



**Western Cape
Government**

Environmental Affairs and
Development Planning

BETTER TOGETHER.

State of Environment Outlook Report for the Western Cape Province

Environmental Outlook

February 2018

DOCUMENT DESCRIPTION

Document Title and Version:

Final Environmental Outlook

Client:

Western Cape Department of Environmental Affairs & Development Planning

Project Name:

State of Environment Outlook Report for the Western Cape Province 2014 - 2017

SRK Reference Number:

507350

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Page 28 – Environment People Law

Date:

February 2018

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ABBREVIATIONS AND ACRONYMS

CBA	Critical Biodiversity Area
CSIR	Council for Scientific and Industrial Research
DEA&DP	Department of Environmental Affairs and Development Planning
DHS	Department of Human Settlements
ESA	Ecological Support Area
GHG	Greenhouse Gas
IDP	Integrated Development Plan
IRP	Integrated Resource Plan
MPA	Marine Protected Area
MWp	Megawatt peak
NDP	National Development Plan
NLC	National Land Cover
SANBI	South African National Biodiversity Institute
SoEOR	State of the Environment Outlook Report
TOD	Transit Oriented Development
WCG	Western Cape Government
WMF	Waste Management Facility

GLOSSARY

Green Drop	Green Drop status implies excellent wastewater management and a respect for the environment and the health of the community at large.
Greenhouse gas	Any gas that absorbs infrared radiation in the atmosphere, thus allowing heat to enter the earth's atmosphere but not to leave it.
Industrial symbiosis	Industrial symbiosis is an association between two or more industrial facilities or companies in which the wastes or byproducts of one become the raw materials for another.
Regionalisation	Refers to the bundling of municipal waste management needs of several towns or cities by creating one regional facility.
Transgenic	An organism that contains genetic material into which DNA from an unrelated organism has been artificially introduced.

1 WESTERN CAPE OUTLOOK: 2018

The State of Environment Outlook Report (SoEOR) presents information on the current level of provincial performance in terms of environmental sustainability thresholds. The report is intended to provide a broad audience with an update on the province's environmental conditions between 2014 and 2017 reported on in terms of nine environmental themes and records the efforts made by government to respond to environmental change. A summary of the findings is presented below, highlighting important issues per theme as well as linkages between themes.

For each environmental theme in this report, an outlook is presented, categorised as:

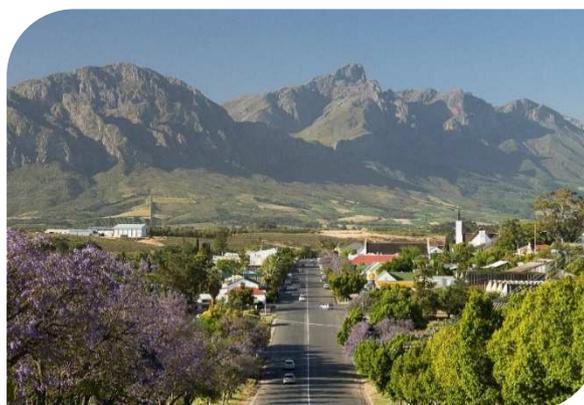
- **Improving** – implying that the environmental conditions are improving and societal responses are steering change in the right direction; or
- **Declining** – in cases where the indicators show a negative trend and/or the necessary societal response is not deemed to support environmental sustainability; or
- **Stable** – where indicators show neither a negative nor positive trend, and indications are that societal responses to the concerns are generally positive.

1.1 Land

OUTLOOK: INSUFFICIENT DATA BUT APPEARS TO BE DECLINING

The unsustainable use of land resources in the Western Cape requires critical action by the Western Cape Government (WCG). Any loss of or reduction in cultivated land and increase in the extent of degraded land, as evident in the central part of the Western Cape, will affect provincial food security, livelihoods and land use options. Unless processes are implemented to address growing rates of land transformation and the loss of agricultural land resources, the state of land in the province will continue to decline.

Data relating to land cover change and transformation is outdated or inconsistent, hampering evaluation of the rate of land transformation in the Western Cape. Transformation of land is however ongoing, reducing natural land cover. The principal recommendation with respect to the long-term management of land in the province is to urgently update land cover data to more accurately ascertain pressures and impacts on land and direct more focused land use management in these areas.



The amount of cultivated land has decreased since 2013, although the exact change is difficult to evaluate due to deficient data sets. Climate change, increasing population, economic development and global market pressures all exert pressure on land, which warrant interventions to reduce current rates of land degradation, soil loss and loss of critical biodiversity areas.

Although there are a number of key responses aimed at agriculture, given the multitude of land uses in the Western Cape and the intrinsic links between land use and social and economic dynamics in the province, responses to land use change need to be multi-

sectoral. Capacitating and upskilling those who work in land policy, legislation and regulation, as well as educating land users, will ensure effective responses to land challenges and impacts. This will require collaboration by a range of stakeholders in the private and public sectors.

1.2 Biodiversity and Ecosystem Health

OUTLOOK: DECLINING

The Province has experienced a decline in the Ecosystem threat status of vegetation types, primarily due to habitat loss and a loss in excess of 19 000 ha of Critical Biodiversity Areas (CBAs) in recent years, with the extent of habitat degradation increasing by 16% between 2009 and 2014. While the species threat status of some species has improved, the threat status of others, particularly those in the endangered and critically endangered threat categories has further deteriorated, demonstrating a continued negative trend during the reporting period. An improvement was experienced in the ecosystem protection level of vegetation types due to the establishment of new, or the expansion of existing, protected areas. Insufficient data was available to assess the status of invasive alien species.



