State of Environment Outlook Report
for the Western Cape Province

Land

February 2018
# TABLE OF CONTENTS

1 INTRODUCTION ____________________________________ ________________________________ 1

2 DRIVERS AND PRESSURES __________________________ ________________________________ 1

2.1 Urban growth __________________________________ _______________________________ 3

2.2 Agricultural expansion ________________________ _________________________________ 3

2.3 Climate change ________________________________ _______________________________ 5

2.4 Access to land ________________________________ ________________________________ 6

2.5 Mining ________________________________________ ________________________________ 7

2.6 Improved farming methods ______________________ ______________________________ 8

3 STATE ___________________________________________ ___________________________________ 9

3.1 Land cover ____________________________________ ________________________________ 9

3.2 Land capability _______________________________ _______________________________ 11

3.1 Land transformation ___________________________ _______________________________ 15

4 IMPACTS__________________________________________ ________________________________ 15

4.1 Loss of productive land _______________________ ________________________________ 15

4.2 Loss of future socio-economic opportunities and livelihoods _____________________ 16

4.3 Improved standard of living and livelihoods ___ _________________________________ 17

4.4 Reduced natural ecosystems, species and ecological processes ________________ 17

5 RESPONSES _______________________________________ ________________________________ 18

5.1 Mitigation and adaptation _____________________ _______________________________ 18

5.1.1 Food security and sustainable agriculture _________________ 18

5.1.2 LandCare Programme __________________________ ____________________________ 19

5.1.3 Conservation agriculture ____________________ ________________________________ 20

5.2 Policy, tools and legislation _________________ ___________________________________ 21

5.2.1 Spatial Planning and Land Use Management Act _________________ 21

5.2.2 Urban Edge Policies _________________________ _______________________________ 21

5.2.3 Western Cape Biodiversity Framework, Biodiversity Sector and Bioregional Plans 21

5.2.4 The South Africa Land Reform Programme __________________________________ 22

6 CONCLUSION ______________________________________ _______________________________ 22

7 REFERENCES ______________________________________ ________________________________ 24
TABLE OF FIGURES

Figure 2-1: Population growth in the Western Cape Districts between 2011 and 2016 2
Figure 2-2: Restitution claims settled in the Western Cape, 1995–2015 6
Figure 2-3: Location of mineral resources in the Western Cape 7
Figure 3-1: Summarised land cover for the Western Cape 10
Figure 3-2: Land cover percentage data comparison: 2009 and 2013/14 11
Figure 3-3: Land capability classes within the Western Cape (excluding already transformed and degraded areas) 13
Figure 3-4: Land transformation in the Western Cape 14

LIST OF TABLES

Table 3-2: Land cover change in the Western Cape 15
Table 6-1: Overview of key land aspects 22
Table 6-2: Summary of the outlook for land in the Western Cape 23

