerships for investment in infrastructure is crucial for the provision of adequate and equitable services and this may include partnerships between municipalities through the regionalisation of waste management services. Furthermore, financial investment, the forming of strategic partnerships with the private sector, the efficient delivery of waste management services and the application of alternative waste treatment technologies are required to ensure equitable waste management services and clean communities.

The Department engages municipalities and industry through the integrated waste management officers' forum and industry forum, respectively with respect to integrated waste management planning. These platforms have had success in ensuring that both industry and municipalities are aware of new policies and legislation regarding waste management and any new waste technologies that may be implemented.

Objectives:

- Objective 1: Facilitate municipal integrated waste management planning;
- Objective 2: Promote industry waste management planning and the circular economy;
- Objective 3: Promote the establishment of integrated waste management infrastructure; and services; and
- Objective 4: Ensure effective and efficient waste information.

Expected Outcome:

- All citizens of the Western Cape live in clean communities and have access to well managed and financially sustainable waste services.

6.2.3. Goal 3: Effective and efficient utilisation of resources

Goal 3 aims to minimise the impact of waste on the environment by moving away from the dependence on waste disposal to the diversion of waste from landfill through re-use, recycling, recovery, refurbishment and alternative waste treatment methods. A key waste type that has been identified for diversion from landfill in the 2nd Generation WC IWMP is organic waste. The plan proposed a 50% diversion of organic waste by 2022 and 100% by 2027; these have been included in WML conditions to ensure compliance. The Department will continue to focus on the diversion of organic waste and monitor the progress of municipalities towards achieving the target of 100% diversion. The Department will also focus on the diversion of other waste types such as Construction and Demolition Waste and packaging waste.

The Department aims to support municipalities in diverting waste from landfill and aims to create an enabling environment for the private sector to undertake waste beneficiation and by supporting the use of innovation and technology. The aforementioned requires the need to form key strategic partnerships with municipalities and the private sector. The Department also aims to provide support to SMME's and waste entrepreneurs to stimulate jobs in waste.

Goal 3 provides an opportunity for the Department to respond to the needs of vulnerable groups, i.e. women, people with disabilities, the aged and the youth, through training initiatives, networking opportunities, especially within the refurbishment sector. This would also require the need to partner with the Department of Social Development to identify opportunities in this regard.

Another key aspect to this goal is the need move towards the circular economy, with the aim to reduce waste and become less resource intensive by redesigning products, promoting the refurbishment sector, and using waste as a resource. The national EPR regulations are a useful tool to assist in shifting towards a circular economy. The Department will provide support where necessary to ensure implementation of these regulations in the province.

Objectives:

- Objective 1: Minimise the consumption of natural resources and promote the circular economy;
- Objective 2: Stimulate job creation within the waste economy; and
- Objective 3: Increase waste diversion through reuse, recovery and recycling.

Expected outcome:

- The reduction of waste to landfill through increased re-use, recycling, recovery, refurbishment and alternative waste treatment.

6.2.4. Goal 4: Improved compliance with regulatory compliance framework

Goal 4 has been carried over from the 2nd generation WC IWMP with no changes as it is still pertinent to the mandate of the Provincial department. This is reflected in the Western Cape Strategic Plan (2019-2024), Focus Area 3 which aims for increased social cohesion and safety

of public places and further states that a healthy living environment is a precondition for creating safe and cohesive communities.

Goal 4 thus aims to give effect and provide oversight to the above by ensuring the sound management of WMFs and the protection of public health and the environment. This will be done through compliance promotion measures, compliance enforcement, promoting industry self/coregulation as well as auditing and monitoring of WMFs. A key project in relation to this goal is the rolling out of the Western Cape Illegal Dumping Strategy as this has been a challenge to Municipalities across the Province. The Department also has several tools i.e., auditing tool and the alternative waste technology/airspace tool which will help municipalities improve their level of compliance. This goal will also focus on developing policy instruments for industry and municipalities and amending/varying existing WMLs. The remediating and rehabilitation of contaminated land will also be focused on. Goal 4 aligns with the National Waste Management Strategy (2020), Pillar 3 which is Compliance, Enforcement and Awareness.