At present, the Western Cape's unique and threatened biodiversity resources are being depleted at a faster rate than they can be safeguarded. As a result, a total of 14 additional ecosystems qualify for national listing as threatened since the 2011 gazetting of threatened ecosystems. The continued loss of natural habitat, particularly in 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 illegal land clearing activities in CBA's are stopped with effective action taken against transgressors.

Greater effort is required to mainstream and safeguard the priorities identified in the 2017 Western Cape Biodiversity Spatial Plan, the City of Cape Town Bioregional Plan, the Biodiversity Sector Plans for each of the District Municipalities, and local biodiversity implementation initiatives. Action must be taken to procure the next land cover time-step to facilitate comparison with 2013/14 land cover information. The design and implementation of a development and environmental authorisation tracking tool to enable reporting on legitimate and illegal land conversion would also greatly aid biodiversity conservation efforts.

1.3 Inland Water

OUTLOOK: DECLINING

The extended and extreme drought in the Western Cape has led to the declaration of the province as a disaster area, while the substantial population growth in the province in recent years has placed significant additional pressure on available water resources. The state of most inland water is poor with poor water quality in many locations, over-abstraction and extensively impacted ecosystems. While many towns currently have sufficient water to meet their needs, a number already have a water deficit. With

increased demand and reduced rainfall, more towns are likely to experience a deficit in the absence of adequate planning and implementation of demand management and alternative water supply projects, given the high current level of reliance on natural surface water resources.



More than half of monitoring stations in catchments are recording “intolerable” water quality at times,

while invasive alien vegetation is having a deleterious impact on both surface and groundwater resources. Linked to climate change, water quality is expected to deteriorate due to droughts and increasing fires.

Water quality in just over 10% of rivers and wetlands with largely unmodified ecosystems is considered “ideal” for use. Most groundwater resources are still sustainably harvested and of good quality. However, these resources require ongoing management and robust data collection to inform future decisions regarding long term exploitation of groundwater. This has become more critical in light of the rapid increase in private and proposed municipal groundwater abstraction in response to the drought, which will also affect groundwater infiltration and aquifer recharge.

The trends in the state of inland water quality are less clear, primarily due to an absence of historical data, inconsistent data collection, inconsistent analytical methodologies and the prohibitive cost of some analyses; however the overall poor state indicates a decline. These limitations should be resolved; however, it must be recognised that funds are limited and society will have to decide whether to allocate funds to improved data management or to other essential services which also compete for funds/tax revenues.

1.4 Oceans and Coasts

OUTLOOK: DECLINING

Anthropogenic activities impact on the dynamic and sensitive coastal and marine environments in a number of ways, as demonstrated by the changes to these environments over time. The critically endangered or endangered ecosystem threat status of large areas of marine ecosystems and the high levels of transformation of terrestrial threatened ecosystems in the coastal belt, mostly due to human activity, are of particular concern.



These impacts are exacerbated by climate change, further contributing to a deteriorating state of the marine and coastal environment. In addition, there has been a substantial increase in the number of buildings developed in high risk coastal zones and estuary health remains of high concern.

Data regarding marine protected areas (MPAs) is not directly comparable to historic data and many of the challenges

previously identified persist, however proposals are in place to expand three MPAs in the Western Cape: Betty's Bay, Robberg and Goukamma, in terms of the National protected Areas Expansions Strategy, and supported by Operation Phakisa.

A substantial increase in the number of Blue Flag beaches in the Western Cape indicates both an increased interest in monitoring coastal water quality as well as an increase in the number of beaches achieving the required water quality standards – which would be indicative of improved water quality in these areas.

Significant progress has been made in terms of legal and institutional responses to marine issues in the Western Cape. The development of estuary management plans, coastal management 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.

1.5 Human Settlements

OUTLOOK: STABLE

Sustainable approaches to development and maintenance of human settlements in the Western Cape are critical for the health and wellbeing of communities and natural systems. Projected population growth, paired with the housing and basic service delivery requirements for settlements, are increasing pollution and waste, transforming productive land and deleteriously affecting ecologically sensitive areas and biodiversity.



Legislation governing human settlements is outdated, but is being addressed in the Green Paper on Human Settlements and revision of the National Housing Code. This will improve legislation governing the planning, design and development of settlements, in a sustainable and integrated manner (DHS, 2015). The Living Cape: Human Settlement Framework (2017) and the Western Cape Informal Settlement Strategic Framework (2016) are two key policy responses aimed at improving the quality of human settlements.

Integrated planning has not been fully effected in the Western Cape, hampering planning and delivery of sustainable human settlements. Integrated planning and a better understanding of mandates and responsibilities across municipal departments will expedite identification of strategic priorities and better coordination of resources (WCG, 2014). While the Western Cape is considered the best performer in the country in terms of overall service delivery, maintaining service delivery levels remains challenging, particularly for housing where increased demand, notably in urban centres, far exceeds supply (Western Cape Treasury, 2016).

The challenge in the Western Cape is to reduce the impact of human settlements on the natural environment while still meeting basic socio-economic requirements. While legislation is in place to guide sustainable development of human settlements better implementation and enforcement of existing provisions or changes to policy and service delivery models is required. Innovative design and technology are important mechanisms

to achieve the right balance between socio-economic needs and environmental well-being. Also, more efficient and effective land use is required, supported by a more integrated, cross-sectoral approach.

1.6 Air Quality

OUTLOOK: STABLE WITH A SLIGHT IMPROVEMENT

Air pollution knows no boundaries, as pollutants can easily disperse widely. By reducing air pollution, associated acute and chronic health effects, such as respiratory illness, and the adverse effects on the environment, are reduced. The major drivers of air pollution include industrialisation, transportation and the use of domestic fuels, including wood, for cooking and heating.



