



Western Cape
Government

Department of Environmental Affairs and
Development Planning

Western Cape State of Environment Outlook Report 2024

July 2024



STATE OF ENVIRONMENT OUTLOOK REPORT 2024

Reporting Period:

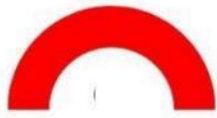
2019 - 2024

Sustainability Performance

Declining



Biodiversity



Inland Water

Concern



Air Quality



Waste Management



Energy

Stable



Land & Agriculture



Oceans & Coast



Human Settlements
& Infrastructure

Outlook Statement

The sustainability outlook for the Western Cape reveals a mixed scenario of progress and ongoing challenges. Despite improvements in protecting biodiversity through increased conservation area, biodiversity is threatened by a declining ecosystem status for the Western Cape, the inadequate management of invasive alien plants, and ongoing habitat loss, particularly of threatened ecosystems. Urgent action is needed to address coastal issues such as ecosystem transformation, pollution, and declining fish resources. Water scarcity poses significant risks to ecological reserves, agricultural production, infrastructure, and the economy, while waste management facilities are critically overburdened, exacerbated by regulatory non-compliance and service delivery challenges. Although air quality of the province is stable, its monitoring is in a state of decline. On a positive note, provincial sustainability is supported by renewable energy initiatives, agricultural responses to climate change, alongside improving settlement and housing quality. However, balancing land transformation, overcoming fiscal and economic constraints, and adapting to climate change are crucial for achieving long-term resilience and equitable development in the region.

Purpose

State of Environment Outlook reporting shows how the Western Cape is handling environmental, climate, social and development pressures. It is crucial for guiding governance and impact management.

Provincial change

Notable changes across human settlements, agriculture, air quality and the biophysical environment are recorded; these align with the latest population statistics confirming rapid growth of the province.

Human Rights & Gender

To enhance the DPSIR framework, a Human Rights and Gender lens was applied to the state of environment and aspects of programme or policy development and implementation in the province.

Action Points

Each theme identified 'critical action points' which must be responded to for the outlook to improve - and the majority of these are within provincial mandate.

Contents

Western Cape State of Environment Outlook Report 2024	3
Chapter 2 The Western Cape Province.....	10
Chapter 3 Western Cape Sustainability.....	11
Chapter 4 Biodiversity.....	20
Chapter 5 Oceans & Coast	26
Chapter 6 Inland Water	32
Chapter 7 Air Quality	37
Chapter 8 Energy	41
Chapter 9 Human Settlements & Infrastructure.....	47
Chapter 10 Land & Agriculture	56
Conclusion.....	67
References.....	68



Western Cape State of Environment Outlook Report 2024

The Western Cape State of Environment Outlook Report (SoEOR) 2024 is the fourth comprehensive report on environmental trends in the province. The first report, the Western Cape State of Environment Report – Year One baseline report was published in 2005, reporting on fourteen themes related to natural, social and economic aspects of sustainable development.

The second report, the Western Cape State of Environment Outlook Report 2013, took account of ongoing refinements to environment and sustainability reporting protocols, and the need to standardize State of Environment (and other similar) reports and align reporting structure with the National Environmental Outlook Report. The themes were consolidated and reduced to nine, largely scaling down socio-economic reporting in the SoEOR, so as to avoid duplication of more focused social and economic reporting in the province.

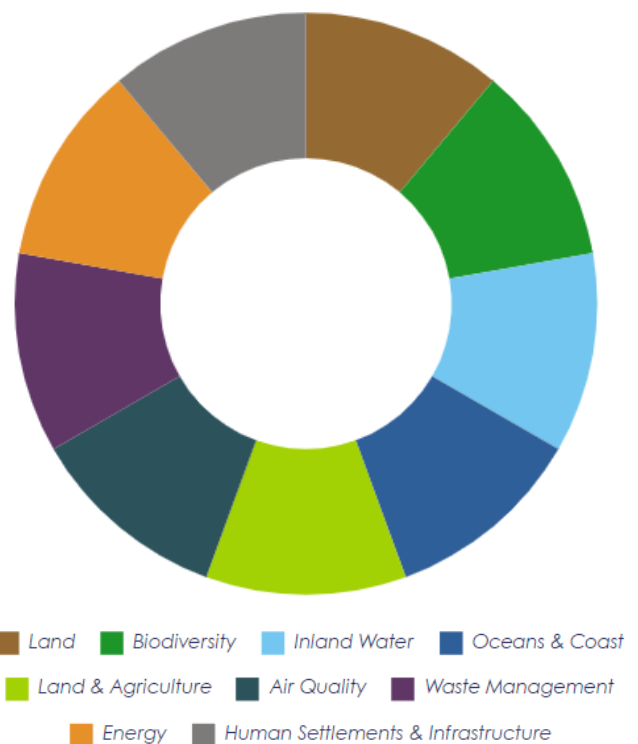


Figure 1 Western Cape State of Environment Outlook Report - Themes

Previously, changes and trends relating to the nine environmental themes were reported against preceding State of Environment Outlook Reports. Each reporting period were accompanied by the identification of emerging trends. The nine themes, as retained since the 2013 iteration of the Western Cape State of Environment Outlook Report, are provided in Figure 1. The Western Cape State of Environment Outlook Report, as required in terms of section 16A (1) of the National Environmental Management Act 107 of 1998 (NEMA), is in its fourth generation and fourth reporting cycle. The Western Cape has a strong record of publishing the State of Environment Outlook Reports since the early 2000s, bringing a favourable opportunity to refine the scope, objectives and outcomes of the State of Environment Outlook Report, as an instrument towards identifying and responding to the Western Cape's sustainability trends of concern. In addition to the State of Environment Outlook Reporting, the Western Cape Government incorporates sustainable development targets and indicators in its strategic development planning and operational targets. At municipal level, Councils should include the indicators within their annual service delivery budget implementation plans which are linked to Integrated Development Plans (IDPs).



“The Western Cape State of Environment Outlook Report is now in a transformational position as it is the first reporting cycle that has been developed and compiled by internal components within the DEA&DP, with acknowledgement to the support required from other contributing Departments, according to the desired sustainability themes and indicators.” – DEA&DP ‘State of’ Visioning Workshop (August, 2023)

1.1. Indicators

This Western Cape State of Environment Outlook Report follows on the 2017/2018 iteration, published in 2018. This report reviews the data of the period 2019-2024, pending availability of information. One of the strongest assets of this Western Cape State of Environment Outlook Report is that it has maintained its indicators since the early 2000s which places the Western Cape in a good position to track the environmental and socio-economic attributes of its 'environment' over a period of time. These indicators have their origin in the National Framework for Sustainable Development (NFSD) as the broad framework that provides and enables policy for sustainable development; and followed by the National Strategy for Sustainable Development and Action Plan 1 (NSSD, 2011-2014) and the NSSD2 (2015-2020). Five priorities for sustainable development, from which these State of Environment Outlook Report indicators have been formulated, are as follows:

- 1. Enhancing systems for integrated planning and implementation**
- 2. Sustaining our ecosystems using natural resources efficiently**
- 3. Enabling and growing towards a green economy**
- 4. Building sustainable communities**
- 5. Responding effectively to climate change**

The above five priority areas provide an on-going basis for the long-term process of integrating sustainability as a key component of sustainable development in South Africa.

For the majority of this Western Cape State of Environment Outlook Report 2024, the indicators have remained unchanged from previous generation Western Cape State of Environment Outlook Reports and are herewith updated to provide information to collectively describe the 'Western Cape state of environment'.

How to interpret the indicator summaries

Indicators are the key to any environmental reporting as they allow for a baseline to be set against which

Global examples demonstrate that active public engagement, including citizen-based monitoring, is effective in environmental policymaking. However, State of the Environment reports often lack collaborative stakeholder involvement in data collection and assessment, with current practices primarily focused on different report formats for various audiences. There is a need to explore and integrate participatory techniques into State of Environment reporting processes, enabling stakeholders to actively contribute to design, data gathering, and evaluation, potentially mirroring the success seen in other environmental decision-making contexts.

change can be tracked over time. Within each chapter, issues are identified that are representative of the overall state or health of that environmental attribute. Each issue is then measured according to quantifiable indicators that will show change to that facet of the environment.

The indicators therefore highlight a trend in the environmental or socio-economic attributes in a summarised form, visually indicated by arrows (outcomes offered in conclusion of each environmental attribute with designated chapter) that describe the change of state since the last reporting iteration, in this case, 2018. An upward arrow indicating an improved state, a downward arrow indicating a declining state and a horizontal arrow indicating an unchanged state of lack of supporting data (which will be specified where applicable).

1.2. DPSIR Methodology

As per previous Western Cape State of Environment Outlook reports, the Western Cape State of Environment Outlook Report 2024 reports on the state of the environment specifically for the Western Cape based on the internationally accepted DPSIR framework, and also specifically accepted towards outlook reporting (Figure 2). The framework acts as an effective way to provide a "big picture" snapshot of the state of the environment. Adopted by the United Nations, this framework considers causal links, with feedback at the end of the cycle to revisit and reset the start point.

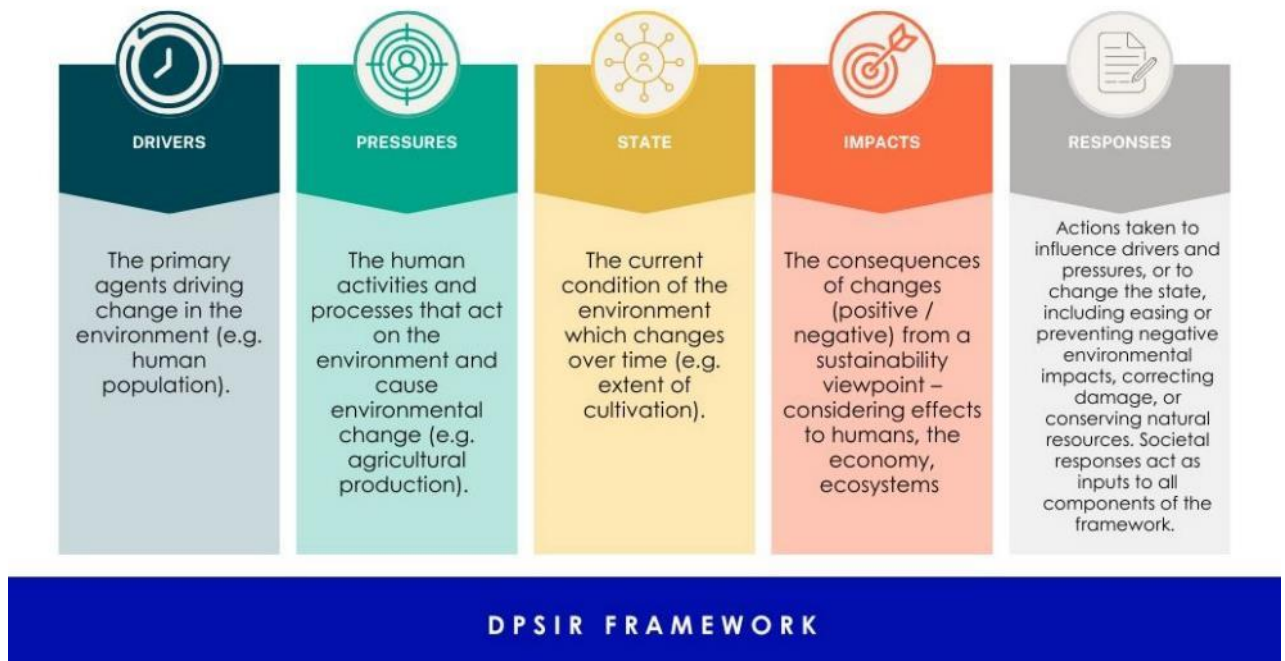


Figure 2 Unpacking the DPSIR Framework

(Source: DEA&DP, 2024)

To achieve the objectives outlined in respectively NEMA, National Development Plan (NDP) and the requirements of State of Environment Outlook reporting, a conceptual framework is essential for conducting the 'state of' assessments. Essentially a sustainability framework, it must encompass the complex, non-linear relationships among human activities, environmental pressures, states, and impacts, as well as the political responses to these perceived issues. Furthermore, the approach to framing social-ecological systems and responses need an agreed framework. One such tool originally developed by the Organization of Economic Cooperation and Development is the so-called Drivers-Pressure-State-Impact-Response (DPSIR) framework (OECD, 1993).

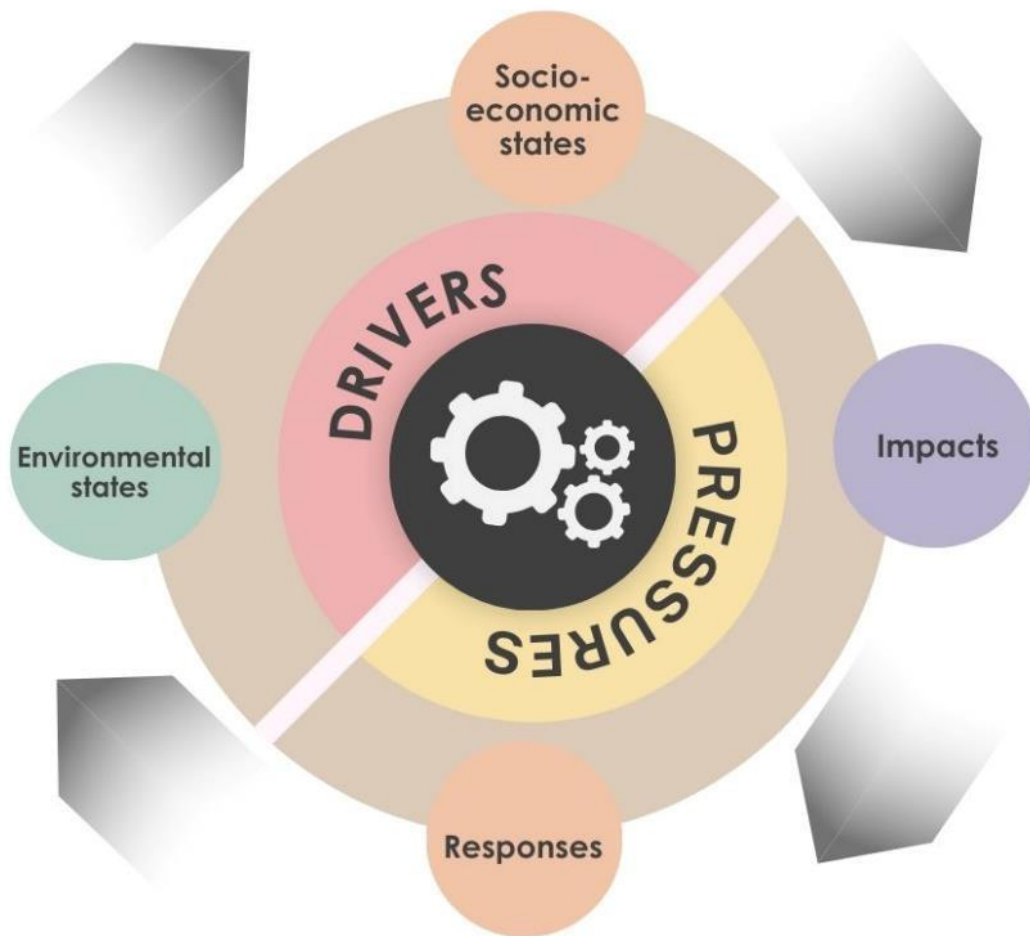


Figure 3 DPSIR framework applied to the Western Cape State of Environment Outlook Report

(Source: DEA&DP, 2024)

Application of the DPSIR framework allows for cause-effect relationships to be framed and analysed, supported by the five categories of the DPSIR framework. Its key strength is the highlighting of important interlinked relationships between environmental factors. For example, the DPSIR framework is a good analytical framework for assessing complex natural resource

issues such as freshwater management which looks at continuously fluctuating complex aquatic ecosystems and its relationship to surrounding populations. In such cases, it is useful to be able to examine the state of - and impacts on - these ecosystems, not just in the present but also through time.