Objectives:

- Objective 1: Strengthen compliance monitoring and enforcement;
- Objective 2: Facilitate the rehabilitation of Waste Management Facilities

Expected outcome:

- Creating a culture of compliance with zero tolerance towards pollution, littering and illegal dumping.

6.3. Implementation Table

Western Cape Integrated Waste Management Plan 2022-2027 Implementation Plan

Goal 1: Strengthened education, capacity, awareness and advocacy towards Integrated Waste Management						
Objectives	Output indicator	Activity	Timeframes (Mark with X)			Responsibility
			2023-2027	2027-2032	2032-2037	
Objective 1: Facilitate industry responsibility in integrated waste	Feasibility study for an Industry Rewards Programme	Investigate the possibility of an Industry rewards recognition programme on integrated waste management	X			DEA&DP
	Number of industry reward programmes developed	Develop assessment criteria for the Industry rewards recognition programme		X		DEA&DP
	Number of industry reward programmes rolled out to targeted industry sectors	Roll out Industry rewards recognition programme on integrated waste management (Pharmaceutical etc.)			X	DEA&DP
	Number of Industry Waste Management Forums hosted.	Host the Industry Waste Management Forum	X	X	X	DEA&DP
Objective 2: Create (awareness and	Number of Status Quo studies undertaken on	Conduct a SQ on current formal Waste	x			

education of integrated waste management (consumer awareness can be included here)	waste management courses offered at tertiary level	Management Courses being offered at tertiary level (throughout the country); Overseas – need a follow-up				
	Number of Waste minimisation and waste awareness training workshops with targeted communities	Waste minimisation and waste awareness training workshops with targeted communities (2 per year)	X	X	X	
	Number of co-design workshops undertaken	Co-design workshops to address waste management challenges with targeted communities	X	X	X	
	Number of integrated waste management capacity-building workshops hosted	Integrated Waste Management Capacity-building workshops:	X	X	X	

Objective 3: Build and strengthen integrated waste management capacity.	Number of waste minimisation systems training undertaken	Waste minimisation systems training for municipal officials		X	X	
	Number of waste bylaw support initiatives undertaken with municipalities	Waste Bylaw development and implementation support to municipalities	X	X	X	
	Number of WCRAK engagements	WCRAK Knowledge sharing engagements	X	X	X	
	Number of organic waste knowledge sharing and networking workshops undertaken	Organic waste knowledge sharing and networking workshops	X	X	X	
	Number of wastepreneur integration workshops with municipal officials undertaken	Host wastepreneur integration workshops with municipal officials	X	X	X	
	Number of landfill operator training undertaken	Landfill operator training	X	X	X	
	Number of councillor forums established	Establishment of councillor forum (Purpose, TOR)	X			
	Number of waste management officer forums hosted.	Waste Management Officers Forum	X	X	X	

Goal 2: Improved integrated waste management planning and implementation for efficient waste services, technologies and infrastructure						
Objectives	Output indicator	Activity	Timeframes (Mark with X)			Responsibility
			2023-2027	2027-2032	2032-2037	
Objective 1: Facilitate municipal integrated waste management planning	Number of IWMPs developed	Support municipalities with the development of IWMPs	X	X	X	
	Number of IWMPs endorsed	Assess and endorse Municipal IWMPs	X	X	X	
	Number of Annual reports monitored	(Assist and)Monitor the implementation of municipal IWMPs	X	X	X	
	Number of IWMP guidelines reviewed and updated	Review and update Guideline/template style/ for IWMP development (waste characterisation)	X			
	Number of topographical surveys undertaken	Undertake topographical surveys of selected waste disposal facilities to determine landfill airspace	X			