The number of air quality monitoring stations within the province has increased steadily, affording the authorities a better understanding of the state of air quality. The overall air quality situation within the Western Cape Province is positive insofar as ambient air quality monitoring information indicates that air quality is largely compliant with the South African National Ambient Air Quality Standards, with a gradual improvement evident. However, various air pollution hotspots, mainly around large

settlement and industrial nodes, are evident and ongoing management is required in order to maintain acceptable levels of air quality across the province.

Additional monitoring would help determine the spatial and temporal extent of pollution sources and concentrations, to guide action to improve air quality. The lack of consistent long-term air quality monitoring records constrains air quality management in the province: it is therefore imperative that more consistent monitoring be undertaken, a better spatial coverage be achieved and that operational procedures and processes for instrument repair and maintenance be reviewed to reduce data losses (DEA&DP, 2011).

1.7 Climate Change

OUTLOOK: DECLINING

Climate change and associated impacts only manifest slowly and it is sometimes difficult to identify clear trends in climate patterns or the effectiveness of responses. However, there is recognition of the effects of climate change, as pressures, such as water shortages and rising food costs, mount. It is therefore necessary to acknowledge the Western Cape's contribution to the problem, and



prepare for the impacts that climate change will have on the socio-political and socio-economic functioning of the province.

The Western Cape's greenhouse gas (GHG) emissions decreased between 2009 and 2013 but increased in 2016, while per capita GHG emissions decreased between 2009 and 2013 and stabilised through to 2016. This would indicate that between these periods, GHG emissions in the province were lower and less intense. Analysis confirms that most emissions are from the transportation and industrial sectors, and efforts can therefore target improved efficiency to lower the GHG impact in these sectors. Recent climate trends in the Western Cape, include rising temperatures and reductions in the number of rain events in autumn and summer.

Climate change is a global issue with local consequences, requiring both collective global and local solutions. The complexity and the interconnectedness of climate change means that the province does not have direct control or influence over many drivers. As such the province has to adapt/respond to climate change challenges based on mitigatory measures implemented in the province, and also by other role-players. Nevertheless, the province has pro-actively developed and implemented intra - and cross-sectoral policies to respond to climate change. In this regard, the province, together with its stakeholders and partners, has seen demonstrable achievements and continues to build on a solid policy foundation which is increasing and enhancing the overall resilience of the province.

1.8 Energy

OUTLOOK: STABLE

While the Western Cape's energy supply remains dominated by conventional technologies and fossil fuels, there is a concerted move from non-renewable to renewable energy, and energy security, with firm targets set and many projects and programmes underway. As regards responses to improve energy efficiency, encourage investment in renewable energy and work towards energy security into the future, the Western Cape is performing very well. Financial difficulties facing Eskom, in tandem with an unpredictable policy environment, have created a state of uncertainty in South Africa's energy sector.



Although there has been a concerted drive to increase renewable energy sources in the Western Cape, energy use per capita and overall energy use in the province has increased since 2013.

Compared to the other provinces, the Western Cape leads in terms of electrified homes, and most of the population has direct access to electricity. Although the Western Cape population increased by over 150 000 between 2011 and 2016, the proportion of electrified homes also

increased. Nevertheless, a small portion of the population either does not have access to electricity off the national grid or cannot afford electricity. These people typically resort to biomass for cooking, lighting and heating, which comes with a range of associated undesirable consequences. In addition, the reliability of energy supply in the province remains a concern.

Effort should be focused on the collection of energy generation and usage data in the province, in order to provide an accurate depiction of the energy sector in the Western Cape. This would include information on independent generation of renewable energy. Attention should also be focused on removing regulatory obstacles prohibiting private microgeneration supplementing the main electricity supply grid.

1.9 Waste Management

OUTLOOK: CONCERN

Waste generation is a direct consequence of an increase in population, a rise in living standards, rapid urbanisation and economic growth. More people are moving into cities in search of employment and a better quality of life, and better access to infrastructure and services. This has implications for planning, service provision and resource consumption, all key demand side pressures for the province.

The province has a shortage of airspace and securing available land for new waste management facilities (WMFs) is difficult, as there is increasing competition for land. Other challenges include the prohibitive cost of containment barriers for WMFs, as prescribed by the National Norms and Standards for Disposal of Waste to Landfill (2013). Integrated waste management infrastructure is not regarded as bulk infrastructure and, therefore, limited State funds have been allocated for new developments, resulting in service delivery backlogs and limited landfill airspace. Regionalisation is considered as a potential solution to airspace shortages.



In recent years, the Western Cape has made significant strides in improving waste management and - more importantly - the integration of sustainable practices that recognise waste as a resource. Examples of these are an in-depth Department of Environmental Affairs and Development Planning (DEA&DP) waste characterisation survey conducted in 2007 to improve information on municipal waste streams, the 2Wise2Waste resource efficiency programme, waste management in education project, green procurement guideline, recycling and

the annual Cleanest Town Competition (now part of the Greenest Municipality Competition).

2 EMERGING ISSUES

A number of emerging issues/activities/planning policies, which are likely to place additional pressure on the environment in the Western Cape, have been identified. Although not yet key drivers of environmental change, they have the potential to intensify negative effects or create adverse effects in the future. These issues should be flagged for further study and concerted attention to preempt and manage the potential pressure on the environment, and may inform additional indicators in future iterations of the SoEOR.

2.1 Ongoing Effects of climate change

The on-going critical drought, increases in temperature and fires in the Western Cape make it increasingly apparent that the Western Cape, particularly the western sectors of the province, are exceedingly vulnerable to the effects of climate change. Creeping drought events, wild fires and large storm events have and will continue to place pressure on and affect resources. Going forward, the province will have to ensure that natural and man-made infrastructure is resilient and prepared for climate events. This is particularly critical for the agriculture sector, food security and urban settlements (informal settlements), which are most vulnerable to climate change.