Although it is a well-received and applied as a popular framework internationally, it is also known for specific limitations – which are described in the section below.

1.3. Enhancing the DPSIR Framework: Human Rights & Gender lens

Although the DPSIR framework is considered a valuable tool, it is not without limitations and suggestions for improvements including combining the framework with other methods or opening up the framework for improved understanding of the impact on humans and society and interlinked nature between social components and environmental states. To this end, there is also a retrospective view from having applied the DPSIR framework in State of Environment Outlook reporting that it omits socio-economic considerations if applied for the understanding of solely ecological systems (DEA&DP, 2018). This Western Cape State of Environment Outlook Report 2024 has taken the step to enhance the DPSIR framework by incorporating and applying a Human Rights and Gender Lens to the state of environment and aspects of programme or policy development and implementation in the province. Enhancing the DPSIR framework in this instance has relied notably on the resource *A Practical Guide to Mainstream Gender into Public Policy in DEA&DP* (2020). In reviewing the DPSIR framework, this guide has been applied as a 'a tool for position-enablement – both in policy-formulation – and for consistency when positioning departmental response(s)'.

Throughout this Western Cape State of Environment Outlook Report 2024, reference will be made to relevant legislative and policy guides, data and information that have been applied in the respective themes and indicators to generate understanding on norms, values, standards and policy imperatives as it relates to the interlinkage between human rights, gender and environmental matters (Camey et al., 2020). This represents a concerted effort to place focus on the still-overlooked interlinkage between human rights, gender and environmental contexts. The importance hereof is critical – **it has been identified that patterns of gender-based violence (GBV) are observed across environmental contexts, affecting the security and well-being of nations, communities and individuals, and jeopardising meeting sustainable development goals (SDGs)** (IUCN, 2020). It is further recognised that linkages between GBV and environmental issues are complex and multi-layered, yet it translates into threats to human rights and healthy ecosystems (IUCN, 2020).

By enhancing the DPSIR framework by means of a Human Rights and Gender lens approach specific to the themes addressed in this Western Cape State of Environment Outlook Report

2024, therefore doubles as a demonstrated means of highlighting that ending GBV, promoting gender equality and protecting the environment can be positively interlinked through ways that contribute to securing a safe, sustainable and equitable future.

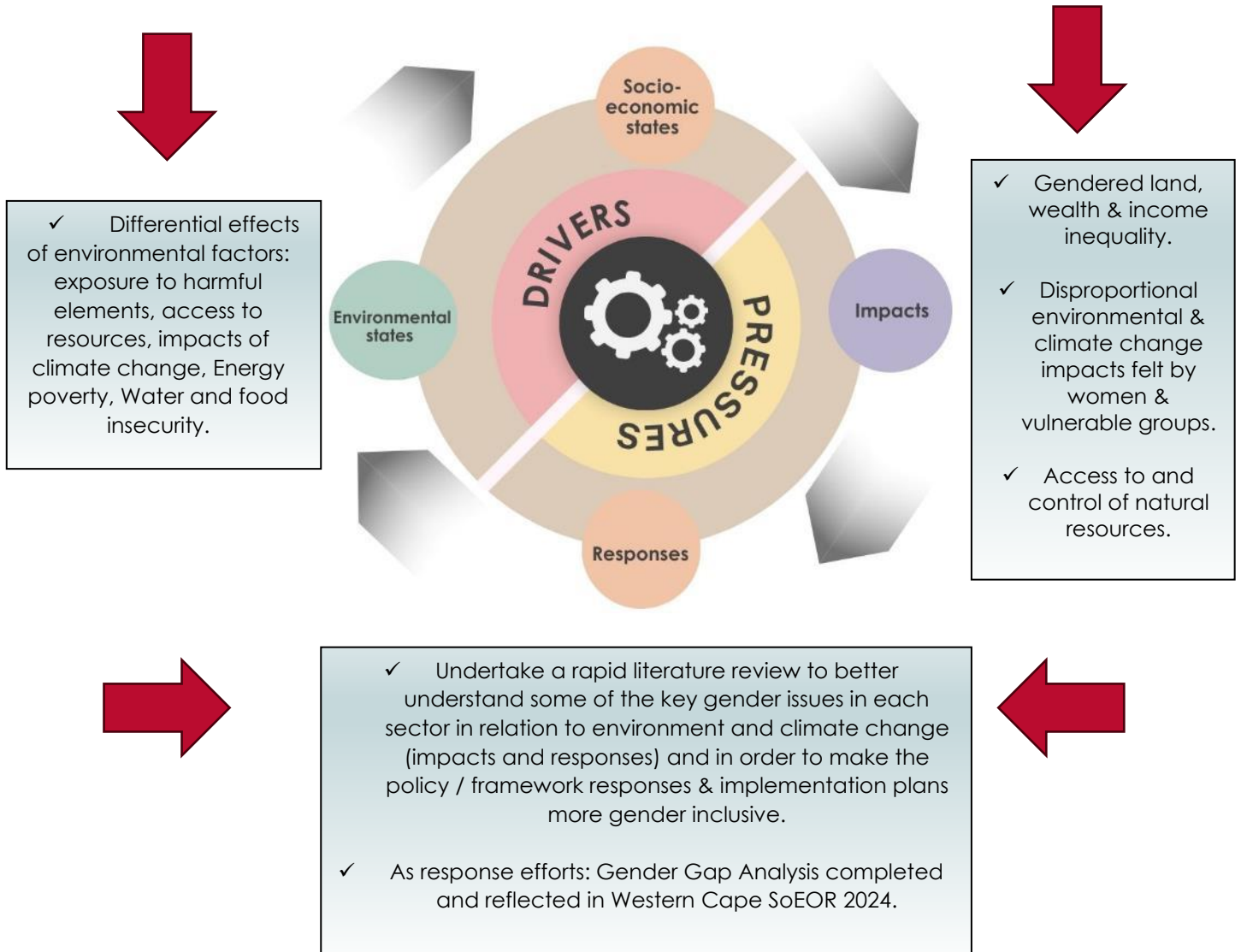


Figure 2 Enhancing the DPSIR framework through a Gender & Human Rights Approach

(Source: DEA&DP, 2024)



Chapter 2 The Western Cape Province

The Western Cape lies on the southern tip of Africa and represents 10.6% of South Africa's total land area, encompassing 129 462km². The Western Cape stretches from beyond Strandfontein on the West Coast, around the Cape Peninsula and Cape Point, to Nature's Valley along the Garden Route on the South Coast.

The Western Cape Province comprises one Metropolitan Municipality - the City of Cape Town (CCT) - and five district municipalities namely West Coast, Cape Winelands, Overberg, Garden Route and Central Karoo. The District Municipalities comprise of 24 Local Municipalities.

The Western Cape has moved from being the 5th-largest province in terms of population size in 1996 to being the 3rd largest in 2022 (StatsSA, 2023). The Western Cape has an estimated population of 7.4 million, accounting for nearly 12% of South Africa's population (StatsSA, 2023). The Western Cape's growing population is largely attributable to in-migration from other provinces and immigration. The rapid population growth is more meaningful than the total population and therefore **growth rate of the Western Cape** and changing provincial population ranking compared to other provinces, must be highlighted particularly as a driver of environmental change. **Socio-economic** conditions in the Western Cape have continued to show relative improvement compared to other provinces, as indicated by ongoing in-migration and positive perceptions from residents. The Western Cape State of Environment Outlook Report 2024 data review highlighted progress in basic service delivery, education, and lower unemployment rates.



Chapter 3 Western Cape Sustainability

Key Challenge: How can the State of Environment Outlook reporting system guide sustainability for the Western Cape?

South Africa, and the Western Cape, is uniquely positioned in its quest towards a more sustainable world. At national level, there is a well-defined policy environment that supports an ecological framing of sustainability – which underpins a functioning and healthy natural environment as the basis for a just and thriving society, and a resilient economy.

It is widely understood that the concept of sustainability may imply ambiguity stemming from its broad definition across environmental, social and economic realms. These difficulties and ambiguity translate into implementation challenges – and the prospects of achieving sustainability¹. At its broadest definition and within the framework of the Brundtland Report², sustainability points to the need and potential of a renewed economic era where economic growth is aligned to the available environmental resource base and the well-being of society, both current and future. Putting forward these ideals have also come with uncertainties as some school of thoughts believe that the scale of human pressure on the natural environment has already exceeded a 'sustainable level' with stark challenges giving a world population that is currently on a trajectory of reaching 10 billion people by late 2050³.

¹ Toman, M. A. (2010). The difficulty in defining sustainability. In *The RFF reader in environmental and resource policy* (pp. 267-272). Routledge.

² Brundtland, G. (1987). Report of the World Commission on Environment and Development: Our Common Future. United Nations General Assembly document A/42/427.

³ UN World Population Projections. <https://www.un.org/en/desa/world-population-projected-reach-98-billion-2050-and-112-billion-2100>

The future world population of 10 billion will face an already stressed environmental system and a changing climate system, patterns of exhaustive resource consumption and waste generation, pollution and discharge levels which the environmental system cannot absorb without major degradation and impact. To achieve a changed position, 'sustainability' can be equated to "sustainable development", which denotes development that meets the needs of the present without compromising the ability of future generations to meet their own needs⁴. Most commonly, sustainable development is intrinsically linked to the United Nations Sustainable Development Goals, the so-called "SDGs", that identify global sustainability outcomes in 17 thematic areas. Similar to the UN Sustainable Development Goals (SDGs), the indicators captured in a State of Environment Outlook Report are a set of measures to understand the progress towards sustainable development. State of Environment Outlook reporting therefore holds a key function in enabling sustainability. The trends that outlook reporting highlight show how the Western Cape (and beyond for transboundary impacts such as climate change) is managing the pressures placed on its natural environment, and how well it is being managed. This is a key informant to environmental governance, closing the impact management loop.

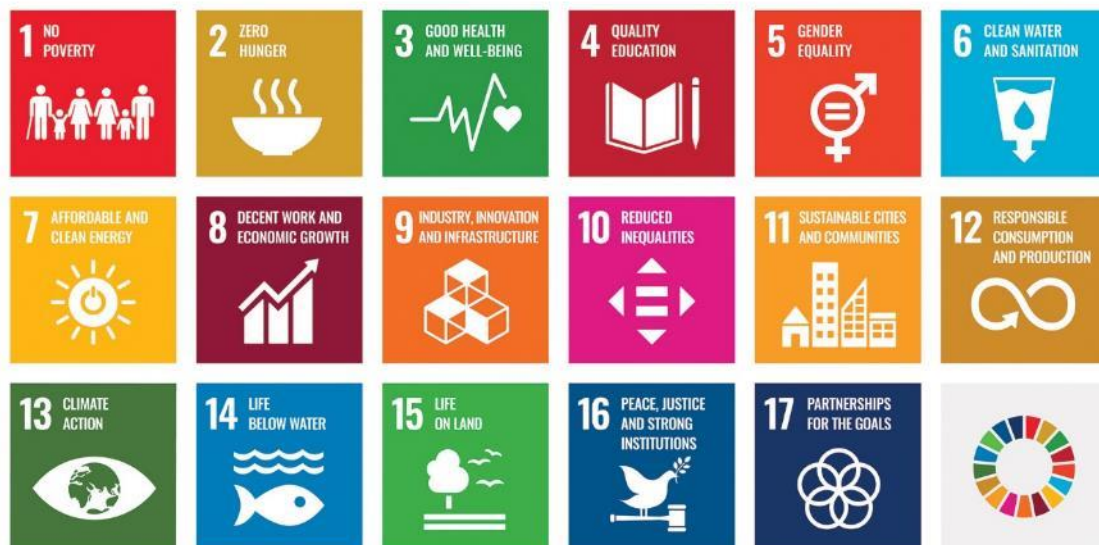


Figure 3 United Nations Sustainable Development Goals

(Source: United Nations Sustainable Development Goals⁵)

⁴ [Sustainable Development | International Institute for Sustainable Development \(iisd.org\)](https://www.iisd.org/)

⁵ <https://www.un.org/sustainabledevelopment/blog/2015/12/sustainable-development-goals-kick-off-with-start-of-new-year/>

A healthy, functional and resilient ecosystem is the foundation for societal well-being and economic functioning (Figure 6). This approach is also adopted by the New Growth Path (2010) and the more recent economic development strategy with the Economic Reconstruction and Recovery Plan (ERRP) (2020) which builds upon the foundations of the NGP (2010) but responds to current economic challenges, particularly those exacerbated by the COVID-19 pandemic.

Sustainable development is a broad and encompassing framework that recognises the interdependency of economic growth, social equity and environmental integrity.