ANNEXURES

Annexure A Summary of policy, tools and legislation
# Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACDI</td>
<td>African Climate and Development Initiative</td>
</tr>
<tr>
<td>ARC</td>
<td>Agricultural Research Council</td>
</tr>
<tr>
<td>CA</td>
<td>Conservation Agriculture</td>
</tr>
<tr>
<td>CCT</td>
<td>City of Cape Town</td>
</tr>
<tr>
<td>CRLR</td>
<td>Commission for Restitution of Land Rights</td>
</tr>
<tr>
<td>CSIR</td>
<td>Council for Scientific and Industrial Research</td>
</tr>
<tr>
<td>DEAT</td>
<td>Department of Environmental Affairs and Tourism</td>
</tr>
<tr>
<td>DMR</td>
<td>Department of Mineral Resources</td>
</tr>
<tr>
<td>DRDLR</td>
<td>Department of Rural Development and Land Reform</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GDPR</td>
<td>Gross Domestic Product per Region</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gas(es)</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information Systems</td>
</tr>
<tr>
<td>LUPA</td>
<td>Land Use Planning Act 3 of 2014</td>
</tr>
<tr>
<td>NAP</td>
<td>National Action Programme</td>
</tr>
<tr>
<td>PERO</td>
<td>Provincial Economic Review and Outlook</td>
</tr>
<tr>
<td>PSDF</td>
<td>Provincial Spatial Development Framework</td>
</tr>
<tr>
<td>PV</td>
<td>Photovoltaic</td>
</tr>
<tr>
<td>SANBI</td>
<td>South African National Biodiversity Institute</td>
</tr>
<tr>
<td>SDF</td>
<td>Spatial Development Framework</td>
</tr>
<tr>
<td>SEA</td>
<td>Strategic Environmental Assessment</td>
</tr>
<tr>
<td>SoEOR</td>
<td>State of the Environment Outlook Report</td>
</tr>
<tr>
<td>SPLUMA</td>
<td>Spatial Planning and Land Use Management Act 16 of 2013</td>
</tr>
<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
</tr>
<tr>
<td>WC</td>
<td>Western Cape</td>
</tr>
<tr>
<td>WCCCRS</td>
<td>Western Cape Climate Change Response Strategy</td>
</tr>
<tr>
<td>WCG</td>
<td>Western Cape Government</td>
</tr>
<tr>
<td>WFP</td>
<td>World Food Programme</td>
</tr>
<tr>
<td>WWF</td>
<td>World Wide Fund for Nature</td>
</tr>
<tr>
<td><strong>GLOSSARY</strong></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Agrochemical</strong></td>
<td>A chemical used in agriculture, such as a pesticide or a fertilizer.</td>
</tr>
<tr>
<td><strong>Biodiversity</strong></td>
<td>The variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part. The term also includes diversity within species, between species, and of ecosystems.</td>
</tr>
<tr>
<td><strong>Carrying capacity</strong></td>
<td>The maximum population of a given organism that a particular environment can sustain.</td>
</tr>
<tr>
<td><strong>Climate Change</strong></td>
<td>A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use. According to the Intergovernmental Panel on Climate Change (IPCC), climate change refers to any change in climate over time, whether due to natural variability or as a result of anthropogenic activities. Note that the Framework Convention on Climate Change (UNFCCC) differs in that it defines climate change as in addition to natural climate variability, i.e. “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods”. The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes.</td>
</tr>
<tr>
<td><strong>Conservation</strong></td>
<td>The maintenance of environmental quality and functioning.</td>
</tr>
<tr>
<td><strong>Conservation Agriculture</strong></td>
<td>Conservation agriculture aims to achieve sustainable and profitable agriculture and subsequently aims at improved livelihoods through the application of the three conservation agriculture principles: minimal soil disturbance, permanent soil cover and crop rotations. Conservation agriculture is an agricultural production approach that contributes to the goal of sustainable agriculture.</td>
</tr>
<tr>
<td><strong>Consumption</strong></td>
<td>The purchase and/or use of goods and services.</td>
</tr>
<tr>
<td><strong>Degradation</strong></td>
<td>The reduction or loss of the biological or ecological productivity of an area (see Desertification).</td>
</tr>
<tr>
<td><strong>Desertification</strong></td>
<td>The degradation of land in arid, semi-arid, and dry sub-humid areas, resulting from various factors including climatic variations and human activities.</td>
</tr>
<tr>
<td><strong>Development</strong></td>
<td>A process of change that represents planned progress of some kind. For example, developing the economy of a region or country can take place through the expansion of economic activities, the improvement of people’s skills, or job creation.</td>
</tr>
</tbody>
</table>
| **Drivers** | These are the primary agents driving change in the environment, and may be human induced or natural. They include the underlying socio-economic and political agents of change, such as population growth and the desire for increased consumption. Drivers can also be described as ‘wants’. Some indirect drivers such as governance structures, socio-cultural perceptions, population demographics and technological dependence can also be included. Driving forces emanating from natural processes (e.g. solar cycles) are possible, but are typically too infrequent, not well understood or
operate over timescales that are easily related to the 4-yearly reporting framework of the State of Environment Report.

**Ecological footprint**
A measure of the 'load' imposed by a given population on nature. It represents the land area of average quality needed to sustain current levels of resource consumption and waste discharge by that population. The bigger the footprint the greater is the impact that it represents.

**Ecosystem**
A dynamic system of plant, animal (including humans), micro-organism communities, and their non-living physical environment interacting as a functional unit. The basic structural unit of the biosphere, ecosystems are characterised by interdependent interaction between the component species and their physical surroundings. Each ecosystem occupies a space in which macro-scale conditions and interactions are relatively homogenous.