Ultimately, extreme climate events will jeopardise ecosystem services, which will deteriorate as climate change effects continue to increase in the province. The challenge to the province is to formulate and present effective adaptation and mitigation responses, especially for vulnerable communities and municipalities. Climate change in the province is very real and, as a result, the spatial implications of climate change including sea level rise and flooding in coastal and low-lying areas, are better understood.

Climate change is a growing concern for the food-energy-water nexus, and investigations are currently underway to ensure that the nexus is covered in adaptation and mitigation measures implemented by the province.

2.1.1 Effects of drought on water resources

The prolonged drought that continues to affect the Western Cape (the province was declared a disaster area in 2017) has highlighted the severe risks to the Western Cape's water provision. The demand for water has steadily increased due to the population and economic growth, and dams in the province are at a 30-year low. The factors illustrated in the diagram below (Figure 2-1) have coincided to create "the perfect storm" constraining water resources (Winter, 2017).



Figure 2-1: "Water Resources: the perfect storm"

2.1.2 Climate change adaptation and mitigation

The Western Cape is forging ahead in South Africa's response to climate change, particularly climate adaptation and mitigation. Climate Change Response documents outlining necessary and practical adaptation measures have been implemented and incorporated into relevant provincial planning mechanisms (DEA&DP, 2014). This is particularly important to identify vulnerable communities and make them more resilient to the effects of climate change. The province continues to align and integrate climate change adaptation strategies into existing and future policy.

To mitigate climate change, renewable energy has been earmarked for intensive development in the next ten years, while a number of adaptation practices are currently being implemented across the province. Adaptation focus areas relating to land include (WCG, 2014):

- Water conservation and demand management;
- Built environment adaptation; and
- Ecosystem based adaptation.

2.2 Increased renewable energy developments

The global uptake of renewable energy continues unabated. Government policy continues to favour and support the inclusion of cleaner energy, including renewable energy, as encapsulated in the Integrated Resource Plan (IRP) update released in 2016. Though not finalised, the updated IRP provides continued policy certainty, while the 6 300 MWp that has been allocated for further renewable procurement provides a credible estimate of the potential market size (GreenCape, 2017). Eskom's current reluctance to enter into Purchase Power Agreements has clouded policy certainty and may deter investment in renewables.

Numerous plans and initiatives in the Western Cape aim to reduce reliance on the national grid, largely based on renewable alternatives. The installation of rooftop solar PV is to be the major driver of this, although more options will be required. In light of the move away from non-renewable energy sources, pressure will be put on those renewable energy sources available in the Western Cape, particularly solar and wind energy. These facilities require a significant landtake and increased pressure to find suitable land while still supporting other land uses will become a growing problem in the province. This will have ramifications for sense of place and the aesthetic value of the Western Cape landscape, and place pressure on biodiversity.

The impacts of wind facilities on biodiversity in the Western Cape are not well understood; however, recent studies indicate that bat, bird and insect populations at some locations are being substantially affected by mortalities due to collisions with wind turbines.

The threat to regional ecological connectivity, which extends beyond the footprints of wind facilities, is another concern.

2.3 Shale gas prospecting

Hydraulic fracturing to extract shale gas is contentious, particularly in the Western Cape, requiring further studies to frame the extent and viability of gas reserves. The viability of extracting shale gas reserves within the Karoo Basin is not yet proven, with estimates of available reserves varying widely. Shale gas exploration can contribute to addressing these knowledge gaps (DEA&DP, 2017).

To date, several energy companies have lodged applications for exploration rights. The Minister of Mineral Resources may award the first shale gas exploration licences in late 2017, delayed by environmental objections which necessitated further investigation during the process (Roelf, 2017). The production of shale gas is seen as an alternative energy source for South Africa which relies heavily on coal.



At present, there is still significant uncertainty about the likely impacts of shale gas exploration in South Africa, specifically within the Central Karoo District Municipality. Proponents of shale gas point to its (clean) energy and economic benefits, while opponents are concerned about potentially adverse environmental impacts, including risks of groundwater pollution especially in light of

groundwater being the Karoo's key water source. Other concerns include the high volumes of water required (in a water-stressed, arid environment), increased GHG emissions compared to renewable energy production, and loss of biodiversity (Blaine, 2014; Hedden et al., 2014). From a socio-economic perspective, it is recognised that the majority of the benefits will accrue outside the Central Karoo, unless downstream developments including gas processing facilities and power generation are developed in the region. Local job opportunities and economic activities are expected to be limited (DEA&DP, 2017) which points to the need for investing and actively designing sustainable alternative livelihoods for local communities.

Some other key concerns to bear in mind with regard to future land issues and the impacts of shale gas extraction include (CSIR, 2016):

- Community unrest over proposed fracking;
- Surface land rights; and
- Impact on receiving infrastructure and services.

DEA&DP has identified information gathering and evidence-based policy development as key priorities to guide shale gas development decision-making (DEA&DP, 2017).

2.4 Increase in sand mining

Mining in the Western Cape is insignificant compared to the rest of the country, however limestone, dolomite, sand, salt and diamond mining and quarrying all occur in the province. In particular, sand mines are proliferating in the West Coast and the Swartland. For example, in 2017 the Department of Mineral Resources approved controversial sand mining permits for two farms located in close proximity to local wine farms, within the Swartland District Municipality. Further sand mining could affect land use, biodiversity and the coastal environment.

2.5 Smart Growth and Transit Oriented Development

Smart Growth is an approach to development that encourages the mixed use of building types and uses, diverse housing and transportation options and development within

existing human settlements, supported by community engagement. In the Western Cape, Smart Growth is expedited through the efficient use of land and infrastructure to contain urban sprawl and prioritise infill, densification and redevelopment (WCG, 2014).