The fundamentals of environmental sustainability

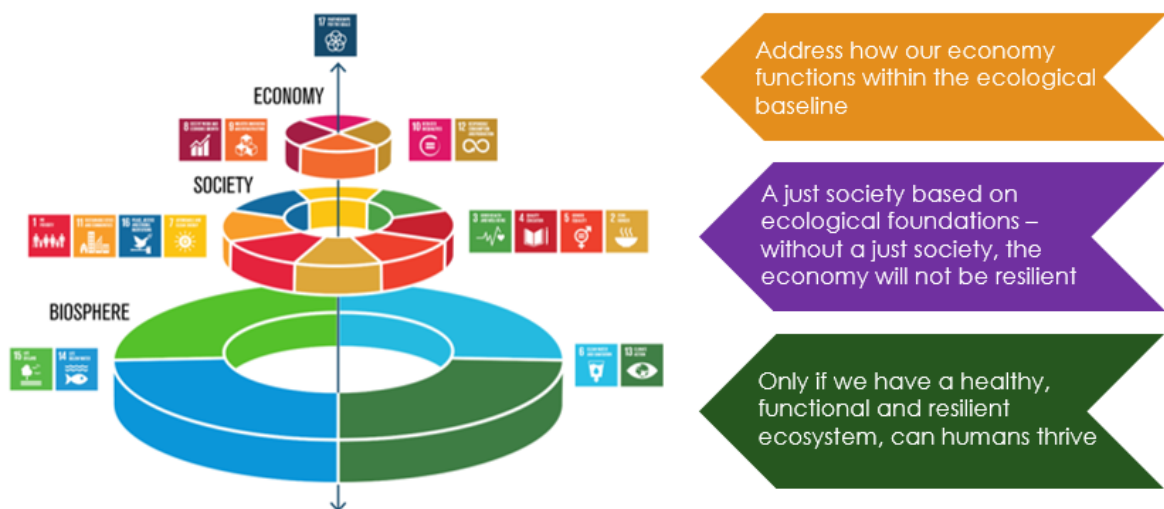


Figure 4 Layered approach to SDG implementation








(Source: Rockström and Sukhdev, 2017, Stockholm Resilience Centre)

These plans align with the sustainable development foundation principles to support South Africa as it grows in a more equitable and inclusive manner and thereby delivering sustainable development.

3.1. Drivers of Sustainable Development in South Africa

For South Africa, sustainable development is framed in the NDP, “Vision 2030”. The table below shows the overlap in NDP 2030 outcomes and the SDGs, illustrating how sustainable development is embedded in South Africa’s development plan:

Table 1 Overlap between the NDP 2030 outcomes and the UN SDGs

	ECONOMY & EMPLOYMENT	SDG 1 - Poverty	SDG 2 - Food security	SDG 4 - Education	SDG 8 - Work & Economic Growth	SDG 13 - Climate Action
	ECONOMIC INFRASTRUCTURE	SDG 8 - Work & Economic Growth	SDG 9 Industries & Innovation & Infrastructure	SDG 12 - Consumption & Production	SDG 13 - Climate Action	SDG 17 - Partnerships
	EDUCATION TRAINING & INNOVATION	SDG 4 - Education	SDG 5 - Gender Equality	SDG 10 - Reduced Inequalities	SDG 17 - Partnerships	
	HEALTH CARE & SOCIAL PROTECTION	SDG 2 - Food security	SDG 3 - Health & Well-being	SDG 5 - Gender Equality	SDG 10 - Equality	SDG 16 - Peace, Justice & Institutions
	TRANSFORMING SETTLEMENTS	SDG 3 - Health & Well-being	SDG 10 - Reduced Inequalities	SDG 11 - Cities & Communities	SDG 13 - Climate Action	SDG 16 - Peace, Justice & Institutions
	ENVIRONMENT	SDG 6 - Water & Sanitation	SDG 7 - Affordable and clean energy	SDG 13 - Climate Action	SDG 14 - Oceans & Coast	SDG 15 - Terrestrial
	CAPABLE & DEVELOPMENTAL STATE	SDG 16 - Peace, Justice & Institutions	SDG 17 - Partnerships			

Source: DEA&D (2024)

The NDP thus demonstrates a fair attempt at implementing the UN SDGs. The National Development Plan (NPC 2012) is most clear in this regard as it defines sustainable development as fulfilling the functions of (1) maintaining economic activity, (2) improving social well-being and (3) avoiding depleting or harming of the natural environment over time. Figure 6 visually illustrates the interlinked nature between environmental sustainability, social well-being and economic stability.

At provincial level, progress towards sustainable development can be recognised in this updated Western Cape State of Environment Outlook Report.

The Western Cape must also follow the pathways through which emerging economies should aim to progress to sustainable development⁶. Although at strategic level there are various

⁶ Hoosain, M. S., Paul, B. S., Doorsamy, W., & Ramakrishna, S. (2023). Comparing South Africa's Sustainability and Circular Economic Roadmap to The Rest of the World. *Materials Circular Economy*, 5(1), 2.

good governance frameworks that enable sustainable development, and there are various implementation opportunities that could be ramped up for sustainable outcomes – many of which are reflected in this Western Cape State of Environment Outlook Report.

This scenario is also reflected nationally and one example to illustrate is the limited application of recycled raw materials. According to a 2021 report by the national Department of Forestry, Fisheries and the Environment, less than 10% of post-consumer plastic waste is recycled, compared to global averages that exceed 20%. This low recycling rate is compounded by the lack of investment in advanced recycling technologies and the underdevelopment of secondary markets for recycled materials. A key obstacle identified is the cost of implementation⁷. Addressing these issues requires coordinated efforts between government, industry, and communities to enhance recycling infrastructure, develop supportive policies, and foster market demand for recycled goods.

Following the analysis of the 2019 Voluntary National Review conducted in collaboration with the United Nations, the National Planning Commission of South Africa, and Statistics South Africa, it was evident that South Africa has placed a strong emphasis on achieving the Sustainable Development Goals (SDGs), demonstrating significant strides since the advent of democracy in 1994. Improvements have been noted in living conditions for millions, with enhanced access to clean water, energy, sanitation, health, and education. Gender equality has also seen progress, exemplified by the increase in women holding key positions in parliament. Additionally, in alignment with the Paris Agreement, South Africa has invested in climate change mitigation, renewable energy, waste management, and land restoration. The country continues to invest in science and technology. The context is now favourably supported by the South African Climate Change Act (2024) which establishes a legal framework for reducing greenhouse gas emissions and enhancing climate resilience, aligning with international commitments. It includes provisions for national climate targets, sector-specific plans, monitoring and reporting, climate finance, and public participation to ensure effective climate action and accountability.

Despite these innovations and regulatory context, the efforts are at times inconsistent, with not all provinces moving ahead towards sustainability at the same speed. Challenges such as limited funding compared to developed nations, differing public mindsets, corruption, criminal activities, and lagging education levels hinder progress. A notable concern relevant to this discussion is South Africa's transition toward a circular economy and the need to reduce

⁷ Tahulela AC, Ballard HH (2019) Developing the circular economy in South Africa: challenges and opportunities. Sustainable Waste Management: Policies and Case Studies:125–133. https://doi.org/10.1007/978-981-13-7071-7_11

carbon emissions, given the continued reliance on fossil fuels. The next section will propose solutions for enhancing South Africa's sustainability and advancing towards a circular economy, drawing lessons from global best practices. A crucial factor in accelerating this process is government intervention. To address these challenges effectively, stricter policies need to be implemented and monitored regularly.

1.4. Enhancing Western Cape Sustainability

The previous section outlines the key drivers of sustainable development in South Africa as it lies at national level under the governance umbrella of the National Development Plan, the National Framework for Sustainable Development, the New Growth Path, the Economic Reconstruction and Recovery Plan etc. From this national governance level it cascades to provincial governance level, including provincial frameworks and priorities. In the Western Cape, sustainability is driven by a multifaceted approach that integrates environmental, economic, and social dimensions to address the region's unique challenges and opportunities. As an umbrella, the Western Cape has identified five 'Vision-inspired Priorities' (VIPs) which are a marked contribution to sustainable development implementation.

Climate change adaptation and mitigation is another critical driver, with the dual aim of reducing greenhouse gas emissions and adapting to the impacts of climate change. The promotion of renewable energy sources—such as solar, wind, and hydroelectric power—reflects a significant step toward transitioning away from fossil fuels and reducing carbon footprints. In parallel, sustainable land management practices, including responsible agricultural methods and urban planning that prioritises green spaces and efficient public transport, are essential to maintaining the region's environmental integrity.

Economic sustainability is supported by the Western Cape Growth4Jobs Strategy (2023) that includes multiple initiatives that encourage and foster a green economy. By encouraging businesses and industries to adopt sustainable practices, such as locally producing eco-friendly products and utilising green technologies, the Western Cape aims to build a robust economy that aligns with its environmental and climate goals. This approach also secures new job opportunities, particularly in the green sector, and supports skills training programs that prepare the workforce for sustainability-related roles.

Water resource management and water infrastructure management are pressing concerns, given the region's water scarcity issues and in light of climate change projections for the Western Cape. Efforts to promote efficient water use and expand the province's water

supplies through innovative technologies and practices are crucial. Additionally, the development of systems for water recycling and reuse helps to alleviate pressure on freshwater sources, ensuring a more sustainable approach to water management.

The province's commitment to waste management further reinforces its sustainability agenda. Comprehensive waste management systems, focusing on recycling and waste reduction, help to minimise environmental impact and promote responsible waste practices.

Community engagement and education are pivotal in driving sustainability. Public awareness campaigns and educational programs play a significant role in promoting sustainable behaviors and fostering a culture of environmental stewardship among residents. By integrating sustainability education into school curricula and community initiatives, the Western Cape aims to cultivate a culture of citizens involvement and responsibility.

Policy and governance also contribute to the region's sustainability efforts. The development and enforcement of policies that support sustainability goals - such as effective land use planning, waste management, and pollution control - are essential. Collaborative partnerships between government, businesses, non-profits, and local communities help to implement and advance these policies, addressing sustainability challenges through a united approach.

Lastly, building resilience to natural disasters and climate-related events is a key aspect of sustainability – and this is, as per Figure 6, supported on the pillar of resilient ecosystems.

Through these combined efforts—ranging from environmental conservation and renewable energy to economic growth and community engagement—the Western Cape is working to create a sustainable future that balances ecological health, economic resilience, and social well-being in the face of future change.

1.5. Climate Change

The climate change projections for the Western Cape⁸ indicate a consistent rise in mean annual temperatures, which will drive an increase in evapotranspiration. This temperature rise, coupled with the uncertain trend of decreasing rainfall, suggests a substantial decline in overall moisture availability. As a result, the province is expected to face a doubling in the likelihood of drought conditions within any given decade. Specifically, maximum temperatures are projected to rise more markedly during autumn and spring compared to winter and summer. Additionally, the increase in minimum temperatures is likely to reduce the number of

⁸ Jack et al. (2022) Updated Climate Trends and Projections for the Western Cape. Climate Systems Analysis Group, University of Cape Town.

frost days and chill units, a change that could have significant implications for agricultural practices.

According to the projections, the mean temperature across the province is expected to increase by approximately 1°C to 1.8°C by 2060, compared to the historical average from 1981 to 2010. In some SmartAgri Zones⁹, especially those farther from the coast, the increase could be as high as 2°C. The rise in mean daily minimum temperatures (night-time temperatures) is also expected to be substantial, with some inland areas like Nelspoort experiencing increases up to 2.7°C, which is even greater than the projected rise in maximum temperatures. Moreover, the number of hot days is set to increase significantly, with projections indicating an additional 5 to 30 days per year exceeding 30°C in inland zones such as Nelspoort.

When it comes to rainfall, the projections reveal a high degree of uncertainty. Some models suggest minimal reductions in annual rainfall across the province, while others predict decreases of up to 20%. In many SmartAgri zones, particularly during the summer months (December to February), there are projections of decreasing rainfall, though these changes often do not achieve statistical confidence. This uncertainty implies that while a trend towards drying is likely, natural variability may play a significant role, making it difficult to attribute all changes solely to climate change. In some areas like Matzikama, reductions in rainfall could reach as much as 40%.

Projections regarding the number of rainy days (days with more than 1mm of rainfall) show considerable uncertainty. The reductions in the number of wet days are not as pronounced as the reductions in total rainfall, suggesting that while fewer wet days are expected, the primary change will be a decrease in the amount of rainfall per event rather than a reduction in the number of events. Similarly, although there is an overall increase in the length of dry spells, the statistical significance of these changes is weak in most cases. However, some projections indicate significant increases in dry spell duration, up to 20 days in summer, although it should be noted that baseline dry spell durations are already relatively long in these areas. Additionally, specific seasonal increases in the intensity of rainfall events that lead to flooding, should not be discounted.

In terms of evaporation and drought indices, the projections show a consistent increase in Potential Evapotranspiration across all zones and models. This trend is largely driven by rising temperatures and aligns with observed data on Potential Evapotranspiration. Additionally, projections indicate a steady increase in the frequency of drought events, as measured by

⁹ Jack et al. (2022) Updated Climate Trends and Projections for the Western Cape. Climate Systems Analysis Group, University of Cape Town

the Standardised Precipitation Index (SPI) and the Standardised Precipitation Evaporation Index (SPEI). This increase is evident by mid-century, but particularly notable towards the end of the century, with a more rapid rise in drought frequency according to SPEI due to the combined effect of temperature-driven evaporation. For many clustered zones, a drought event currently occurring once every 10 years is projected to become a once-every-2-years event (5 times per decade) by mid-century, considering the impact of rising temperatures on evaporation rates.

Chapter 4 Biodiversity



BIODIVERSITY

OUTLOOK: DECLINING

GAINS



Some improvement was experienced in the ecosystem protection level of specific vegetation types due to the establishment of new conservation areas or the expansion of existing ones. The species threat status of some species has improved.

LOSSES



More species are deteriorating in their threat status as opposed to those improving in threat status, particularly relating to already-threatened species moving into higher threat categories. Overall decline in the ecosystem threat status of vegetation types, is primarily due to the loss of approximately 102 057 ha of habitat between 2017 and 2023.

CONCERNS



Unlawful habitat destruction in Critical Biodiversity Areas (CBAs) and Ecological Support Area (ESA) continues to contribute to biodiversity decline. Invasive alien plant species densities are increasing despite active invasive alien management effort driven by various role-players.