**Ecosystem services**
Ecological processes or functions having monetary or non-monetary value to individuals or society. These are frequently classified as (i) supporting services such as productivity or biodiversity maintenance, (ii) provisioning services such as food, fibre, or fish, (iii) regulating services such as climate regulation or carbon sequestration, and (iv) cultural services such as tourism or spiritual and aesthetic appreciation.

**Environment**
In terms of NEMA “Environment” means the surroundings within which humans exist and that are made up of: (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) an part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

**Environmental degradation**
The reduction of the capacity of the environment to meet social and ecological objectives and needs.

**Environmental health**
Well-being based on the health of the environment, both natural and built.

**Food security**
A state that prevails when people have secure access to sufficient amounts of safe and nutritious food for normal growth, development, and an active and healthy life.

**Forestry**
The practice of growing and managing forest trees for commercial timber production. It includes the management of specifically planted forests and of native or exotic tree species, as well as the commercial use of existing indigenous forests.

**Fynbos**
Afrikaans word for ‘fine-leaved bush’; a biome in South Africa’s southern Cape area, comprising shrubs and shrubby woodland with patches of hardwood.

**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.

**Gross Domestic Product per Region**
A subnational gross domestic product for measuring the size of a region’s economy.

**Impacts**
‘Impacts’ describe the consequences of the good or bad state of elements of the environment for sustainability, specifically on humans, the economy, ecosystems, as well as other environmental systems, and could include regional or global effects. For example: high levels of indoor air pollution may result in respiratory tract infections; land degradation may lead to decreased food production, increased food imports, increased fertilizer use, malnutrition and siltation of aquatic systems. The impacts should be seen as changes that are occurring within environmental, economic or social systems and their ability to perform functions or services
Indicator
A measure that helps to assess the extent of the success with which goals are being achieved. Based on complex information or data, indicators are often used in State of the Environment reports to measure how resources are being managed.

Land degradation
Reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rain-fed cropland, irrigated cropland, or range, pasture, forest and woodlands, as a result of land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns such as: (i) Soil erosion caused by wind and/or water; (ii) Deterioration of the physical, chemical and biological or economic properties of soil; and, (iii) Long-term loss of natural vegetation (see Soil degradation).

Land reform
Redistribution of land to recognize the rights of all citizens.

Land transformation
The conversion of land, normally from natural habitat to human uses such as agriculture or settlements.

Migration
Movement of all or part of a population to and from a geographical area. The movement may be temporary or permanent.

Non-renewable resources
Resources that do not renew themselves in a human time-scale and cannot be replenished once exhausted, such as fossil fuels and copper.

Pollution
The accumulation of harmful or poisonous substances in the environment that leads to environmental degradation.

Population growth
An increase in the number of organisms or species. In human demography, the population growth rate refers to the annual growth rate of the population calculated from mid-year.

Poverty
A certain level of material deprivation below which a person suffers physically, emotionally, and socially.

Pressures
The human activities and processes that act on the environment and cause environmental change. They are distinct from the driving forces since they relate directly to the use and exploitation of natural resources, as opposed to the driving forces, which determine the scope or extent of the pressures. Effectively, the pressures satisfy the ‘wants’ or driving forces. Pressures can be divided into three main types: (i) excessive use of environmental resources; (ii) changes in land use; and, (iii) emissions (of chemicals, waste, radiation, noise) to air, water and soil.

Resilience
The capacity of a social-ecological system to cope with a hazardous event or disturbance, responding or reorganizing in ways that maintain its essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation.

Response
The societal actions taken collectively or individually to ease or prevent negative environmental impacts, correct damage or conserve natural resources can be seen as ‘responses’. Responses may include policy and regulatory action, environmental or research expenditures, public opinion and consumer preferences, changes in management strategies and the provision of environmental information.

Smallholder farmer
Smallholder farmers are defined as those farmers that produce more product than their own requirements and sell excess, either directly to consumers or supply products to collection centres or co-operatives, which generally process and market the products. Within the smallholder sector, farmers will fluctuate between subsistence and commercial, depending on numerous factors.
Soil degradation: The declining productivity of soils through physical, chemical, or biological deterioration resulting from a combination of physical factors such as drought, management factors such as cultivation of marginal land or overstocking, and historical and socio-economic factors such as inequitable distribution of land (see Land degradation).

Soil erosion: The loss or movement of soil by agents such as running water, wind, and gravity.