Transit Oriented Development (TOD) accommodates a mixture of housing, office, retail and/or other amenities integrated into a walkable neighbourhood located reasonably close to public transport systems. Benefits of TOD include (City of Cape Town, 2016):

- Reduced household driving and consequently lowered traffic congestion, air pollution and GHG emissions;
- Walkable communities that encourage healthy and active lifestyles;
- Increased use of public transport and fare revenue;
- Improved access to jobs and economic opportunities for low-income groups and working families; and
- Expanded mobility choices that reduce dependence on cars, reduce transportation costs and free up household income for other purposes.

TOD is gaining traction in South Africa, with the National Development Plan calling for the principles of TOD to be utilised wherever possible. TOD can be employed as a means to address urbanisation, traffic congestion and spatial inequality, as well as to provide access to employment, reduce energy consumption associated with transport and improve air quality.

2.6 Need to preserve sense of place

The Western Cape is famed for scenic landscapes, historic settlements and the sense of place associated with them. These are increasingly threatened by inappropriate and poorly conceived developments (such as housing at the foot of the mountains in Barrydale, pictured right) that diminish the unique identity and experience of vistas, spaces and towns. This can be addressed assigning value to scenic routes and cultural landscapes and by improving human settlements management systems and ensuring that the appropriate sustainable development considerations are prioritised (WCG, 2014).



2.7 Shortage of landfill airspace

With increasing population, economic growth and relative prosperity in the province comes increased production and consumption, and concomitant waste generation. The volume of waste generated in the province between 2001 and 2010 far exceeded the rate of population and economic growth. Approximately 90% of waste generated in South Africa reports to WMFs. Currently, the Western Cape has 164 general WMFs, three hazardous WMFs, few accredited hazardous waste laboratories, two incinerators and a single electro thermal deactivation plant – the last two treating medical waste.

There is an imminent shortage of landfill airspace, and securing land for new WMFs is proving difficult. Only nine WMFs in the province have 10 or more years' airspace remaining, and new WMFs will need to be constructed. Alternatively, more waste must be

diverted from WMFs for reuse, composting or recycling, or reduced at source. Land for new WMF's could affect human settlements, land use, biodiversity and water resources in close proximity to new facilities.

2.8 Declining pollinator populations

A growing body of literature points to a global decline in populations of pollinator species such as bees, bumblebees, moths, flies, wasps, beetles, birds and bats. The decline has been attributed to various factors including exposure to pathogens, parasites, and pesticides; habitat fragmentation, degradation and loss; climate change; market forces; intra- and inter-specific competition with native and invasive species; invasive plant species; bee genetics; and transgenic crops, amongst others (National Research Council of the National Academies, 2007).

Declining pollinator populations pose a serious and far-reaching challenge that needs to be addressed to ensure the sustainability of food production systems (fruits, vegetables and nuts), avoid additional economic impacts on the agricultural sector, and protect the health of the environment (United States Government, 2014).

3 RESPONDING TO ENVIRONMENTAL CHANGE

Evaluation of environmental themes and identification of the most effective environmental management interventions, serve to consolidate guidance on which key actions will best deliver a sustainable Western Cape. If addressed with the necessary urgency and resources, these actions will ensure that development is sustainable.

The proposed priority actions aim to achieve Strategic Goal 4 of the Western Cape Provincial Strategic Plan 2014 – 2019: *Enable a resilient, sustainable, quality and inclusive living environment* and strive to meet the UN Sustainable Development Goals.

Priority actions can be categorised in five themes, namely the built environment and infrastructure, strengthening of ecosystem services, reduction of wastage, good governance and building of resilient communities, each addressed in the sub-sections that follow.

3.1 Sustainable Built Environment and Infrastructure

Many advances can be made in the built environment to reduce resource use and pollution. This sector not only lends itself to improvements in energy, water and waste efficiencies, but improvements in building performance have other benefits, such as reducing living costs and improving human health.

Key actions required to initiate radical long-term changes or maintain the momentum of current initiatives include:

- Addressing challenges to innovative green urban development and off-grid infrastructure;
- Stimulating large-scale changes to energy and transport systems (enable and support renewable energy development and waste to energy initiatives);
- Identifying new funding mechanisms; and
- Adopting integrated planning approaches that align development actions and remove duplication or conflicts of action.

3.2 Actively Strengthen Ecosystem Services

The provincial economy, and indeed much of the unique environment that attracts people to the Western Cape, is dependent on a functioning ecological system. It is imperative that efforts be directed at maintaining the integrity of natural systems. In this regard, sensitive or critical natural elements have to be protected, and the slow deterioration of the overall system must be arrested. Key interventions are:

- Active protection and enhancement of natural resources that provide ecological goods and services, with specific focus on improving the living conditions of the poor;
- Protection for Critical Biodiversity Areas and adoption of biodiversity planning in local Spatial Development Frameworks;
- Restoration of degraded riverine habitat and corridors;
- Active development of green infrastructure; and
- Implementation of coastal management plans to protect sensitive marine and estuarine ecosystems, and improve the understanding and management of coastal dynamics and marine ecosystems.

3.3 Curb Wastage of Resources

Improving the efficiency of resource use will reduce the amount of resources extracted as well as the volume of waste disposed. Most of the improvements in efficiency will result in systematic cost savings. Recommended key actions include:

- Increasing options for water reuse and curbing of reticulation water losses;
- Supporting conservation agriculture where it relates to use of water – i.e. more 'crop per drop';
- Implementing actions and strategies to address energy intensity and dependencies;
- Removing regulatory constraints that inhibit reuse of waste and industrial symbiosis;
- Transforming traditional perceptions of waste so that waste is viewed as a resource and not a liability; and
- Introducing incentives to reduce waste, including an appropriate approach to removing organic material from the waste stream.