KEY TREND

- The impact on Western Cape biodiversity resources due to degradation continues, with safeguarding and restoration efforts not able to mitigate the overall decline. This continued loss of natural habitat, particularly in Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), undermines not only the rich natural heritage of the Western Cape, but our very livelihoods and quality of life, our water security, and our resilience in the face of a changing climate.



ECOSYSTEM THREAT STATUS

There is a current increase in threat status for some vegetation types due to habitat loss, which currently declines ecosystem status for the Western Cape.

There are currently positive increases in total conservation area and although total level of protection is increasing, it does not yet apply to all ecosystems with many remaining poorly or not protected at all.

ECOSYSTEM PROTECTION LEVEL



BIODIVERSITY PRIORITY AREAS

Losses are currently being experienced across CR, EN and VU ecosystems, as a result Western Cape biodiversity priority areas are in an unfavourable state of decline.

Habitat degradation is ongoing, and the concern is that the highest level of change is occurring in areas with the most threatened ecosystems.

HABITAT DEGRADATION



SPECIES THREAT STATUS

In the review period, up to 64 species have been uplisted to more threatened categories of the SA Red List.



SUSTAINABILITY WAY-FORWARD

- Expansion of conversation areas in the Western Cape
- Expand the number of well-protected ecosystems in the Western Cape
- Extended incorporation of vulnerable groups in biodiversity management across the province

Outlook: Declining

Key Challenge: The Western Cape's unique and threatened biodiversity resources are being depleted at a faster rate than what they are being safeguarded.

At present, the Western Cape's unique and threatened biodiversity resources are being depleted at a faster rate than they can be safeguarded. This continued loss of natural habitat, particularly in Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), undermines not only the rich natural heritage of the Western Cape, but our very livelihoods and quality of life, our water security, and our resilience in the face of a changing climate. It is vital that unlawful habitat destruction in CBAs is stopped with effective action taken against transgressors.

As per the Western Cape Biodiversity Spatial Plan (WC BSP), priority biodiversity areas in the province include Protected Areas, Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These are the most efficient suite of natural areas that need to be protected formally or informally to ensure a representative proportion of all ecosystems in the province persists in the long-term.

The province has seen a continuously downward trend in the ecosystem threat status of its vegetation types, primarily due to the loss of approximately 102,057 hectares of habitat between 2017 and 2023. While some species have shown improvements, some species in the endangered and critically endangered categories have experienced further deterioration, reflecting an ongoing negative trend.

Despite progress in ecosystem protection for specific vegetation types—thanks to the establishment of new conservation areas and the expansion of existing ones—the overall effectiveness of invasive alien plant management remains limited. Active management efforts are in place through various invasive alien plant programs, but inadequate funding and increasing densities of invasive species have hindered progress.

Threat Status Info Box

The threat status of species is categorised by the IUCN as follows:

- **Critically Endangered** species are considered to be facing extremely high risk of extinction in the wild in the immediate future;
 - **Endangered** species are considered to be facing a very high risk of extinction in the wild;
 - **Vulnerable** species are considered to be facing high risk of extinction in the wild;
 - **Near Threatened** species do not qualify as Critically Endangered, Endangered or Vulnerable now, but are close to qualifying for or are likely to qualify for a threatened category in the near future;
- Least Concern** species do not qualify as Critically Endangered, Endangered, Vulnerable or Near Threatened and include species which are widespread and abundant.

The continued degradation of Western Cape biodiversity resources is evident, with current safeguarding and restoration efforts unable to counteract the overall decline. This loss, especially in Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), threatens not only the province's rich natural heritage but also its livelihoods, water security, and climate resilience. Immediate and effective action is needed to halt particularly unlawful habitat destruction but also other deterioration and habitat destruction in CBAs and to hold transgressors accountable.

To address these challenges, greater effort is needed to integrate and prioritise the value and protection of biodiversity in all sectors. Achieving the Global Biodiversity Framework (GBF) 30x30 target¹⁰ is crucial, but without adequate resources and support for overextended biodiversity management entities, meeting these targets remains unlikely.

Biodiversity delivers valuable long-term contributions to people, such as clean water for drinking, irrigation, and industrial use; fishing grounds; grazing land; pollination of crops and natural vegetation; soil formation; clean air; climate regulation; tourism opportunities; flood attenuation and disaster risk reduction (Cadman *et al.*, 2010). Biodiversity fundamentally sustains life and underpins many aspects of human well-being and socio-economic development (Millennium Ecosystem Assessment, 2005). Such biodiversity includes mountain catchments, rivers, wetlands, coastal dunes, tracts and corridors of natural vegetation, and the immense diversity of plants and animals in the Western Cape.

Biodiversity forms the foundation for all ecosystem goods and services, which in turn provides the base upon which the economy and all of society functions. The fact that healthy ecosystems are a critical foundation to human health is explicitly acknowledged in the One Health Theory of Change and Joint Plan of Action¹¹. Reduced ecosystem services impact human health and food production, which is why one of the action tracks in the Joint Plan of Action is to "*protect, restore and prevent ecosystem and environmental degradation*".







South Africa's legislation enshrines environmental protection and wise stewardship via the Constitution of the Republic of South Africa (section 24 of the Bill of Rights) through national legislation – The National Environmental Management Act 107 of 1998 (NEMA), National Environmental Management Biodiversity Act 10 of 2004 (NEM:BA) and National Environmental Management Protected Areas Act 57 of 2003 (NEM:PAA), as well as provincial legislation such as the Western Cape Biodiversity Act 6 of 2021 (WCBA) and the Western Cape Nature Conservation Ordinance 19 of 1974 (The Ordinance). The NEM:BA and WCBA requires reporting on the state of biodiversity at a national level and provincial level, respectively.

¹⁰ Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity (<https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>)

¹¹ Developed by the Food and Agriculture Organisation of the United Nations (UN), the UN Environment Programme, the World Health Organisation and World Organisation for Animal Health (FAO *et al.*, 2022).

CapeNature implements provincial biodiversity monitoring to enable the national process. This also align with the country's international obligations under Articles 6 and 7 of the Convention on Biological Diversity (CBD). Furthermore, the Aichi Biodiversity Targets were replaced by the Kunming-Montreal Global Biodiversity Framework (GBF) monitoring framework and includes the conservation of at least 30% of land and sea by 2030 (the 30x30 target)¹², as well as effective restoration of 30% of areas of degraded land and sea. As of 2023, 17.6% of the Western Cape's total area is formally conserved in Protected Areas. Even taking into account that formal Protected Areas are only one of the categories that count towards the 30x30 target, achieving this target for the Western Cape would require an increased rate of conservation estate expansion than that which is currently achievable based on existing resource allocations.

Table 2 Biodiversity: Outlook Indicators 2024

Indicator	Quantification	Desired state	Trend
Ecosystem threat status	<ul style="list-style-type: none"> Increase in threat status for some vegetation types due to habitat loss (109 CR, 54 EN, 28 VU)¹³ (See Info Box above for description of abbreviations). 	<ul style="list-style-type: none"> Maintain or decrease the threat status for all ecosystems in the Western Cape 	<p>Declining</p> 
Ecosystem protection level	<ul style="list-style-type: none"> Current protected area network amounts to 16.5% of the Western Cape Increase of 426 260.5 ha protected from 1 852 649.5 ha in 2017 to 2 278 910 ha in 2022 	<ul style="list-style-type: none"> Increase the protection category for all ecosystems in the Western Cape Increase the total extent of areas formally protected 	<p>Improving</p> 
Biodiversity priority areas	<ul style="list-style-type: none"> Combined loss of 219 804 ha in CR (13% loss), EN (12% loss) and VU ecosystems (12% loss) between 2013/2014 and 2020 	<ul style="list-style-type: none"> Reduced loss of CBAs Increased number of CBAs secured in new/expanded protected areas 	<p>Declining</p> 
Habitat degradation	<ul style="list-style-type: none"> Highest levels of change occur in areas with the most threatened ecosystems 	<ul style="list-style-type: none"> Reduction in the extent of degraded land Increase in the extent of areas rehabilitated, or restored where possible 	<p>Declining</p> 
Species threat status	<ul style="list-style-type: none"> Between 2016 and 2023, 64 species have been uplisted to more threatened categories of the SA Red List due to real changes in threat levels; 23 of these uplistings have been into EN, CR or CR-PE status. 	<ul style="list-style-type: none"> Reduction in the SA Red List status of species across all categories, particularly within the Critically Endangered and Endangered categories 	<p>Declining</p> 
Invasive alien species	<ul style="list-style-type: none"> Large proportions of areas in CapeNature protected areas with moderate increase in IAP densities between 2018/19 and 2022/23 As of 2019, 344 invasive species were recorded in WC 	<ul style="list-style-type: none"> Reduction in the number, population density and extent of distribution of invasive alien species across all biological groups 	<p>Declining</p> 

¹² Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity (<https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>)

¹³ Based on the recognition of 349 ecosystem types in 2023, compared to 163 ecosystem types recognised in 2018.

WESTERN CAPE STATE OF ENVIRONMENT OUTLOOK REPORT 2024

Indicator	Quantification	Desired state	Trend
	<ul style="list-style-type: none">No update of 2010 National Invasive Alien Plan Survey available yet		

Chapter 5 Oceans & Coast



OCEANS & COAST

OUTLOOK: STABLE

GAINS



Marine Protected Areas have nearly doubled in number within the Western Cape (9 MPAs to 17 MPAs). Management initiatives such as Western Cape Coastal Management Programme, Estuarine Management Plan development and approval, Coastal Management Lines, Coastal Access Strategy have assisted with an improved and co-ordinated response to the pressures.

LOSSES



There is ongoing loss of threatened ecosystems in the Western Cape coastal zone. Pressures from climate change, resource use and resource extraction exacerbate this loss of threatened ecosystems in the coastal zone. Overall, there is a shift towards high use and depletion of key resource species in the Western Cape.

CONCERNS



Marine and estuarine water quality that are compromised due to various pressures on these systems, ultimately affecting Western Cape ecosystem health.

KEY TRENDS

- There are more threatened ecosystem types in the coast (60%) compared to that for the rest of the land and sea (16%). This trend is driven by the fact that pressures within the land largely result in more habitat loss in localized contexts related to a direct pressure (e.g., mining, urban development) whereas estuarine and marine ecosystem types are more affected by several diffuse pressures that cause severe ecological degradation (e.g., flow modification, pollution, trophic cascades from overfishing).
- Habitat degradation is prevalent within the coast and immediate inland areas of the coast, where the rainfall is higher and agricultural capabilities are greatest.



ESTUARY HEALTH

Large predominantly open estuaries on average are in a fair state, while the temporarily open/closed estuaries vary from good to poor condition depending on the level of pressure on them.

There is an increase in extent and adequate management of MPAs. Thirteen estuaries have been identified as priority areas in need of improved conservation and protection.

CONSERVATION AREA



SPECIES EXPLOITATION

The trend generally continues towards higher usage and depletion. Key resource species (commercial) saw a 3% increase in heavily depleted stocks; depleted stocks indicated a 6% decrease.

- Implement key coastal & estuary management plans
- Protect sensitive marine and estuarine ecosystems
- Development of sustainable coastal livelihoods programme

SUSTAINABLE WAY-FORWARD



Outlook: Stable
Key Challenge: Build on current progress that has been made in several institutional responses to shift the stable state to an improving state for the Western Cape oceans and coast.

The 2005 State of Environment Report for the Western Cape (DEADP, 2005) expressed concern that the health of the coastal zone was deteriorating, citing increasing pressure from tourism, economic growth and over exploitation of fish stocks as the primary drivers of this situation. The indicators presented for the 2013 report again pointed towards a similar conclusion, in that the health of the oceans and coasts of the Western Cape remain a concern, perhaps more so in light of new data such as the results of the NBA 2011. Impacts such as coastal erosion are being more acutely felt, evidenced by the increased responses to these issues.

However, significant progress has been made since 2005 in terms of conservation and protected areas, monitoring and reporting, as well as legal and institutional responses to environmental issues in the Western Cape. The development of estuary management plans, set-back lines, new monitoring programmes and the continued expansion of marine protected areas are just a few examples of the ways in which government and the private sector are responding to some of the aforementioned areas of concern.

The importance of correctly managing our coastal areas, as well as the economic opportunities that the coast offers, has been receiving increasing attention and has resulted in a notable increase in Marine Protected Areas within the Western Cape. Although this is securing a current stable outlook for the Western Cape's oceans and coasts, several concerning issues remain. There is a pressing need to increase efforts and resources to address the negative impacts on these dynamic and often sensitive coastal and marine environments. The ongoing high levels of transformation of terrestrial threatened ecosystems in the coastal zone—primarily due to human activity, rising pollution levels, and the rapid decline in fish resources—are particularly alarming.

Despite these challenges, significant progress has been made in several institutional responses. These include the development and approval of Estuarine Management Plans and Mouth Maintenance Management Plans, the determination of Coastal Management Lines, and an increase in the number of Blue Flag beach accreditations achieved by municipalities. Additionally, coastal legislation has been updated with new policies, including the revised National Environmental Management: Protected Areas Act (NEMP), Coastal Access bylaws, and the updated Provincial Coastal Management Programme. The establishment of eight

new marine protected areas and plans to expand protected areas in the coastal zone represent notable advancements in improving the condition of the coastal environment.

Further insights from the forthcoming National Biodiversity Assessment (2024), expected in 2025, will provide additional context for understanding current trends. However, the timing of this report's release does not align with the National Biodiversity Assessment (NBAP) process, and future updates may benefit from better synchronisation to enable more current evaluations.

The trends described for the oceans and coasts of the Western Cape Province highlight many areas of concern with regards to the impact human populations are having on the dynamic and often sensitive coastal and marine environments. Of particular concern is the threat status of large areas of marine ecosystems and the high levels of transformation of terrestrial threatened ecosystems in the coastal belt, mostly as a result of human activity. These impacts are exacerbated by global environmental problems such as climate change, together resulting in a deteriorating state of the marine and coastal environment.





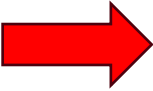

Effective responses to the impacts and pressures on the receiving environment are heavily dependent on the best available data and information. With this in mind, data and information needs with respect to the Western Cape oceans and coasts have been captured in the SoEOR 2024:

- Expanded Monitoring: Enhance the monitoring of coastal water quality across all district municipalities, in line with the latest national water quality guidelines.
- Fish Stock Assessments: Increase stock assessments for both commercial and recreational fish species to enable informed review of quotas for both commercial and recreational fish species followed by the appropriate application of data for improved quota allocation and management.
- Coastal Erosion Tracking: Monitor coastal erosion and the movement of mobile sediment in risk-prone areas of the province.
- Estuarine Water Quality: Expand monitoring of water quality in estuarine areas.