Objective 2: Promote industry waste management planning and the circular economy	Number of engagements with the hospitality sector	Monitor and promote Industry Waste Management Planning and the circular economy in the hospitality sector	X			
	Number of WCrag Knowledge sharing and capacity building engagements with SMMEs	Host WCrag Knowledge sharing and capacity building engagements with SMME in the recycling sector	X	X	X	
	Number of interventions that support EPR implementation	Assist with EPR implementation	X	X	X	
Objective 3: Promote the establishment of integrated waste management infrastructure and services (differentiate	Number of technology sharing workshops hosted	Host technology sharing workshops on waste minimisation with municipal officials	X	X	X	
	Number of interventions supporting regional cooperation	Regional cooperation and Regionalisation of waste management	X	X	X	

between large scale and small-scale infrastructure)		services at all (municipal, provincial & national) waste management platforms (rail also comes into play)				
Number of infrastructure assessment reports developed	Conduct an assessment of municipal infrastructure needed	x				
Number of motivations drafted for municipal yellow fleet	Support motivations by municipalities for the procurement of yellow fleet	x	x	x		
Annual State of Waste Management Report	Assess, interpret and disseminate waste management information.	x	x	x	DEA&DP	

Objective 4: Ensure effective and efficient waste information management	Verification of submitted and reported waste data to the IPWIS	Conduct IPWIS waste data verifications of selected facilities to ensure reported information is accurate and credible.	x	x	x	DEA&DP
	Capacity building sessions conducted with relevant IPWIS stakeholders	Conduct IPWIS capacity building with relevant stakeholders on IPWIS functionality and related waste information legislation	x	x	x	DEA&DP/Municipality/Industry
	An enhanced Integrated Pollutant and Waste Information System (IPWIS)	Maintain, enhance and support the IPWIS to ensure alignment to legislative and business requirements	x	x	x	DEA&DP/Centre for e-Innovation / municipalities
	An assessment conducted on the reliability of the IPWIS system	Test the reliability of the IPWIS System	x			

Goal 3: Effective and efficient utilisation of resources						
Objectives	Output indicator	Activity	Timeframes (Mark with X)			Responsibility
			2023-2027	2027-2032	2032-2037	
Objective 1: Minimise the consumption of natural resources and promote the circular economy	Number of engagements with the private sector	Engage private sector wrt the beneficiation of identified large waste generators(IPWIS)	X			
	Number of action plans implemented	Implement strategy and action plans to promote the repair and refurbishment sector and other targeted sectors	X			
	Number of WCrag seminars hosted	Host WCrag seminars on initiatives (e.g. facilitation of EPR implementation) that support the growth of the circular economy	X	X	X	
	Number of engagements with SALGA	Collaborate with SALGA around EPR	X	X	X	
	Number of engagements with Municipalities to facilitate the diversion of organic waste	Facilitate and ensure municipalities divert organic waste	X	X	X	

	Number of interventions wrt the biological cycle of the circular economy	Promote and facilitate the regenerative biological cycle of the circular economy	x	x	x	
	Number of interventions wrt technical (refurbishment) cycle of the circular economy	Promote and facilitate the technical (refurbishment) cycle of the circular economy	x	x	x	
	Number of support initiatives provided to SMME's	Provide assistance and support (through PROs e.g. fibrecycle and through working with municipalities) to SMME's in the waste sector	X	X	X	
Objective 2: Stimulate job creation within the waste economy	Number of WCrag SMME support seminars hosted	Host a WCrag SMME support seminar	X	X	X	
	Number of wastepreneur integration support initiatives undertaken	Provide "wastepreneur" integration support to municipalities	X	X	X	
	Number of interventions undertaken to stimulate the repair and refurbishment sector	Implement strategy and action plans to stimulate the repair and refurbish sector(textiles, furniture		X	X	