3.4 Good Governance

The National Development Plan (NDP) 2030 is unequivocally clear that good governance is a pre-condition for sustainable and equitable social and economic transformation. Two essential government responsibilities are information gathering and integrated planning. These need to be implemented through:

- Proper licensing of waste management facilities and reliable reporting of volumes and types of waste;
- Improving the extent of and coordinating air quality monitoring;
- Updating information on land cover;
- Gathering information on private sector initiatives in the waste, air quality, energy and climate change adaptation fields;

- Enhancing systems for integrated planning and implementation, especially in terms of biodiversity and ecosystem vulnerability.
- Ensuring environmental sector plans are up to date and assimilated into IDP priorities.

3.5 Build Resilient Communities Which Can Earn a Living

Sustainable development is as much dependent on maintaining human welfare as it is on respecting the capacity of natural systems. The challenge is to find developmental strategies and solutions that can satisfy both requirements, or at least benefit one without compromising the other. Specifically in the Western Cape, the most urgent human welfare focused actions are:

- Adopting and supporting large scale conservation agriculture;
- Implementing sustainable coastal livelihoods programmes;
- Actively supporting Green Economy development; and
- Developing and implementing local climate change adaptation plans.

4 ENVIRONMENTAL GOVERNANCE AND POLICY ALIGNMENT

4.1 Policy Alignment

There is a high level of convergence between policy and action identified through the State of Environment Outlook analysis and existing policy directives and strategic planning initiatives in the Western Cape. Alignments or synergies between National and Provincial policy directives are documented in government plans for the country, its people and the environment. These directives have typically been defined through an analysis of gaps, challenges and growth opportunities. The evidence of convergent strategic direction confirms key priorities for action to improve the state of the environment and sustainable development.

4.2 Who is Responsible to Drive Change

No amount of prioritisation or policy formulation will effect change unless entities and institutions take responsibility to implement the recommended actions. Many of the identified trends for the Western Cape cut across disciplines, and an integrated and co-ordinated approach to implementing change, with a strong focus on governance, policy alignment and service delivery, will be required.

While national and provincial policy provides an overarching framework, it is important that a focal point is created for implementation. The Municipal System Act 32 of 2000 allows local Integrated Development Plans to serve as the focal point to ensure local action. Local Authorities are at the “coal-face” of environmental sustainability, because they have tremendous influence over infrastructure development, the effectiveness of resource use, spatial development patterns, human welfare and the protection of ecosystem goods and services. The Constitution mandates the responsibility for environmental management to Local Authorities, but it is often argued that the environmental function is not adequately funded.

Environmental management is nearly always more a matter of responsible execution of standard operational activities rather than discrete activities. The Municipal System Act 32 of 2000 requires that municipal tasks must be undertaken in accord with the natural

environment, for the social and economic upliftment of communities. The implementation of an integrated, resource-efficient public transport system, for example, is as much related to sustainability and environmental responsibility as it is to social welfare and the building of functional urban areas.

What is important is that clear direction is provided as to how change needs to be made, by whom and by when, and that it is shown how everyday execution of governance mandates can realise environmental sustainability. This needs to be an ongoing, iterative process with free flow of communication at all levels, so that such processes are not undertaken in isolation.

4.3 Data Requirements

The SoEOR is but one example of a document which consolidate monitoring data to inform decision-making and policy formulation. The quality of reporting and, therefore, the value of the decision-making support, is dependent on the quality of the data that is available. Ideally, complete datasets with consistent long term records should be available, but in practice such sets are rare. Often, data collection is subject to financial and human resource constraints, technical challenges, or is only available for short periods. As a consequence, the SoEOR relies on critical indicators that are specifically selected because of their potential as proxies for more complete data sets. In some cases these indicators were used in the previous State of Environment Report for the Western Cape, but in others are new and intended as baseline or benchmark indicators for future iterations of the report.

A number of challenges encountered in compiling the SoEOR, including gaps in information, inconsistent reporting, inadequate data storage as well as the lack of suitable data should be addressed as a priority in preparation for future iterations of the SoEOR. An integrated data collection and repository/management system, ensuring controlled data collection, the safe storage of data and protection of intellectual property rights would substantially improve reporting capabilities in future.

5 CONCLUDING STATEMENTS

The Western Cape is custodian of a rich, varied and treasured natural environment, which sustains the livelihoods of everyone in the province, whether through the provision of foodstuffs or as building blocks for the diverse economy. This report shows that the pressures on natural systems are unsustainable: more needs to be done to protect critically sensitive or important environmental features, without which the ability of the region to adapt to impacts from increasing population and climate change is uncertain.

Table 6-1 summarises environmental indicators reported in the State of Environment Outlook Report. Where “insufficient data” is cited, it often implies that the comparative datasets to detect trends is not available. Worryingly, declining trends are a feature of most biophysical themes. The state of land, biodiversity and ecosystem health, inland water, climate change, oceans and coasts, and waste management are declining or of concern, with a stable outlook for human settlements and air quality. Energy is improving.

Declining trends reported in the SoEOR clearly align with two of the World Economic Forum's Global Risks for 2017 under the environmental category: extreme weather events and water crises. Not responding timeously and effectively to declining trends in environmental health can lead to other key risks: failing to meet sustainability and resilience goals.