The findings of the Oceans and Coasts chapter can be summarised as an overall stable outlook. Table 4 contains the anticipated changes or outlook for the future of oceans and coasts, based on the findings in this chapter. All of these aspects have been identified in the chapter, and should be referred to in more detail for a complete understanding of the dynamics associated with the ocean and coastal management.

In summary, the Western Cape Oceans and Coasts chapter presents an overall stable outlook.

Table 3 Oceans & Coast: Outlook Indicators 2024

Indicator	Quantification	Target/Desired State	Trend
Coastal water Quality	<ul style="list-style-type: none"> Substantial increase in number of Blue Flag Beaches from 18 in 2013 to 31 in 2017 and now 33 (and 5 pilot sites) in 2023 indicative of good water quality management at high use beaches. 	Coastal water quality meeting relevant standards	Improving 
Estuary health	<ul style="list-style-type: none"> 15% "excellent", 26% "good", 44% "fair" and 15% "poor" condition estuaries in the Western Cape. An overall improvement in estuary health but a 4% increase in estuaries in the "poor" category (NBA, 2018). EMP development has substantially improved. 	<p>No nonfunctional Estuaries</p> <p>No decline in estuary health</p>	Improving overall (but more estuaries in the poor category) 
Conservation areas	<ul style="list-style-type: none"> 9 Marine Protected Areas (MPAs) in 2017 with an increase to 17 MPAs within the Western Cape in 2018. Increased recognition of management functions 	Increase in extent and adequate management of MPAs.	Improving 
Exploitation of fish species	<ul style="list-style-type: none"> Commercial: key resource species that have been heavily depleted has increased by 3%, species that are depleted have increased by 6% between 2014 and 2023. Optimal exploited species increased by 5% whilst abundant species decreased by 6%. Overall, there is a shift towards high use and depletion of stocks. Recreational: 3% increase in heavily depleted species; 10.8% increase in depleted species, Optimal species increase of 8.5%, decrease of 10% in abundant species between 2014 and 2023. 	All species are optimally exploited	Declining 
Marine ecosystems threat status	<ul style="list-style-type: none"> The NBA Marine Realm Technical Report indicated that the results over 2011, 2014 and 2018 are broadly similar. Estuary ecosystem threat status was recently assessed and there is no previous data for trend analysis. 35% of estuary ecosystems are classified as endangered and 18% as critically endangered. 	No increase in threat status	No change, high concern  

WESTERN CAPE STATE OF ENVIRONMENT OUTLOOK REPORT 2024

<p>Transformation</p>	<ul style="list-style-type: none"> Loss of 13% habitat in critically endangered ecosystems, 12% in endangered ecosystems and 12% in vulnerable ecosystems (majority in the coastal area) between 2013/14 and 2020. 	<p>No loss of threatened ecosystems in the coastal belt</p>	<p>Declining</p> 
<p>Number of buildings in high-risk coastal areas</p>	<ul style="list-style-type: none"> 40% increase in the total number of buildings in high-risk coastal areas in the province between 2006 and 2013. DFFE data analysis in 2020 indicates significant increase in buildings, however the analysis was undertaken using a different methodology. 	<p>No increase in number of buildings in high-risk coastal zones</p>	<p>Trend analysis not possible as recent datasets not comparable</p> 

Chapter 6 Inland Water



INLAND WATER

OUTLOOK: DECLINING

GAINS



The Western Cape planning has improved specifically for planning on water availability, as key lessons have been learnt from the provincial drought event. This strategic planning and management together with good rainfall since 2019 – above average rainfall in 2023 – has not necessitated any major water use restrictions to be put in place in the recent years.

LOSSES



The Western Cape faces a persistent water resource deficit, coupled with the need to allocate water for ecological reserves, which act as a buffer for social and economic resilience. The region's water infrastructure is deteriorating, raising concerns about its long-term sustainability and functionality.

CONCERNS



The Western Cape Water Supply System (WCWSS) is presently over-allocated. Consequently, the Western Cape economy faces water constraints, even when the region's dams are full. The inadequate access to water and the lack of reliable supply assurances have a detrimental impact on economic growth.

KEY TRENDS

- The inadequate access to water and the lack of reliable supply assurances have a detrimental impact on economic growth.
- Management of the Western Cape water systems has improved; however the high demand for water consumption and various long-term water quality issues have worsened in the recent years.
- In densely populated regions of the Western Cape, river sites show poor conditions due to inadequate management of sewage treatment works and exceeded carrying capacities with a cumulative impact on freshwater ecosystems.



WATER AVAILABILITY

The Western Cape Water Supply System (WCWSS) is over-allocated, causing water constraints for the economy despite good rainfall. Agricultural water is fully allocated, necessitating the development of alternative sources and improved efficiency. Additionally, dam yields are impacted by invasive alien plants.

Urban water stream quality is a concern, and key priorities include tackling microbial contamination and rehabilitating inland ecosystems. Outside Western Cape urban areas, river conditions are stable based on habitat assessments.

FRESHWATER ECOSYSTEM HEALTH



FITNESS FOR USE

Eighteen water systems in the Western Cape are now in a critical state, up from nine in 2013. The provincial Risk Ratio for treatment plants has slightly increased from 52.7% in 2013 to 53.1% in 2021.

- For sustainable groundwater resource development, it is crucial to address management challenges identified in regional studies alongside development efforts.
- Loss of ecosystem and ecosystem services must be avoided.

SUSTAINABLE WAY-FORWARD



Outlook: Declining
Key Challenge: Build on current progress that has been made in several institutional responses to shift the stable state to an improving state for the Western Cape oceans and coast.

The Western Cape is grappling with a series of challenges that are contributing to the decline of its water resources. The region is facing multiple issues, including the degradation of its water infrastructure. Vandalism and theft have become significant threats due to inadequate security funding, jeopardising the functionality of essential water systems and further degrading ecosystems. Additionally, the likelihood of extreme weather events has increased due to climate change, with a three to fourfold rise in the probability of experiencing events with a 1:200 to 1:400-year recurrence. The management of catchments and river maintenance is insufficient, exacerbating these risks, especially for infrastructure crucial to transportation and tourism, which is more vulnerable during flooding events. Addressing these issues requires urgent, comprehensive measures to enhance the resilience of the region's water infrastructure and counteract the declining trend in water resources. A whole-of-society approach and effective collective management are essential, particularly in rapidly growing urban areas.

The poor state of inland water has several impacts, including increased costs for water treatment, loss of biodiversity, and diminished ecosystem services in altered rivers. Economically, the region faces potential damage to infrastructure from floods, reduced crop yields, and job losses if water availability becomes severely restricted. Human health is also at risk due to microbial contamination in water, underscoring the critical importance of reliable water provision to prevent major health and economic consequences.

The Western Cape faces a critical water resource deficit, further complicated by the need to allocate water for ecological reserves, which serve as a buffer for social and economic resilience. The ongoing deterioration of water infrastructure raises concerns about its long-term sustainability and functionality. Load shedding presents another significant risk, particularly concerning water quality, as intermittent power supply disrupts essential treatment processes. Additionally, there is a noticeable shortage of skilled technicians, hindering effective maintenance and management of water infrastructure. Addressing these challenges requires a comprehensive approach, including strategic planning, investment in infrastructure upgrades, and initiatives to enhance technical expertise and capacity within the water management sector.

The Western Cape Water Supply System (WCWSS) is currently over-allocated due to a decrease in system yield. This situation means that even when dams are full, the region faces

water constraints that hinder economic growth. Projections suggest that economic benefits will be realised once these constraints are partially alleviated.

Planning for water availability in the Western Cape has improved, drawing lessons from past drought events. The province has made significant progress in water management, supply planning, and augmentation strategies, positioning itself to better handle future droughts. This proactive approach, combined with favourable rainfall patterns since 2019—including above-average rainfall in 2023 and 2024—has allowed the Western Cape to avoid major water use restrictions in recent years. Nonetheless, with climate change increasing the likelihood of drought and extreme weather events, it is imperative to develop and implement strategies to mitigate these impacts. This includes better land use management and safeguarding water resources, which are currently underway. Recommendations from the Department of Water and Sanitation (DWS) emphasise the need for monitoring and enforcing compliance with Reserve and Resource Quality Objectives, as well as efforts to rehabilitate degraded water resources.




At the local government level, various projects and planning efforts have been implemented to augment water supply. The partnerships between Western Cape water users remain stable. However, rapid population growth, high water demand, and long-standing water quality issues continue to present challenges. While progress has been made, it is important to recognise that improvements in water quantity do not necessarily translate into better water quality. Data from the outdated State of Rivers Report (2018) indicate that only just over 10% of rivers and wetlands have "ideal" water quality, with many areas in densely populated regions showing poor conditions due to inadequate sewage treatment and excessive carrying capacities.

Wetlands across the Western Cape are under significant pressure from agricultural practices and high groundwater abstraction, particularly in regions like the Sandveld. The spread of Invasive Alien Plants (IAPs) is also impacting dam yields, with Theewaterskloof and Voëlvele dams experiencing significant reductions.

Looking ahead, the Western Cape Water Supply System (WCWSS) is expected to see a substantial increase in groundwater use. To ensure the sustainability of this increased groundwater use, it is crucial to address the associated challenges identified through comprehensive groundwater management and planning studies, such as the Berg WAAS and the Berg Water Resources Classification Study. Addressing these management challenges alongside development initiatives is essential for the long-term sustainability of groundwater utilisation. For example, the City of Cape Town's New Water Programme highlights the need for monitoring water demand and adjusting the Adaptable Programme accordingly. Water reuse and desalination are recognised as pivotal for securing long-term water availability, but

they require thorough feasibility and planning studies to ensure readiness for future water demand projections. These ongoing efforts aim to transition the Western Cape's water state from a declining trend to a stable or improving condition.

Table 4 Inland Water: Outlook Indicators 2024

Indicator	Quantification	Target/desired State	Trend
Water availability	<ul style="list-style-type: none"> The WCWSS is currently over-allocated. The Western Cape economy faces water constraints, regardless of good rainfall seasons. All agricultural water has been fully allocated in the Western Cape – effort must be placed to develop alternative sources and to improve agricultural efficiency. The yields of a number of dams within the WCWSS remain affected by the existing spread of IAPs. <p>Positive factors that can be emphasised:</p> <ul style="list-style-type: none"> The majority of the Western Cape province is not currently experiencing any droughts. There has been a significant renewed effort towards expanding water supply capacity in the Western Cape. 	<p>No yield exceedances</p> <p>Adequate water supply for all towns</p>	<p>Decline</p> 
Fitness for use	<ul style="list-style-type: none"> 18 water systems within the Western Cape are currently in a critical state; an increase from 9 systems in 2013. The provincial Risk Ratio for treatment plants has remained relatively stable, changing only slightly from 52.7% in 2013 to 53.1% in 2021. 	<p>No intolerable water quality</p> <p>Zero stations with extremely high levels of microbial contamination</p> <p>Ecological functioning</p>	<p>Decline</p> 
Freshwater ecosystem health	<p>Ecological state of rivers (Present Ecological State - PES):</p> <ul style="list-style-type: none"> 50% unmodified, natural, largely natural 17% moderately modified 20% largely or seriously modified <p>Strategic Water Source Areas (SWSA):</p> <ul style="list-style-type: none"> Despite the importance of SWSAs, the majority are only partially protected. <p>The quality of water streams in urban areas is the concern; if this water quality matter is not dealt with the expectation is for this to decline in state for near future. The current stable state is upheld by water authorisations and reviews such as freshwater ecosystems which are consistently considered with new developments and planning. Resource quality objectives are guiding this and act as a clear guideline for development. Other than Western Cape urban areas, there is no critical decline in the state of rivers based on parameters from habitat assessments etc. which are not indicating a steep decline.</p>	<p>No streams seriously or critically modified</p>	<p>Stable</p> 

Chapter 7 Air Quality



AIR QUALITY

OUTLOOK: CONCERN

GAINS



Gains are found in the adoption and the implementation of the third (3rd) generation Western Cape Air Quality Management Plan (AQMP). All 30 Western Cape Municipalities have designated an Air Quality Officer have adopted their respective AQMPs, which have been integrated as sector plans within their broader Integrated Development Plans (IDPs).

LOSSES



From 2018-2022, the Western Cape faced a major lack of resources insofar as monitoring of air quality, coupled with the challenges of aging monitoring infrastructure. This has resulted in limited air quality monitoring in the province and requires investment and resources to enhance monitoring and infrastructure recapitalisation.

CONCERNS



Concern lies in the inadequate investment in the Western Cape Air Quality Monitoring Network, with several air quality monitoring stations currently not actively monitoring, resulting in data gaps, which does not allow detailed air quality monitoring in the province. This hampers efforts to manage air quality effectively in the Western Cape.

KEY TRENDS

- Overall, the air quality monitoring trends indicate that air quality is stable, but declining in the Province, particularly in the City of Cape Town Metropolitan.
- Utilising Particulate Matter with an aerodynamic diameter of less than 10 μm (PM10) as proxy indicator to estimate economic impact of air pollution on human health in the Western Cape, it is suggested that air pollution is likely one of the largest threats not only to human health, but also to the economy of the Western Cape.



Particulate Matter (PM)

Exceedances of the annual average PM₁₀ NAAQS of 40 $\mu\text{g}/\text{m}^3$ were observed at Khayelitsha and Wallacedene monitoring stations. It is attributed to local sources such as wind-blown dust and wood burning for cooking and heating. This is a concern as PM₁₀ is used as a proxy to understand an areas' level of pollution exposure in correlation with potential health issues.

All Western Cape monitoring stations are recording annual average SO₂ concentrations below the annual SO₂ NAAQS of 50 $\mu\text{g}/\text{m}^3$, however, the pollutant trends have increased over time.

SULPHUR DIOXIDE



OXIDES OF NITROGEN

All annual averages of NO₂ concentrations, as depicted for each monitoring station in the Western Cape, were below the annual NO₂ NAAQS of 40 $\mu\text{g}/\text{m}^3$. The pollutant trends have increased over time.

- Revolutionise the provincial transportation system to reduce vehicle emissions
- Follow innovative and sustainable urban development
- Prioritise and improve spatial and temporal resolution of the Air Quality Monitoring network for the Western Cape, to manage air quality effectively in the Province.