		etc.) in a manner that leads to job creation and skills development for vulnerable sectors of society.				
	Number of waste minimisation knowledge sharing and capacity building workshops undertaken	Waste minimisation Knowledge sharing and capacity building workshops	X	X	X	
Objective 3: Increase waste diversion through reuse, recovery and recycling	Number of organic waste diversion interventions undertaken	Promote the diversion of organic waste	X	X	X	
	Number of construction and demolition waste diversion interventions undertaken	Promote the diversion of Construction and demolition waste	X	X	X	
	Number of packaging waste diversion interventions undertaken	Promote the diversion of Packaging waste (EPR)	X	X	X	
	The number of Green Procurement Strategies implemented	Promote and institute Green Procurement throughout WCG	x			
	Number of cleaner production interventions with the manufacturing sector	Promote Cleaner production with the manufacturing industry sector	x	x	x	
	Number of interventions wrt the beneficiation of	Promote the diversion and beneficiation of	x	x	x	

	absorbent hygiene products	Absorbent hygiene products				
	Number of engagements wrt sustainable management of school's chemicals	Promote the sustainable management of school's chemicals	x	x	x	
	Number of engagements wrt Agrochemicals	Facilitate the management of Agrochemicals	x	x	x	

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Goal 4: Improved compliance with the environmental regulatory framework						
Objectives	Output indicator	Activity	Timeframes (Mark with X)			Responsibility
			2023-2027	2027-2032	2032-2037	
Objective 1: Strengthen compliance and enforcement	Number of co-design processes undertaken	Implement a Co-design process with a targeted community to address littering, burning of waste and illegal dumping challenges	X	X	X	
	Number of audits conducted	Conduct Departmental audits as per APP targets	X	X	X	
	Number of interventions wrt the roll out of the Illegal dumping strategy	Roll out the Strategy to Reduce Illegal Dumping in the Western Cape Province	X			
Objective 2: Facilitate rehabilitation of Waste Management Facilities		Decommissioning of waste management facilities	X	X		
		Liaise with Treasury wrt funding for the decommissioning of waste management facilities	X	X		

7. Monitoring, Review and Reporting

7.1. Monitoring and Review

Monitoring the implementation of the WC IWMP must be undertaken as it is an essential part of the planning process. The implementation plan includes output indicators, which will be used to assist with monitoring. Annual performance reports will be used to monitor progress and to ensure that actions are implemented. The following will be monitored and reported on in the annual performance reports:

- Performance and progress on meeting short, medium and long-term goals and objectives;
- Budget forecasting and budgeting constraints with respect to implementation of the WC IWMP; and
- Amendments to the IWMP necessitated by constraints in terms of finances and capacity (note that the WC IWMP will be revised every 5 years).

Performance of municipalities will be monitored using the Integrated Performance Support System, which is a provincial system developed to quantify the impact of the current support processes at municipalities and applies unified principals of predetermined criteria used to categorise municipalities that need support. The system is a single electronic monitoring and reporting tool which aims to reduce reporting fatigue at municipalities. Each municipality will be assessed on each of the governance areas and will be categorised based on their level of maturity in respect of each governance area.

Performance of the Provincial Department, in implementing its IWMP will be monitored by tracking work done as per its Annual Performance Plan (APP). An IWMP Monitoring Committee, consisting of waste management officials will review the APP in conjunction with the WC IWMP Implementation Plan and track the progress made and note any challenges.

7.2. Reporting

Annual reporting requirements for Provinces as per the Amended Waste Act, section 13 (1)(2), Reporting on implementation of IWMPs will be adhered to. In addition to this the Provincial Department provides feedback annually to the DFFE via reporting templates.

Section 13 (3) of the Waste Act notes the requirement in Section 46 of the Municipal Systems Act (32 of 2000) for municipalities to compile annual performance reports. Section 13 (3) also specifically requires that annual performance reports must contain information on the implementation of the IWMP and provide feedback on this.