State: The ‘State’ describes the actual condition of the environment resulting from the pressures. For example, air quality in terms of the level of air pollution, and proportion of degraded area of land. The ‘State’ is described in terms of both current state and trends over time. A study of environmental trends will reveal whether the state of the environment is getting better or worse. It also gives an indication of how quickly changes are happening (the rate of change) and whether rates of change are increasing or decreasing.

Sustainable agriculture: Agriculture that does not degrade the soil or other resources on which it depends.

Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
1 INTRODUCTION

The 2006 South African National State of the Environment Report, refers to land as “the terrestrial bio productive system that comprises soil, vegetation, other biota, and the ecological and hydrological processes that operate within the system” (DEAT, 2006). Globally, land resources are under constant pressure from social, political and environmental drivers. This is particularly true in the Western Cape and South Africa, where population growth, urbanisation, urban sprawl and poverty all compound existing spatial constraints. Much of this can be attributed to poor land use planning ascribable to the legacy of past segregated, inequitable land use and rights in South Africa.

After the Northern Cape, Eastern Cape and Free State Provinces, the Western Cape is the fourth largest province in South Africa. At 129 462 km$^2$, it comprises 10.6% of the country’s total land surface area (WCG, 2013a) and has contrasting landscapes consisting of large fold mountains, plains and farmland, developed and natural coastlines and semi-desert conditions further inland. In addition to City of Cape Town (CCT), there are five district municipalities, namely; West Coast, Cape Winelands, Overberg, Eden and Central Karoo District Municipalities.

The primary land uses in the province are urban residential, commercial, agricultural (including cultivated areas, grazing vineyards and plantations) and industrial. Most of the larger urban areas are located close to the coast and near agricultural resources. Inland, where land is generally less productive, settlements are typically smaller and more isolated.

The key landscape (types) in the Western Cape include (WCG, 2013a):

- A long, high-energy, scenic coastline;
- Fertile coastal plains (the West Coast, Agulhas Plain and Southern Cape);
- A spine of mountains (Franschhoekberg, Witzenberg, Cederberg, Riviersonderend, Langkloof, Outeniqua and Swartberg Mountains, with incised river valleys such as the Bitou, Hex, and Breede Valleys and Gamkaskloof);
- A series of inland plains (the Tankwa Karoo, Little Karoo and Great Karoo);
- A second range of mountains in the interior (the Bokkeveld, Roggeveld and Nuweveld Mountains); and
- Great plains extending into the Northern Cape Province.

The land chapter in the Western Cape State of the Environment Outlook Report (SoEOR) records the state of land use in the Western Cape, including spatial patterns (both anthropogenic and bio-physical), access to land as a resource as well as other interacting, dynamic systems and drivers which shape current land use and value. This chapter also identifies the pressures and impacts on land in the province, measured by three key indicators (land cover, land capability and land transformation) and the potential responses to address impacts.

2 DRIVERS AND PRESSURES

There are four main drivers of land change in the Western Cape, namely:

- Population increase (specifically along urban coastal areas, but also rural areas);
- Investment and increased demand for commodities resulting in urban, agricultural, and infrastructural expansion, and more mining;
- Incompatible development in and close to environmentally sensitive areas; and
- Inappropriate land use management practices.

The Western Cape population grew by almost half a million between 2011 and 2016, and is currently estimated at 6.51 million people (StatsSA, 2017). Given declining fertility rates, net in-migration remains a significant driver of population growth in the province. The average population growth between 2011 and 2016 across districts in the Western Cape is depicted in Figure 2-1 below.

![Population growth in the Western Cape Districts between 2011 and 2016](image)

**Figure 2-1: Population growth in the Western Cape Districts between 2011 and 2016**

*Source: StatsSA CS, 2016*

From a land perspective, it is important to note that 64% of the total population resides in the CCT (WCG, 2017a). This exerts intense pressure on the finite land resources in the city, specifically as regards informal settlements, since the carrying capacity of land in the CCT can only sustain a limited number of resource users. Urban expansion, encroachment by agriculture into natural habitats and increased demand for ecosystem goods and services all contribute to significant habitat destruction in the Western Cape. This also has repercussions on the scenic and aesthetic value of the province, exacerbated by increasing soil erosion in the province. As such, habitat destruction is the greatest threat to the Western Cape’s biodiversity.