SUSTAINABLE WAY-FORWARD



Outlook: Concern
Key Challenge: expanding and upgrading the air quality monitoring network for better data, strengthening enforcement of environmental regulations, and overcoming barriers to green urban development.

Air pollutants have the ability to spread across extensive areas, affecting national, provincial, and local regions. By mitigating air pollution, it is possible to reduce both immediate and long-term health effects, such as respiratory illnesses, and to alleviate the negative impacts associated with climate change. Primary sources of air pollution differ by region but generally include industrial activities, mobile sources like vehicles, domestic fuel use (such as wood for cooking and heating), veld fires, and other activities.

In the Western Cape, significant contributors to air pollution include vehicle emissions, economic activities (including industries and mining), veld fires, and residential energy use. According to the 2023 INRIX Global Traffic Scorecard and the TomTom Traffic Index, commuters in Cape Town spend between 83 to 127 hours in traffic annually, with 48 of those hours being in congestion. This situation ranks Cape Town as the 2nd worst in Africa and the 9th worst in the world for traffic congestion. Consequently, Cape Town commuters face an additional R882 in fuel costs each year. To address this, Cape Town is investing R444 million over the next three years to improve traffic flow through road projects and enhancements to public transport services. However, the absence of roadside ambient air quality monitoring stations complicates efforts to accurately measure pollution levels within the Western Cape. This monitoring gap undermines the effectiveness of policies and interventions designed to improve air quality and reduce health risks associated with traffic-related pollutants.

Trends in Particulate Matter with an aerodynamic diameter of less than 10 μm (PM₁₀), Nitrogen Dioxide (NO₂), and Sulphur Dioxide (SO₂) indicate that air quality in the province is stable but with concerning that air quality will worsen towards a declining state, despite monitoring data generally show concentrations below National Ambient Air Quality Standards (NAAQS). PM10 exceedances have been notably observed in low-income settlements such as Khayelitsha and Wallacedene, likely due to open fires used for cooking and heating. These areas contribute to over half of the daily NAAQS exceedances of PM10 in the region. The increasing frequency of exceedances in low-income areas, compared to high-income areas, signifies that residents in these lower-income neighbourhoods are exposed to higher levels of harmful air pollution.

Effective air quality management requires active engagement and collaboration among various levels of government. An integrated approach can enhance coordinated planning

and the development of effective systems. For example, well-designed spatial planning can lead to more efficient transportation, thereby improving overall air quality.

Monitoring air quality is crucial, but budget constraints across the province significantly hinder this effort. The Department of Environmental Affairs and Development Planning (DEA&DP) has experienced a substantial reduction in its budget, impacting the maintenance and recapitalisation of its monitoring network. This situation has been exacerbated by increased loadshedding, which places additional strain on both old and new equipment, resulting in frequent maintenance and repairs. Consequently, air quality monitoring officials have been forced to conduct in-house maintenance and troubleshooting, leading to the temporary decommissioning of two monitoring stations. This decision aims to focus resources on stations that measure and report criteria pollutants to the South African Air Quality Information System (SAAQIS) in real time. To address these challenges, additional budget is needed to fill vacant posts in air quality monitoring, replace aging analyzers, and install a backup power supply system to mitigate the impact of loadshedding. Moreover, increased human resource capacity is essential for enhanced compliance monitoring and enforcement of air quality regulations in the province.

A Human Health Risk Assessment Study conducted by the Western Cape Government from 2013 to 2016 estimated the economic impact of air pollution on human health in the province to be R8.7 billion annually (DEA&DP, 2016). This underscores that air pollution represents a significant threat not only to public health but also to the province's economy.

The current outlook for air quality in the Western Cape is a concern as air quality in the province is stable. To avoid a declining state, action must be taken. As captured in the Air Quality chapter of the Western Cape State of Environment Outlook Report, improving air quality in the Western Cape requires a multi-pronged approach. Key strategies include expanding and upgrading the air quality monitoring network for better data, strengthening enforcement of environmental regulations, and overcoming barriers to green urban development. Revolutionising transportation through investments in public transit and low-emission vehicles is essential, as is fostering collaboration between government and sectors for innovative solutions. Additionally, addressing indoor air pollution, especially through clean cook stove campaigns, is crucial for protecting vulnerable populations. These measures collectively aim to reduce pollution and promote a healthier, more sustainable environment.

Chapter 8 Energy



ENERGY

OUTLOOK: CONCERN

GAINS



The Western Cape is making rapid progress in its energy landscape by prioritising renewable projects, especially solar and wind power, under the REIPPPP and foreign direct investment in renewable energy, with substantial growth potential.

LOSSES



In 2022, Eskom supplied 16.9% less electricity to the Western Cape compared to 2013, equating to a reduction of 3,920 gigawatt-hours (GWh). This decline is influenced by factors including loadshedding, energy efficiency, increased non-grid renewable energy, and the Western Cape's energy resilience programs.

CONCERNS



A major concern for the Western Cape is the development and maintenance of transmission and distribution networks to handle the growing demand and facilitate the integration of renewable energy projects – electricity infrastructure that is not under provincial management.

KEY TRENDS

- In response to nearly two decades of load shedding affecting energy security, the Western Cape's Energy Resilience Programme (ERP) is diversifying the energy mix and sustain economic growth by promoting Small-Scale Embedded Generation (SSEG) and rooftop solar PV installations, reducing reliance on Eskom.
- Non-grid based renewable energy, i.e. rooftop PV, is trending for the province mostly because large scale renewable energy equates to Eskom supply.
- Through its Energy Resilience Programme, the Western Cape is reducing its reliance on Eskom, resulting in fewer stages of loadshedding compared to other provinces in the country.



ENERGY SUPPLY

The Western Cape's energy supply is improving due developments including two gas turbines (207 MW), eight wind farms, seven solar power plants and small-scale embedded generation (SSEG) is being implemented across 24 municipalities.

Overall consumption trend is fluctuating as shown by the Western Cape emissions profile (GHG inventory reporting). The City of Cape Town and West Coast energy consumption combined stands at 86% of total energy use, with the CCT dominating at 56% consumption (2018).

ENERGY USE



ENERGY INTENSITY

The West Coast has higher industrial intensity compared to other districts, while Cape Town's relatively low intensity is due to its focus on the service industry. Data remains limited however there is indication of a decrease in intensity per unit of GDP.



ENERGY SECURITY

Loadshedding significantly worsened during the review period, with 2023 experiencing the highest levels of load shedding hours and the lowest total energy availability.

- Ensure the availability of affordable, reliable, sustainable energy supply
- Creating an enabling environment for the transition from fossil fuel to renewable sources of energy

SUSTAINABLE WAY-FORWARD



Outlook: Concern
Key Challenge: Ensuring an affordable and reliable electricity supply, creating a supportive environment for transitioning from fossil fuels to renewable energy, and leveraging the energy transition as a competitive advantage for the province's economy.

For many years, South Africa's energy landscape has been characterised by both significant advancements and ongoing and critical challenges. The country is actively expanding its renewable energy capacity, with a strong focus on solar and wind power to diversify its energy mix and reduce dependence on coal. The Integrated Resource Plan (IRP) 2019 outlines ambitious goals for increasing renewable energy deployment, supported by ongoing projects under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). At the same time, Eskom, the state-owned electricity utility, is undergoing reforms aimed at improving its financial sustainability and operational efficiency, which are crucial for enhancing energy reliability amidst persistent power supply issues. The transition to renewable energy involves complex trade-offs between ensuring energy security and achieving climate change mitigation goals, leading to discussions about integrating renewables into the grid and the roles of gas and nuclear energy. Technological advancements in energy storage and digital solutions are also influencing the sector's development. In the South African context with equal reference to the Western Cape, the fact that no wealthy country has low energy intensity suggests that aiming for higher energy intensity (i.e. rapid economic growth) needs to be considered from a sustainability approach – and that the question rather should be what type of energy mix are being produced or consumed.



Electricity shortages currently represent the primary constraint on economic growth and job creation in South Africa, due to a substantial six (6) Gigawatt (GW) shortfall in production capacity. Additionally, the country is among the most carbon-intensive economies globally, which has serious implications for climate change, environmental sustainability, and overall economic stability.

In the Western Cape, significant progress is being made in renewable energy, with ongoing developments in solar and wind projects benefiting from the region's favourable climate. The Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) has facilitated the establishment of several solar and wind farms, boosting the region's renewable energy capacity. The province has become the leading recipient of foreign direct investment (FDI) in renewable energy projects. Despite this growth potential and the ability to create up to 1.2 million jobs, renewable energy currently constitutes only a small

fraction of South Africa's total energy production. Despite the strong push towards renewable energy, the Western Cape needs to diversify its energy sources to stabilise the energy landscape, reduce reliance on specific sources, and enhance overall energy security. While the growing renewable energy pipeline supports future sustainability, bulk transmission remains a major challenge for delivering this energy to the market. One of the main challenges is integrating the increasing share of renewable energy sources, such as solar and wind power, into the existing grid infrastructure and ensuring the capacity of transmission networks, which are already constrained. Managing the intermittency of renewable energy generation and maintaining grid stability are critical issues that must be addressed to ensure a reliable electricity supply for the Western Cape. Efforts are underway to strengthen grid infrastructure to support the growing share of renewables and address integration challenges. Local government initiatives, such as energy solutions specific to the Western Cape through for the Green Cape support programmes such as the 'Green Economy Ecosystem Support' programme, aim to promote sustainable energy practices and support local renewable energy projects. Despite ongoing regulatory complexities and grid stability issues, these challenges are being prioritised to foster a sustainable and resilient energy sector.

To shift the energy outlook of the Western Cape from a state of concern to a stable or improving one, ongoing infrastructure development and maintenance are critical. Investment is needed to upgrade and maintain the electricity infrastructure, including improving transmission and distribution networks to accommodate growing demand and integrate renewable energy projects. However, challenges persist, as the province does not own the electricity infrastructure, and some municipalities are responsible for distribution. Eskom remains responsible for these issues, and continued engagement on these challenges is essential. The Western Cape's priorities to address the energy crisis and mitigate the impacts of energy constraints are outlined in the Growth4Jobs Strategy (2023), which includes ensuring an affordable and reliable electricity supply, creating a supportive environment for transitioning from fossil fuels to renewable energy, and leveraging the energy transition as a competitive advantage for the province's economy. Ensuring a reliable energy supply, especially during peak demand periods and adverse weather conditions, remains a challenge, but the Western Cape is focused on enhancing its resilience against power outages and reducing dependence on national electricity to improve energy security.


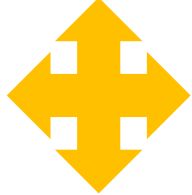

Table 5: Energy Outlook Indicators 2024

Indicator	Quantification	Desired State/target	Trend
Energy supply	<ul style="list-style-type: none"> • PetroSA gas-to-liquid plant ¹⁴ (no contribution since 2020- feedstock depletion) • Gas turbines: 2x utility scale, and a couple of smaller ones in Cape Town (Roggebaai and Acacia) • Koeberg nuclear reactor (1 800 MW) • Palmiet pumped storage (580 MW) • 8 wind farms • 7 solar power plants¹⁵ • ESKOM Solar PV Battery Energy Storage Systems (148.5MW of total BESS capacity to be installed) for provincial capacity • Implementation of SSEG in 24 municipalities 	<ul style="list-style-type: none"> • Increased energy generation from renewable sources • Decreased dependence on coal 	<p>Improving</p> 
Energy use	<ul style="list-style-type: none"> • Total excluding marine 292 342 004 GJ in 2009 276 333 250 GJ in 2013 299 401 472 GJ in 2016 272 579 266 GJ in 2018¹⁶ • 52% used by transport in 2017/18, 2% down from 2015/16 (previously 35% in 2004 and 52% in 2009) • Mostly coal based electricity and liquid fuels • CCT consumes 56%, West Coast 26%, Garden Route 10%, Cape Winelands 7%, Overberg 2% and Central Karoo 1% 	<ul style="list-style-type: none"> • Decrease in coal-based energy use • Decreased reliance on coal-based electricity and liquid fuels • Sustainability performance may rather address what kind of energy consumed, increased energy use is positively associated with employment and development, but negatively associated with the natural environment, therefore a sustainability layered approach (type of consumption) could be considered. 	<p>Stable</p> 

¹⁴ Suspended in 2020, not operational yet but securing gas supply deals. Must it be kept or removed, they haven't supplied energy in the last 3 years

¹⁵ includes operational wind and solar PV installations awarded from REIPPP bid window 1 to 4, plus 5 projects under construction, all in the western cape!

¹⁶ Note: there is a two year lag GHG inventory reporting – latest data provided here

<p>Energy intensity</p>	<ul style="list-style-type: none"> • 41 GJ/capita energy consumption in 2018 decrease from 48 GJ/capita in 2016. • Emissions per capita decreased (for various factors explained in the chapter). • 5t CO²e/capita in 2018, decrease from 6t CO²e/capita recorded in 2016 • Decrease in intensity per unit of GDP since between 2016 and 2018 • West Coast higher intensity than other districts (industries) • CCT relatively low intensity due to service industry. 	<ul style="list-style-type: none"> • Decrease in GJ/capita energy consumption • Decrease in tonnes of CO²e /capita • Decrease in energy intensity per GDP 	<p>Declining</p> 
<p>Domestic energy use</p>	<ul style="list-style-type: none"> • Approx 600 000 additional households have been connected to the grid for lighting, increasing access from 93% in 2011 to 96% in 2022. • Although the proportion of serviced households was static over the review period, it is estimated an additional 315 000 households have gained access since 2015 in the Western Cape. • Due to rapid installation of solar PV to households, there is currently a decreasing outlook on the percentage of households utilising Eskom generated electricity – yet this is not enough to turn around the overall domestic energy use. 	<ul style="list-style-type: none"> • 100% of households electrified • Increase in number of households using solar PV instead of grid-based electricity • Decrease in households using biomass and other alternative sources of energy 	<p>No Change</p> 
<p>Energy Security</p>	<ul style="list-style-type: none"> • The proportion of households connected to the Eskom grid, for lighting, has remained static since 2016 at approximately 96%. • Loadshedding worsened over the review period with 2023 being by far the worst year in terms of load shedding hours and total energy availability. 	<ul style="list-style-type: none"> • Fewer interruptions in electricity supply due to load shedding • Decrease in duration of interruptions to electricity supply • Decreased reliance on Eskom for electricity 	<p>Declining</p> 

Chapter 9 Human Settlements & Infrastructure



HUMAN SETTLEMENTS & INFRASTRUCTURE

OUTLOOK: STABLE

GAINS



There is an improvement in access to basic services – access to piped water, access to flush toilets, grid access to lighting and weekly refuse removal. There has also been an improvement in the quality of housing construction but despite the use of better building materials, many dwellings remain informal.