8. References

Blaauw, P. F.; Pretorius, A. M.; Schenck, C. J. and Viviers, W. The impact of the recycling industry on poverty levels in South Africa's informal economy: a case study of waste pickers in Pretoria.

Bouwman, H; Minnaar, K.; Bezuidenhout, C. and Verster, C. 2018. Microplastics in freshwater water environments: a scoping study.

Bucci, K.; Tulio, M. and Rochman, C. M. 2020. What is known and unknown about the effects of plastic pollution: A meta-analysis and systematic review. *Ecological Applications*. 30(2): 1-14.

Council for Scientific and Industrial Research . n.d. Integrated Waste Management. <https://www.csir.co.za/integrated-waste-management>, viewed: 27 July 2021.

Council for Scientific and Industrial Research. 2021. The circular economy as development opportunity. Exploring circular economy opportunities across South Africa's economic sectors.

Department of Environmental Affairs. 2017. Operation Phakisa: chemicals and waste economy: lab outcomes. https://www.environment.gov.za/sites/default/files/docs/operation_phakisa_wastephakisa_lab_outcomes.pdf.

Department of Environmental Affairs and Development Planning. 2016. The mini guide to the management of abattoir waste.

Department of Environmental Affairs and Development Planning. 2019. A guide to separation of waste at source.

Department of Environmental Affairs and Development Planning. 2020. A practical guide to mainstream gender in public policy in DEA&DP.

Department of Environmental Affairs and Development Planning. 2020. Waste Collection and Transportation Status Quo Report.

Department of Environmental Affairs and Development Planning. 2021. Western Cape Climate Change Response Strategy: Gender Gap Analysis.

Department of Environmental Affairs and Development Planning. 2022. The Draft 2050 Emissions Pathway Analysis for the Western Cape: 2018 Baseline GHG Emissions Profile

Department of Environment, Forestry and Fisheries. 2020. A Circular Economy Guideline for the Waste Sector. https://www.dffe.gov.za/sites/default/files/docs/circulareconomy_guideline.pdf

Department of Forestry, Fisheries and the Environment. N.d. About the Green Economy <https://www.environment.gov.za/projectsprogrammes/greeneconomy/about>.

Department of Forestry, Fisheries and the Environment and Department of Science and Innovation. 2020. Waste Picker Integration Guideline for South Africa. Building the recycling economy and improving livelihoods through integration of the informal sector. <https://wasteroadmap.co.za/wp-content/uploads/2021/02/Waste-Picker-Integration-Guidelines.pdf>.

Department of Housing. 2016. From precarious settlements to dignified communities. Western Cape Informal Strategic Framework.

Republic of South Africa. n.d. Human Settlements. Available: <https://www.gov.za/about-sa/humansettlements>. [30 January 2022].

Department for International Development, n.d. Growth: Building jobs and prosperity in developing countries. <https://www.oecd.org/derec/unitedkingdom/40700982.pdf>.

Department of Water and Sanitation. Guidelines for the handling, treatment and disposal of abattoir waste. https://www.dws.gov.za/Documents/Policies/WDD/AbattoirWasteHandling_Disposal.pdf.

de Souza Mechado, A. A.; Kloas, W.; Zarfl, C.; Hemple, S. and Rillig, M. C. 2017. Microplastics as an emerging threat terrestrial ecosystems. *Global Change Biology*. 24: 1405-1415.

ECD, MONREC .2018: National Waste Management Strategy and Master Plan for Myanmar, the Republic of the Union of Myanmar, Nay Pyi Taw, Mya.

Ellen Macarthur Foundation. 2014. Towards the circular economy. Volume 3: Accelerating the scale-up across global supply chains. Available: <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Towards-the-circular-economy-volume-3.pdf> Accessed 30 April 2021.