Table 6-1: Summary of SoEOR environmental indicators

Indicator	Key Quantifications	Target	Trend
LAND: INSUFFICIENT DATA BUT APPEARS TO BE DECLINING			
Land cover	<ul style="list-style-type: none"> 65.2% natural 33.5% transformed (16.8% degraded, 15.1% agriculture, 0.9% urban, 0.6% plantations) 	Protect natural land cover Prevent further land transformation	Declining 
Land capability	<ul style="list-style-type: none"> No high value agricultural soils - vulnerable agriculture requiring high inputs 	Sustainable agricultural practices that enhance the value of existing agricultural soils	Insufficient Historical Data 
Land transformation	<ul style="list-style-type: none"> Decrease in cultivation by 3.5% 16.2% more degradation 	Prevent further degradation	Declining 
BIODIVERSITY AND ECOSYSTEM HEALTH: DECLINING			
Ecosystem threat status	<ul style="list-style-type: none"> Increase in threat status for some vegetation types due to habitat loss 	Maintain or decrease the threat status	Declining 
Ecosystem protection level	<ul style="list-style-type: none"> 43 ecosystems well protected (up by 8) 21 moderately protected (up by 12) 56 poorly protected (down by 20) 43 not protected (up by 15) Additional 24 214.5 ha protected 	Increase protection category of all ecosystems Increase total extent of areas formally protected	Improving 
Biodiversity priority areas	<ul style="list-style-type: none"> Loss of 19 270ha of CBAs¹ 	No loss of CBAs and increase in CBAs secured in protected areas	Declining 
Habitat degradation	<ul style="list-style-type: none"> 16.2% increase in degraded land between 2009 and 2014. 	Reduction in the extent of degraded land	Declining 
Species threat status (Species)	<ul style="list-style-type: none"> 50 species have higher IUCN Red List threatened status (mainly in Critically Endangered and Endangered categories) 58 species have improved in IUCN Red List threatened status 	Reduction in the Red List status of species	Declining 
Alien invasive species	<ul style="list-style-type: none"> Lack of appropriate comparable data 	Reduction in density and distribution of alien invasive species	Insufficient data 

¹ Due to inconsistencies in data sources, this extent of loss should not be treated as absolutely accurate.

Indicator	Key Quantifications	Target	Trend
INLAND WATER: DECLINING			
Water availability	<ul style="list-style-type: none"> Western Cape declared a disaster area due to severe drought. 12 % of towns have inadequate yield 27% of towns exceed water supply allocation 12% expect a deficit in 0 – 5 years 49% expect a deficit in > 5 years Insufficient water supply in WCWSS by 2018 	<p>No unsustainable abstraction</p> <p>Adequate water supply for all towns</p>	<p>Declining</p> 
Water quality fitness for use	<p>Fitness for use at river monitoring stations:</p> <ul style="list-style-type: none"> 13% ideal 30% acceptable or tolerable 57% intolerable 26 stations have extremely high levels of microbial contamination 	<p>No intolerable water quality</p> <p>No stations with extremely high levels of microbial contamination</p>	<p>Declining</p> 
Freshwater ecosystem health	<p>Ecological state of rivers (PES):</p> <ul style="list-style-type: none"> 21% unmodified, natural 28% largely natural 17% moderately modified 26% largely modified 6% seriously modified 1% critically or extremely modified 	<p>No freshwater systems seriously or critically modified</p>	<p>Declining</p> 
OCEANS AND COASTS: DECLINING			
Coastal water quality	<ul style="list-style-type: none"> Increase in Blue Flag Beaches from 18 to 31 indicative of good coastal water quality. 	<p>Coastal water quality compliant with relevant standards</p>	<p>Improving</p> 
Estuary health	<ul style="list-style-type: none"> 4% of estuarine areas in good or excellent condition 95% of estuarine areas in fair condition 1% of estuarine areas in poor or non-functional condition. 	<p>No non-functional estuaries</p> <p>No decline in estuary health</p>	<p>High concern</p> 
Conservation areas	<ul style="list-style-type: none"> 9 MPAs Persistent challenges Increased recognition of management functions 	<p>Increase in extent and good management of MPAs</p>	<p>Data not comparable</p> 
Marine area threats	<ul style="list-style-type: none"> No change to critically endangered and endangered marine habitats 	<p>No increase in threat status</p>	<p>High concern</p> 
Transformation of threatened ecosystems in coastal belt	<ul style="list-style-type: none"> Loss of 2000 ha of threatened ecosystem in the coast belt between 1990 and 2014 	<p>No loss of threatened ecosystems in the coastal belt</p>	<p>Declining</p> 
Buildings in high risk coastal areas	<ul style="list-style-type: none"> 40% increase in number of buildings in high risk coastal zone between 2006 and 2013 	<p>No increase in number of buildings in high risk coastal zones</p>	<p>Declining</p> 