LOSSES



Significant losses for provincial human settlements and infrastructure include electricity supply failures and passenger rail services failures. There is also a notable decline in subsidised housing deliveries. Due to national fiscal constraints, capital grants for subsidised housing have been substantially cut compared to the previous period, leading to a roughly 40% annual reduction in the number of new subsidised units.

CONCERNS



Water losses and infrastructure condition are highlighted as concerns. Actual water losses have increased dramatically in the review period and are currently at historic highs and is the result of deteriorating infrastructure the condition of which are resulting in leaks and water losses.

KEY TRENDS

- The Western Cape is experiencing **a significant rate of population growth** across the province, which places significant pressure on the state to provide adequate services that caters for new growth, whilst prior service delivery backlogs remain not fully addressed in the province.
- There has been a significant shift towards **higher density housing typologies** in the Western Cape, which is a positive trends towards improving urban form, and crucial for improving the sustainability of urban settlements and infrastructure services in the province.



HOUSING ADEQUACY

The number of households residing in overcrowded conditions has declined by 13% in the review period; the proportion of households living in adequate dwellings (defined as formal or built with from brick/concrete and not overcrowded) has markedly increased.

Direct household access to piped water has improved from 88% to 93% of households; however, with population expansion the number of households with no access to piped water (direct or communal) has remained static at 20,000 households.

ACCESS TO WATER



SANITATION & WASTEWATER

The proportion of households without adequate sanitation has declined marginally although similar to housing adequacy, the absolute number of households without adequate sanitation increased slightly. The main constraint is wastewater treatment capacity.

- Infrastructure maintenance and expansion is critical to sustainable communities of the Western Cape.
- Open space provision is an important feature of sustainable human settlements, particularly towards lessening 'urban heat islands'.
- Reducing system losses of water.

SUSTAINABLE WAY-FORWARD



Outlook: Stable

Key Challenge: As the province is experiencing the highest population growth rate in South Africa, the key challenge for the Western Cape is addressing remaining backlog ahead of the population influx whilst meeting demands for new infrastructure and housing with appropriate consideration for spatial integration as an integral part of responding to this challenge.

As the province experiencing the highest population growth rate in the country, the Western Cape is facing significant demands for new infrastructure and housing. This growth results in increased consumption of resources and higher levels of waste generation, thereby putting more pressure on natural resources. Nevertheless, despite these challenges, Census 2022, if interpreted directly, indicates that the Western Cape has made notable improvements in access to basic services overall, with substantial societal and environmental benefits. However, there have been some areas of decline during the review period, most notably in electricity supply and the deterioration of passenger rail services. These issues are part of broader systemic national problems caused by the underperformance of national parastatal entities. Additionally, water losses and the condition of infrastructure have also raised concerns in the Western Cape and have worsened over the review period.

Formal housing delivery has not kept pace with household growth, resulting in a growing number of households living in non-formalised dwellings and unplanned settlements. Nevertheless, results from Census 2022 suggest that the quality and materials used in these dwellings have significantly improved. The delivery of public subsidised housing has declined on average by approximately 40% per annum when comparing this review period to the previous. This is due to reduced real budgets because of national fiscal constraints and the varied impacts of Covid-19, including lockdowns and rising building costs. In response, there has been some shift in policy and resources away from providing complete housing structures towards the provision of basic services and serviced sites. This shift may appear as a decrease in formal housing delivery in future but could also lead to improved access to services for those in informal dwellings.

The national fiscal outlook is challenging, with projected economic growth unlikely to keep pace with population growth in the medium term, resulting in a continued decline in economic activity per capita. This situation places greater pressure on the state to provide social and infrastructure services while simultaneously reducing the budget. As a result, funding for new capital infrastructure projects, as well as for the renewal and maintenance of existing assets, is unlikely to improve, posing a significant risk to the medium-term outlook for human settlements and infrastructure systems.

During the review period, the Western Cape emerged from a one in four hundred years drought that had pushed water resources to their limits. This drought highlighted the risks posed by increasingly severe weather and climate-related events in the province. Consequently, there has been a renewed focus on securing additional and diversified water supply sources to enhance the province's resilience. Although the drought led to improved water efficiency across the province, increasing demand and losses mean that continued efforts are needed to maintain these gains.



Significant progress has also been made in the solid waste sector, with the Western Cape Government implementing a 50% ban on organic waste being sent to landfills. This measure addresses the critical challenge of inadequate landfill capacity and unsustainable consumption patterns.




There has been a notable shift in newly completed housing towards higher density typologies in the Western Cape, which is a positive development for improving urban form. This shift is crucial for enhancing the sustainability of urban settlements and infrastructure services in the province.




An analysis of Census 2022, coupled with statistics on new formal housing delivery and the expansion of informal settlements in the Western Cape, indicates that a large proportion of households residing in unformalised dwellings, located in unplanned settlements, have invested their own resources into greatly improving the materials and building quality of their dwellings. This has resulted in a significant reduction in the proportion of households reporting as residing in a shack structure since the previous census.




In summary, while the Western Cape faces considerable challenges, particularly regarding resource pressures, declining infrastructure, and economic limitations, it also shows commendable progress. Improved access to basic services, advancements in housing quality, and increased sustainability efforts in areas like water and waste offer optimism. Moving forward, addressing funding constraints, adapting to climate change, and embracing innovative solutions will be essential to ensuring that the province's human settlements and infrastructure remain resilient and equitable for future generations.

Table 6: Human Settlements & Infrastructure Outlook Indicators 2024

Sector	Indicator	Performance	Outlook	Performance Trend
Housing	Housing adequacy	<p>Number of households residing in overcrowded conditions has declined by 13% since 2016 (Census 2022).</p> <p>The number of adequate dwellings – defined as formal or built from brick/concrete and not overcrowded – has increased proportionally from 74% - 82% of households since 2016.</p> <p>The number of households residing in unformalised dwellings located in unplanned settlements has continued to increase.</p>	<p>The budget for public sector housing delivery appears to be continuing to decline in real terms and the cost of delivery increasing above inflation. Therefore, the rate of delivery of new subsidised houses is not expected to increase significantly in the medium term.</p> <p>Formal completions by the private sector may improve as the interest rates enter a declining cycle.</p> <p>The already high and increasing rate of population and household growth in the province poses significant challenges to meet housing needs and address the backlog.</p>	<p>Improving however rate of formal housing delivery has declined</p> 
	Informal housing	<p>Census 2022 reports a significant decrease in the proportion of households residing in informal, shack, dwellings from 17% in 2016 to 11% in 2022.</p> <p>While the quality of dwellings appears to be improving – formal delivery statistics for private and public sector have declined during the review period, strongly inferring that these dwellings are still informal despite the use of improved building materials.</p>	<p>Given the decline in fiscal resources and policy shifts there will likely be a greater role for private contributions in improving housing adequacy – as suggested by trends revealed in Census 2022.</p> <p>In addition to understand provincial state and outlook, trends on backyard dwellings needs to be assessed.</p> <p>Formal households in predominantly township areas have increased the provision of short-term rentals through offering backyard dwellings, which could contribute to</p>	<p>Stable, with improving quality of materials used in housing construction, however the number of households residing in unformalised dwellings located in unplanned settlements continues to grow.</p> 

Sector	Indicator	Performance	Outlook	Performance Trend
			improved housing from on informal infrastructure	
Access and quality of basic services	Water access	Direct piped water access has increased from 89% to 93% of households between 2016 – 2022 however despite this the number of households with no access to piped water (direct or communal) has remained static at 20 000 households.	The Western Cape is naturally a water-scarce region, and climate change is expected to increase the frequency and severity of droughts. Currently dam levels are sufficient however surety of supply is still not sufficient. It is imperative that new and diverse sources of water supply are realised, as is currently under development.	Improving 
	Water system	Per capita consumption has increased during the review period since the lows of the 2018 drought however they still remain well below historic averages and the lowest consumption per capita in the country despite relatively high access rates. Real losses have increased dramatically over the review period and are at historic highs due to deteriorating infrastructure condition and resulting leaks (Department of Water and Sanitation, 2023b)	While the current outlook is better than in recent years, WDM and managing system losses remain crucial. Both of these aspects have regressed during the review period and the challenge over the next four years will be reigning these in.	Declining 
	Water quality	The province has improved in the number of water systems that scored above 50% in their blue score rating. This shows that Water Services Authorities in municipalities are serious about		Improving 

Sector	Indicator	Performance	Outlook	Performance Trend
		improving their supply systems.		
	Sanitation access	The proportion of households relying on inadequate sanitation declined marginally from 5.3% - 4.8% since 2016 however the total number of inadequately served increased slightly in absolute terms.	Waste water treatment capacity is a key constraint to improving flush toilet access. Major projects in this regard are positive for access expansion.	Unchanged 
	Wastewater treatment	While the province remains the top performer in terms of its green drop score, there was a slight drop in scores from 84.5% in 2013 to 84% in 2021. The municipalities that improved in their green drop score did so by bringing on board a qualified technical team, management's financial and technical support to the staff, and the refurbishments and amendments to their Wastewater Treatment Plants.	The changing climate and the impact thereof have heightened pressure on the finite availability of resources, and the urgent need for preventative measures to be put into place, such as water consumption restrictions.	Unchanged 
	Refuse Removal	The percentage of households with access to weekly refuse removal has overall improved from the 2016 figures to 2022 figures, with four districts showing an overall improvement in access.	There is a need for the province to monitor its growth and ensure that sustainable waste practices and policies are adopted. Local municipalities need to plan for sustainable waste disposal sites and ramp up their recycling efforts.	Improving 
	Electricity access and supply	The proportion of households connected to the grid, for	A large proportion of households that have not been connected are is	Declining overall, with stagnant access and declining

Sector	Indicator	Performance	Outlook	Performance Trend
		<p>lighting, has remained static since 2016 at approximately 96%.</p> <p>Loadshedding worsened over the review period with 2023 being by far the worst years in terms of load shedding hours and total energy availability.</p>	<p>located in unserviceable informal settlements so alternative energy solutions may be needed. There is growing momentum in this regard which could mean a more positive outlook.</p> <p>The significant renewable energy pipeline is positive for future sustainability of electricity but bulk transmission remains a key challenge of bringing it to market.</p>	<p>electricity supply and availability</p> 
Transport	Modal split	<p>With the exception of rail, much of transportation system in the province is relatively well maintained.</p> <p>Rail infrastructure has been decimated following Covid-19 lockdowns resulting in the number of daily train users declining from 13% of transport users in 2013 compared to a mere 2% in 2020.</p> <p>The subsequent increase in taxi and private car usage means increased transport costs and the growth of significantly less sustainable transport modes.</p>	<p>There has been concerted policy efforts to transition towards more sustainable transport patterns. There are also early efforts in place to transition to a low carbon emission through moving to electric buses for economic and environmental benefits. Despite these, the decimation of the rail system in the metro has meant a significant decline in transport sustainability. The reopening of key routes and introduction of some new train sets have started a system use rebound.</p>	<p>Declining</p> 
Open space	No indicator	<p>The lack of open space provision in rapidly developing areas makes it more likely for the development of "Urban heat</p>	<p>There are guidelines for new developments in place (for example in the CCT) to assist in evaluating access to open spaces in efforts to</p>	<p>Insufficient Data</p> 

WESTERN CAPE STATE OF ENVIRONMENT OUTLOOK REPORT 2024

Sector	Indicator	Performance	Outlook	Performance Trend
		islands" which in turn increase energy usage.	enhance wellbeing.	

Chapter 10 Land & Agriculture



LAND & AGRICULTURE

OUTLOOK: STABLE



GAINS

The Western Cape is transitioning to sustainable farming, moving away from harmful practices like agrochemicals and tillage while adopting water management technologies and climate-smart farming. Market pressures such as rising costs and limited arable land also drives this shift to meet food security and land resource conservation needs.



LOSSES

Soil erosion poses a significant threat to land resources in the province, driven by factors such as climate change and improper land use practices. This erosion diminishes agricultural productivity, impacting food security and livelihoods. While other losses, such as those from urban and agricultural expansion due to population growth, are currently minor, they strain land resources.



CONCERNS

Water security and extreme weather events related to temperature rise and changing rainfall variability raise concern for land use practices. The Western Cape must move towards land use practices that are climate-resilient otherwise climate change will exert pressure on land resources leading to increased land degradation.

KEY TREND

The Western Cape faces persistent pressure on its land resources due population growth, urbanisation, urban sprawl, and poverty which exacerbate existing spatial limitations. Agricultural production is closely tied to land resources, but demand often surpasses availability. Occurrences of inappropriate land use, such as intensive farming in threatened areas like Renosterveld, and settlements encroaching on fragile environments like mountainsides causes on-going pressure on land resources. The interface between wildlands and urban areas increases the risk of fires, while coastal development frequently occurs in vulnerable and high-risk zones.



LAND COVER

There has been minimal changes to the Western Cape land cover since 2018, with nominal increase in urban expansion. Land cover change in the Western Cape is currently stable.

Transformation is a result of agricultural activities, urban expansion and degradation and is largely driven by land use. Since 2018, there has been a significant decline in land transformation as a result of agriculture. Land transformation at current more attributed to urban land uses which are also minimal for the current reporting cycle.

LAND TRANSFORMATION



AGRICULTURE & LAND USE POTENTIAL

The Western Cape agricultural footprint is stable to decreasing while the agricultural production is increasing. A concern is the climate change-soil nexus which could intensify an already vulnerable agricultural sector which is dependent on high economic inputs.

- Increased application of conservation agriculture
- Implementation of climate responsive agricultural management
- Sustainability footprints (water, carbon, land) of Western Cape agriculture.

SUSTAINABLE WAY-FORWARD



Outlook: Stable

Key Challenge: Enhancing the Western Cape's land resources and avoiding land degradation to enable land and agricultural adaptability and resilience to climate change, whilst also enabling food security and land use options to support livelihoods across the Western Cape.