Ellen Macarthur Foundation. 2017. The circular economy in detail. Available: https://www.ellenmacarthurfoundation.org/explore/the-circular-economy-in-detail?gclid=Cj0KCQjwsqmEBhDiARIsANV8H3YtkixrCgZtizGPOXM2l0eK1GsTsaKrVjUesKFjXnpO16WBOb1D8cQaAgbbEALw_wcB Accessed 30 April 2021.

Ellen Macarthur Foundation. n.d. The butterfly diagram: visualising the circular economy. <https://ellenmacarthurfoundation.org/circular-economy-diagram>

European Bank. 2011. Mainstreaming gender in waste management projects. <https://www.ebrd.com/news/2011/mainstreaming-gender-in-waste-management-projects.html>.

European Environment Agency (EEA). 2012. The European Environment: State and Outlook 2010.

Forbes, 2015. Top 10 things everyone should know about women consumers. Available at: <https://www.forbes.com/sites/bridgetbrennan/2015/01/21/top-10-things-everyone-should-know-about-women-consumers/?sh=1520a2036a8b>.

Gender CC. n.d. Waste, gender and climate. <https://www.gendercc.net/gender-climate/waste.html>.

Ghana National Plastic Action Partnership (NPAP). 2021. Gender analysis of the plastics and plastic waste sectors in Ghana.

Godfrey, L.; Strydom, W., Muswema, A., Oelofse, S., Roman, H. and Mange, M. 2014. Understanding the South African Waste Sector: The Economic and Employment Opportunities it Provides. Proceedings of the 20th WasteCon Conference 6-10 October 2014. Somerset West, Cape Town. <https://iwmsa.co.za/sites/default/files/downloads/Godfrey%2C%20L.%20et%20al%202020.pdf>

GreenCape. 2020a. Industry Brief - Food loss and waste: A case for reduction, recovery and recycling. Available: <https://www.greencape.co.za/content-2/industry-brief-food-loss-and-waste-a-case-for-reduction-recovery-and-recycling/> [25 January 2021].

GreenCape. 2020b. Waste market intelligence report. *Procedia Environmental Sciences*.

Larsen, K., Delgado, M., and Marsters, P. 2015. Untapped potential: reducing global methane emissions from oil and natural gas systems. Available: https://www.globalmethane.org/documents/Untapped_Potential_Reducing_Global_Methane_Emissions_Oil_Natural_Gas_Systems_ENG_April_2015.pdf.

Mukherjee, A., Debnath, B. and Ghosh, S.K. 2016. A review of technologies of removal of dioxins and furans from incinerator flue gas. *Procedia Environmental Sciences*. 35: 528-540.

Maleka, T. and de Wet, P. 2020. Helping South Africa's waste pickers face the Covid-19 crisis and beyond. <https://www.unido.org/stories/helping-south-africas-waste-pickers-face-covid-19-crisis-and-beyond#:~:text=South%20Africa%20has%20more%20than,collecte%20on%20an%20annual%20basis.&text=UNIDO%20also%20donated%20a%20four,working%20environment%20for%20waste%20pickers>. Accessed 27 July 2021.

Mathelon, A and Hill, P. 2014. Microplastic fibers in the intertidal ecosystem surrounding Halifax Harbor, Nova Scotia. *Marine Pollution Bulletin*. 81: 69-79.

Partnership for Action on the Green Economy (PAGE). 2019. Sustainable consumption and production. 10-11 January https://www.tips.org.za/images/Sustainable_Consumption__Production.pdf

Provincial Treasury. 2020. Provincial review and economic outlook. Cape Town: Western Cape Government.

Republic of South Africa, 2021. Environment, Forestry and Fisheries on amendment of Regulations and Notices regarding extended producer responsibility in the waste sector, 2020 <https://www.gov.za/speeches/environment-forestry-and-fisheries-amendment-regulations-and-notices-regarding-extended#>.

Seadon, J. 2006. Integrated Waste Management- looking beyond the solid waste horizon. *Waste Management*. 26(12): 1327-36.