Indicator	Key Quantifications	Target	Trend
HUMAN SETTLEMENTS: STABLE			
Housing	<ul style="list-style-type: none"> 16.6% of households in informal dwellings (18.2% in 2011) Housing backlog: 529 181 (409 827 in 2011) 	<p>Increasing % of population with access to formal housing</p> <p>Shift from providing houses to providing sustainable human settlements</p> <p>Shift from State as provider to State as enabler of housing provision</p>	<p>Declining</p> 
Access to basic services	<ul style="list-style-type: none"> Piped water: 96.5% in 2016 (99.1% in 2011) Electricity: 96.5% in 2016 (93.6% in 2011) Sanitation: 94.6% in 2016 (90.5% in 2011) Refuse removal: increased from 91.7% in 2011 – exact % not available 	Basic services to all households	<p>Improving</p> 
Access to transportation	<ul style="list-style-type: none"> Better transport infrastructure than much of SA Cost constraints and dearth of bus routes persist Some still walking long distances Poor transport service for low-income communities in rural areas 	Access to affordable public transport for all communities	<p>No change</p> 
Open space provision	<ul style="list-style-type: none"> Challenges to open space provision Lack of updated data on existing open space status 	Access to open spaces for urban and rural population	<p>Insufficient data</p> 
AIR QUALITY: STABLE WITH SLIGHT IMPROVEMENT			
Atmospheric pollutants	<ul style="list-style-type: none"> Particulate Matter (PM10) – below SA NAAQS and indicates a steady decline. 	Comply with the NAAQS, with steadily declining emission rates and ambient concentrations across the province.	<p>Improving</p> 
	<ul style="list-style-type: none"> Nitrogen Dioxides (NO2) – below SA NAAQS; however no visible trend Sulphur dioxide (SO2) – below SA NAAQS with key hotspot areas. Greenhouse gases (GHG) – increase in levels but stable per capita. 		<p>No change</p> 
Air Quality Management at District Level	<ul style="list-style-type: none"> Increased commitment to air quality related matters – complaints registers, AQMP updates, AQ Forums, By-Laws, Air Quality Officer appointments); and Increased number of monitoring stations. 	Continual commitment to air quality issues in the Province	<p>Improving</p> 
Key atmospheric pollutants per district	<ul style="list-style-type: none"> City of Cape Town: improving All other districts: No change 		<p>No change</p> 

Indicator	Key Quantifications	Target	Trend
CLIMATE CHANGE: DECLINING			
Projected changes to climate variables	<ul style="list-style-type: none"> Rising (minimum and maximum) temperatures Reduction in rain days; increasing intensity of rainfall events. Winter rainfall season starting later each year Sea level rise aligned with global trends 	Under 2°C increase in regional temperatures	Declining 
Extreme weather events	<ul style="list-style-type: none"> Increasingly frequent floods and droughts Increased fire incidence, extent and severity More sectoral policy responses to climate change related extreme weather events 	Limit/mitigate the change in impact, frequency and intensity of extreme weather events	Declining 
Emissions profile	<ul style="list-style-type: none"> Marginal increase in absolute GHG emissions and GHG emissions per GDP GHG emissions per capita unchanged 	2 metric tons of CO ₂ -equivalent per capita by 2050	No change 
ENERGY: STABLE			
Energy supply	<ul style="list-style-type: none"> Increasing number and diversity of power plants. More renewable energy Small scale embedded generation in 15 municipalities 	Increased energy generation from renewable sources Decreased dependence on coal	Improving 
Energy use	<ul style="list-style-type: none"> Total energy use increased by ~ 8% between 2013 and 2016 54% used by transport (35% in 2004 and 52% in 2009) Mostly coal based electricity and liquid fuels CCT consumes 57% (59% in 2013), West Coast 21% (20% in 2013) 	Decrease in energy use Decreased reliance on coal based electricity and liquid fuels	Declining 
Energy intensity	<ul style="list-style-type: none"> 48 GJ/capita energy consumption (increase from 46 GJ/capita in 2013) 6t CO₂e/capita (no change from 2013) Increase in intensity per unit of GDP 	Decrease in GJ/capita energy consumption Decrease in tonnes of CO ₂ e /capita Decrease in energy intensity per GDP	Declining 
Domestic energy use	<ul style="list-style-type: none"> 97.18% Households electrified (up from 93.4% in 2011) Decreasing % of households using electricity (rather than solar PV) for heating 	100% of households electrified Increase in households using solar PV Fewer households using biomass	Improving 
Energy security	<ul style="list-style-type: none"> 6.82% of households reporting interruption to electricity supply 30% of which lasted longer than 12 hours 	Fewer power outages Decrease in duration of interruptions Decreased reliance on Eskom for electricity	Insufficient historical data 

Indicator	Key Quantifications	Target	Trend
WASTE MANAGEMENT: CONCERN			
Waste generation	<ul style="list-style-type: none"> % increase in waste generated far exceeded population and economic growth rate. 	Waste generation rates in line with, or below population and economic growth rates.	Declining 
	<ul style="list-style-type: none"> Implementation of alternative waste management projects has improved waste diversion rates. 		Improving 
Waste characterisation	<ul style="list-style-type: none"> IPWIS implementation allows for improved reporting of waste generation rates. Low reporting compliance in many municipalities hinders understanding of waste streams. 	Reliable data regarding waste (general and hazardous).	Improving 
Waste management facilities	<ul style="list-style-type: none"> Fewer operational WMFs in 2017 vs 2006. Closure of unlicensed facilities and consolidation of existing operational facilities. All municipalities except CKDM have plans for regional facilities. 	Sufficient integrated waste management infrastructure to deal with projected waste volumes. Increase in compliance of WMFs.	Improving 
	<ul style="list-style-type: none"> Majority of the WMFs have less than 5 years of operational capacity remaining. 11% of WMFs require small changes to operation and management 27% of WMFs partially compliant, requiring improvements 61% had poor compliance, requiring major improvements. 		Concern 
Waste collection services	<ul style="list-style-type: none"> Increased % of households receiving weekly municipal waste removal services Room for improvement in rural areas 	Waste collection services for all communities.	Improving 

The Western Cape Province is committed to exploiting opportunities of the global Green Economy in order to ensure responsible, equitable and sustainable economic development. The aim is to reduce the environmental footprint of the province and improve the socio-economic circumstances of its citizens through a shift towards a more sustainable and eco- friendly Green Economy.

State of Environment reporting is to become a regular reporting tool for tracking resource utilisation trends. However, large scale conservation or environmental management interventions will not on their own shift consumption patterns in the province. It is our actions, our services, our consumption patterns which influence trends. Routine private, business and government decisions and activities will cumulatively change how we use or abuse our environment and the change needs to start with each of us today.

So let us start making a change today while we still can. Better Together.

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