Arable land and sensitive ecological systems are scarce resources that must be prioritised in the Western Cape. The growing population, economic development, and global market demands are exerting substantial pressure on land resources. Consequently, there is an urgent need for interventions to prevent and mitigate land degradation, soil loss, and the depletion of vital biodiversity areas.

The Western Cape remains a key player in the horticultural sector, contributing 37% of South Africa's horticultural farm income despite accounting for less than 10% of the country's productive agricultural land, which includes both arable and grazing land (MIR, 2023). The total potential on-farm value of crop production in 2023 was approximately R60 billion—68% higher than in 2017, largely due to the Rand's devaluation and increased commodity prices. While the contribution of orchards, including vineyards, decreased from 79% in 2017 to 66% in 2023, this decline was offset by increases in the production value of vegetables, grain & oilseeds, and lupins (DoA, 2024).

A significant proportion of horticultural farms in the Western Cape are irrigated, which is higher compared to the national average. Ensuring a reliable water supply and an efficient distribution network from bulk water storage to farming communities is critical for sustaining the success of this irrigated sector. Climate change models for the province predict reduced rainfall and higher temperatures in the future, which could lead to decreased water availability and negatively impact both irrigated and rainfed agriculture.


According to the Department of Agriculture's Mapping of Agricultural Commodities Production and Infrastructure in the Western Cape Province (2024), recent mapping data provides highly accurate insights into agricultural land use, with data from 2013, 2017/2018, and 2023. This data reveals a substantial rise in citrus production across the Western Cape, highlighting the region's evolving agricultural capabilities. Additionally, the almond industry has seen significant growth across various districts, including the Cape Winelands, West Coast, Overberg, and Garden Route, indicating a strategic diversification of agricultural output. Conversely, the blueberry industry has contracted, reflecting shifting market dynamics. The

Southern Cape has emerged as a center for high-value crops like kiwi, pecan nuts, avocados, and macadamia, demonstrating a shift towards more profitable agricultural ventures. Meanwhile, the deciduous fruit sector continues to expand, focusing on increasing export volumes, although the canned fruit industry has faced a decline, suggesting challenges within its traditional markets. These changes highlight the region's adaptability and resilience in navigating global agricultural market complexities.


To ensure the sustainable use of land resources, critical actions are necessary. As part of the Western Cape Climate Change Response Framework and the Implementation Plan for Agriculture (SmartAgri Plan), agro-climatic zones (ACZs) have been identified. These zones are based on over 80 relatively homogenous farming areas defined by shared climatic, vegetative, and productive attributes, aimed at representing specific agricultural characteristics and enhancing the sector's adaptability and resilience to climate change. A high-level observation indicates that all of the province's ACZs are under pressure, with some facing increased threats. Any reduction in cultivated land or increase in degraded land affects not only the province's sustainability but also food security, livelihoods, and land use options in the face of climate change. While this reporting cycle did not identify significant change in land degradation, it remains a priority for climate resilience and land resource sustainability.

Balancing land transformation and the potential loss of agricultural land—primarily due to urban expansion—remains critical. The land indicators reported in this chapter suggest a stable outlook, but specific areas of action and pressure points are highlighted below.

Table 7 Land & Agriculture: Outlook Indicators 2024

Indicator	Quantification	Target/Desired State	Trend
Land cover & land transformation	<ul style="list-style-type: none"> 69.3% natural 30.7 transformed – <u>agriculture/urban/degraded/other:</u> <ul style="list-style-type: none"> 12.75% agriculture 1.24% urban 13.4% degraded 3.31% other 	<ul style="list-style-type: none"> Protect/maintain current natural land cover As far as possible prevent further land transformation – minimal if any change in land transformation over past five years Maintain/manage degraded land to prevent increase in degradation 	Stable ¹⁷ 

¹⁷ Care should be taken when interpreting the National Land Cover change assessment information and drawing conclusions. Some apparent changes could be due to changes in classification methods, data quality or data processing techniques – a stable outlook however seems plausible.

<p>Agricultural Land Use and Potential including Land capability¹⁸</p>	<p>The agricultural footprint is stable to decreasing however agricultural production is increasing for the Western Cape.</p> <ul style="list-style-type: none"> • Limited high value agricultural soils - vulnerable agriculture requiring high inputs. • Concern is soil-climate-terrain and the impacts of agriculture, and the implications for agricultural production and resilience. 	<ul style="list-style-type: none"> • Sustainable agricultural practices that enhance /protect/ make use of existing agricultural soils. Importantly, land capability does not equate to agri-potential, which means agricultural potential can be on an improving scale. 	<p>Stable to improving</p> 
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¹⁸ There is increasing need to understand the sustainability of the Western Cape province and the State of Environment Outlook Report should take a critical function in leading this understanding. Therefore, future iterations of the State of Environment Outlook Report could potential exploring moving away from 'land capability' as an indicator towards other indicators that could offer greater sustainability insights, i.e. linking agricultural footprint with water footprint, etc.

Chapter 11 Waste Management



WASTE

OUTLOOK: CONCERN

GAINS



Implementation of diversion initiatives and alternative waste management projects has improved waste diversion rates.

The waste economy has been identified as a key sector for economic growth and job creation. A key focus should thus be to expand waste skills training and job creation initiatives, which is aimed specifically at the youth and other marginalised groups.

LOSSES



A large percentage of provincial sewage sludge is still being disposed at landfill. With limited landfill airspace in the province, municipalities are encouraged to consider diversion and beneficiation options.

CONCERNS



There is an increasing shortage of municipal waste disposal facilities (WDF) airspace and challenges exist around securing available land for new WDFs. Furthermore, inequality in waste management services persist coupled with a lack of service delivery and infrastructure provision in rural areas.

KEY TRENDS

- The total amount of waste generated in the Western Cape province has decreased by 14%, and waste disposal by 4% in the period 2018 to 2022. Waste recovery and recycling have increased by 3% over the same period. For 2022, the Western Cape currently had an overall diversion rate of 29%; and organic waste diversion rate of 22%.
- A problematic trend is the expanding of informal settlements in often unsuitable terrains without waste management service delivery, resulting in waste management challenges such as dumping and pollution – a cost to communities and local authorities.



WASTE GENERATION

Waste generation across the province is increasingly annually (and as a function of local economic status, provincial population growth and consumption patterns). This is placing increasing pressure on already strained airspace of the majority of municipal waste disposal facilities.

Organic waste (food waste (28.9%) plus garden waste (6.3%)) represents the largest portion of waste generated i.e. approximately 35% of municipal waste generated. This offers opportunities for waste diversion and waste economy stimulation.

WASTE CHARACTERISATION



WASTE MANAGEMENT FACILITIES

Western Cape WMFs have reached critical levels in operational capacity. All districts have plans (in different stages) for regional waste facilities and services. Non-compliant WMFs remain significant with license conditions and a matter of provincial concern.

- Expand infrastructure and technological options for waste diversion and beneficiation of organic waste.
- Stimulate societal behaviour change on waste minimisation and separation at source to support recycling initiatives.

SUSTAINABLE WAY-FORWARD



Outlook: Concern

Key Challenge: Waste management facilities across the Western Cape have reached critical levels of operation capacity and this waste management challenge is compounded by widespread non-compliance with regulations, and waste management service provision challenges arising from informal settlements and land invasions.

Waste generation in the Western Cape is currently on a steady rise, after changes in the economy and the impact of the COVID-19 pandemic which resulted in a decrease in waste generation; the latter has now started to increase reflecting broader trends of increasing population and urban expansion. Waste generation is directly influenced by population growth, rising living standards, rapid urbanisation, and economic development. As more people relocate to cities in search of better employment opportunities, quality of life, and improved access to infrastructure and services, it impacts planning, service provision, and resource consumption—key demand-side pressures for the province.

To address this growing challenge, the province has implemented various diversion initiatives and alternative waste management projects. These efforts have successfully improved waste diversion rates, demonstrating progress in managing the region's waste more sustainably. The focus on landfill diversion, and specifically waste beneficiation, has accelerated over the last couple of years, and has been evident at all ends, from government through to business, industry, and the general public. Disposal to landfill is a competing activity to waste beneficiation and continues to be the prominent waste disposal option in South Africa. The estimated waste generated within the Western Cape is 3.31 million tonnes in 2022. General waste accounts for approximately 90% of the waste that is generated (disposal + diversion) within the Province, and the remaining 10% being hazardous waste.

The operational landscape for waste management facilities (WMFs) has also evolved. As of 2022, there is a notable increase in the number of WMFs compared to 2017, largely due to the registration and establishment of facilities that meet the national waste Norms and Standards. However, a significant concern is that Western Cape WMFs **have reached critical levels in operational capacity**. This impending shortfall highlights the urgent need for investment in long-term waste management solutions.

The waste generated within the Western Cape is managed through the 164 general Waste Disposal Facilities (WDFs) in the Western Cape, three hazardous WDFs, three HCRW treatment facilities (2 incinerators and 1 electro thermal deactivation plant) and the limited accredited hazardous waste laboratories. Other WMFs include MRFs, RTSs, drop off and composting facilities.

In 2022, the estimated waste generation in the Western Cape was 3.31 million tons. Of this, approximately 90% was general waste (including both disposal and diversion), while the remaining 10% was hazardous waste. From 2018 to 2022, the total amount of waste generated in the province decreased by 14%, with waste disposal down by 4% and waste recovery and recycling up by 3%. The overall waste diversion rate for the Western Cape in 2022 was 29%, with organic waste diversion at 22%.

Inadequate waste planning has emerged as a significant environmental issue at national, regional, and local levels. The predominant method of waste management in South Africa remains disposal at waste disposal facilities (WDFs), with approximately 90% of waste being directed to these sites.








All districts within the Western Cape are actively developing plans for regional waste facilities and services, each at different stages of progress. Despite these efforts, audits conducted by the DEA&DP during this reporting period reveal that 67% of WMFs are non-compliant with regulations, 23% are partially compliant, and only 10% are fully compliant. This level of non-compliance underscores the challenges faced in maintaining effective and regulated waste management operations.


Compounding these issues are inadequate provision of waste management services for backyard dwellers and the expansion of informal settlements. Many of these informal areas are established on unsuitable terrain, making waste management even more challenging. Additionally, land invasions on both public and private properties further complicate the situation, creating additional pressures on the waste management system.

The waste sector has also been identified as a sector experiencing data challenges. The reporting of waste generation figures is lacking in some of the districts of the Western Cape, and wastewater treatment data is extremely difficult to capture and not available in a central data repository. This is consequently also an area that needs a greater level of data analysis and collection going forward to ascertain the state and outlook of waste management in the Western Cape.

In summary, while there have been positive strides in waste diversion and facility registration, the Western Cape faces significant challenges. These include the limited remaining capacity of WMFs, widespread non-compliance, and the complex issues arising from informal settlements and land invasions. Addressing these challenges will require a concerted effort to enhance waste management infrastructure and services across the province.

Table 8: Waste Management Outlook Indicators 2024

Indicator	Quantification	Target/Desired State	Trend
Waste Generation	<ul style="list-style-type: none"> Waste generation in the province is increasing annually. Waste disposal and diversion data reported to the IPWIS by municipalities and industries is limited. IPWIS verifications are conducted annually to validate the submitted waste data to the IPWIS. 	An increase in waste generation is highly undesirable, including strain on the Western Cape to manage this increase.	Increasing 
	<ul style="list-style-type: none"> Implementation of diversion initiatives and alternative waste management projects has improved waste diversion rates. 	Municipalities are working towards the national diversion target of 50%.	Improving 
Waste Characterisation	<ul style="list-style-type: none"> Organic waste (Food waste (28.9%) plus garden waste (6.3%)) represents the largest portion of waste generated i.e. approximately 35% of municipal waste generated. Glass, plastic and paper also make up a large portion of the waste generated. Meanwhile, household chemicals make up the smallest portion of municipal waste generated. 	Reliable data and information from industry, businesses and households (general and hazardous).	Improving 
Waste Management Facilities	<ul style="list-style-type: none"> Increased number of WMFs that are operational in 2022 vs 2017, due to registration of Norms and Standards waste facilities. 	Sufficient integrated waste management infrastructure (recovery, treatment, general and hazardous WDFs) to deal with projected waste volumes.	Improving 
	<ul style="list-style-type: none"> Majority of the WMF have less than 5 years of operational capacity remaining. 		Concern 
	<ul style="list-style-type: none"> All districts in the Western Province have plans in different stages for regional waste facilities and services. 		Improving 
	<ul style="list-style-type: none"> Based on the Departmental audits done during this reporting period 67% of WMFs are non-compliant, 23% were partially compliant and 10% fully compliant. 	Increase in compliance of WMFs.	Concern 

<p>Waste Collection Services</p>	<ul style="list-style-type: none"> - inadequate services to backyarders, - expanding of informal settlements - unsuitable terrain where informal settlements are established - land invasions on public and private land. 	<p>Access to waste collection services by all communities.</p>	<p>Concern</p> 
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Conclusion

This summary and outlook chapter of the Western Cape State of Environment Outlook Report 2024 should be read alongside the comprehensive chapters written for each theme reported on. It has been highlighted that the Western Cape State of Environment Outlook Report is in a transformative position – and this also pertains to end-user application. Although State of the Environment reports are essential for assessing environmental conditions and sustainability, these reports often fall short because they lack end-user involvement, leading to information that can be unusable, incomplete, or outdated by the time it reaches stakeholders.

To address these issues, a participatory approach is proposed. This approach involves engaging stakeholders throughout the entire reporting process, from design to data collection, analysis, and communication. By integrating stakeholder input from the beginning, the reports become more relevant and actionable. Moving forward, the intention is to respond to this need for dynamic reporting that serves the citizens of the Western Cape by ensuring that State of Environment Outlook Reports are current, relevant, and better suited to their needs, improving overall environmental management and sustainability efforts.

To conclude this summary and outlook chapter, these closing statements are provided:

- **The Western Cape faces natural environment concerns including biodiversity and water resource decline but shows progress with better basic services, improved housing and increased sustainability efforts to management provincial resources.**
- **To reach a sustainable, resilient and equitable outlook, the Western Cape must address climate change adaptation and mitigation, funding constraints and implement innovative solutions across all of its sectors.**
- **For future Western Cape State of Environment Outlook reporting, it may be beneficial to involve stakeholders in setting objectives, use local knowledge for data collection and engage citizens in data analysis to ensure heightened use and citizen-applicability of findings and outcomes.**

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