United Nations Environment Programme, 2010. Waste and Climate Change. Global trends and strategy framework. <https://wedocs.unep.org/bitstream/handle/20.500.11822/8648/Waste&ClimateChange.pdf?sequence=3>.

SETAC. 2019. Plastic pollution: a breakdown. Available: chrome-extension://efaidnbnmnibpcjpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fcdn.ymaws.com%2Fwww.setac.org%2Fresource%2Fresmgr%2Fpublications_and_resources%2Fsetac_science_brief_plastics.pdf&clen=2207604&chunk=true. Accessed 21 January 2022.

Statistics South Africa. 2021. Municipal dependence on national government financing. <https://www.statssa.gov.za/?p=14537>. Accessed 25 May 2022.

Statistics South Africa. 2021. Quarterly Labour Force Survey (QLFS)- Q3:2021. <https://www.statssa.gov.za/?p=14957>

United Nations Environment Programme, n.d. Sustainable consumption and production policies. <https://www.unep.org/explore-topics/resource-efficiency/what-we-do/sustainable-consumption-and-production-policies>.

United Nations Environment Programme. 2015. Sustainable Consumption and Production. A handbook for policymakers. <https://sustainabledevelopment.un.org/content/documents/1951Sustainable%20Consumption.pdf>.

World Health Organisation. 2014. Self-management of waste from health care activities. 2nd edition. https://www.euro.who.int/__data/assets/pdf_file/0012/268779/Safe-management-of-wastes-from-health-care-activities-Eng.pdf.

United Nations Environment Programme, 2019. Gender and waste nexus: Experiences from Bhutan, Mongolia and Nepal.

United Nations Industrial Development Organisation. 2017. Circular economy.

United States Environmental Protection Agency. 2016. Wastes- non-hazardous waste-municipal solid waste. Environmental effects. <https://archive.epa.gov/epawaste/nonhaz/municipal/web/html/env.html>

Vijoen, K.; Blaauw, P. and Schenck, R. 2016. "I would rather have a decent job": Potential barriers preventing street-waste pickers from improving their socio-economic conditions. *South African Journal of Economic and Management Sciences*. 19(2):175-1.

World Economic Forum (WEF). What do we mean by 'governance'? <https://www.weforum.org/agenda/2016/02/what-is-governance-and-why-does-it-matter/>. Accessed 24 May 2022.

Dear stakeholder

The Department of Environmental Affairs and Development Planning cordially invites you to participate in our first public participation workshop for the Development of the Western Cape Integrated Waste Management Plan (2022 – 2027), WC IWMP.

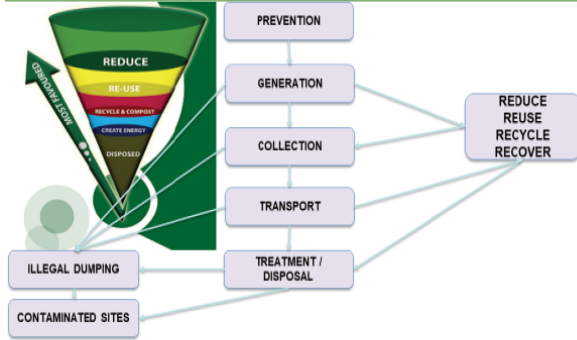
Date: 24 February 2022

Time: 09:00 – 12:00

Venue: Microsoft Teams – Webinar

RSVP: Martha.Strydom@westerncape.gov.za

Waste Management Hierarchy



The workshop will provide an update on the development of the WC IWMP and will allow stakeholders to participate in discussions on:

1. challenges with the waste system
2. climate change
3. circular economy
4. job creation, poverty reduction
5. gender and human rights

Public Participation Workshop Invitation Sent to Stakeholders

Email: August.Hoon@westerncape.gov.za

Tel: +27 21 483 2712

Department of Environmental Affairs and Development Planning

Chief Directorate: Environmental Quality

Directorate: Waste Management

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**Western Cape
Government**