The economic outlook for the Western Cape is poor which, coupled with poverty, unemployment and inequality, will continue to put pressure on the provincial land resource (Donnelly, 2017). While mining is not a huge economic contributor in the province, the demand for land as a commodity continues to drive environmental change. This is particularly true for the development of human settlements, supply of basic services, agriculture and agri-processing, all of which are land intensive.

Demand for (suitable) land often exceeds “supply” and in many instances, sensitive land is jeopardised and impacted by inappropriate land use, e.g. intensive agricultural activities in the threatened Renosterveld and human settlements perching on mountainsides (e.g. Imizamo...
The implementation of land reform policies has an observable effect on land use change in the Western Cape. A major national political goal was to transfer 30% of agricultural land to black South Africans by 2014. By the end of 2004, 3.5 million hectares comprising only 4.3% of commercial agricultural land had been transferred, by restitution, redistribution, and tenure reform (Gibson et al., 2005). Land restitution (one of the components of land reform) entails returning land or providing compensation to those who were dispossessed by the 1913 Land Act. Approximately 17 000 claims were lodged in the Western Cape and restitution in the Western Cape peaked in 2007 with an accumulative total of approximately 15 500 claims settled. A further 286 cases were settled (DRDLR, 2013) between 2008 and 2012 and it is evident that land reform in the Western Cape has granted an increasing number of previously disadvantaged groups access to land. Unfortunately, the lack of financial and technical support for beneficiaries of the land reform programme is leading to observable land change as the land use is invariably changed by the beneficiaries.

Critically, land use management is the primary means of sustaining or – in its absence - degrading land in the province. Without suitable land use management, effects on ecosystems and the economy can be significant. The overuse and misuse of land in the province is a growing concern, with degradation increasing markedly since 2013. The pressures these drivers contribute to are detailed in the subsections below.

2.1 Urban growth

Urbanisation is a global challenge and the Western Cape is no exception, and the province’s rapidly growing population and elevated urbanisation rate (second only to Gauteng) places strain on land resources (WCG, 2016b). Migration and urbanisation are driven by real or perceived employment opportunities and better access to services. Between 2011 and 2016 alone, about 290 000 people migrated to the Western Cape, while population growth rates at district level are substantial despite a relatively low provincial fertility rate (WCG, 2017). Significant increases in intra-provincial migration from interior urban centres to coastal urban nodes (particularly the CCT) are also evident, with diminished economic prospects in the interior prompting the trend.

In-migration in concert with the land-intensive nature of much economic activity (manufacturing and agriculture) continuously increase the burden on land resources in the province. Intense demand has transformed land for human settlements and service provision, even though some of this land is better suited to agriculture and ecological processes (conservation). This is particularly true of coastal urban nodes in the province, such as the CCT and Saldanha Bay, where human settlements are continually expanding to cater for the growing population.

2.2 Agricultural expansion

The Western Cape is the largest contributor to South African agricultural exports (45% by value) (GreenCape, 2016) and contributes an estimated 23.3% to the national Agricultural, Forestry and Fishing sector, representing over 4% of total Gross Domestic Product per Region (GDPR) of the province (WCG, 2014b). Agriculture utilises an estimated 89% of the total arable land\(^1\) in the province (70% grazing, 16% dryland agriculture and the rest irrigated).

---

\(^1\) GreenCape defines arable land as land under temporary crops, temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded.
Agriculture is a very important employer, providing jobs for 150,000 people across the province. Districts where agriculture is an important employer include (WCG, 2016b):

- Cape Winelands (21%),
- West Coast (24.3%); and
- Overberg (18.7%).

The agriculture sector in the Western Cape is growing and, as a resource-intensive sector, the pressure it places on land is notable and it is deemed that most of the land under cultivation in the Western Cape is not suited to agriculture\(^2\). A decrease in the number of farms and an increase in farm size is particularly evident in the fruit sector, where 30% of the farmers produce as much as 80% of the fruit (Hortgro, 2015). Smallholder farmers are unable to compete and developing an inclusive rural economy remains challenging.

Almost no suitable land is available for extension of the province’s agricultural footprint, and water scarcity limits the use of arable land. Some farming practices are ineffective and inefficient, impinging on agricultural productivity and contributing to the loss of topsoil. Many standard farming methods and practices are unsustainable, largely due to negative impacts on the natural environment. Unsound practices include use of chemical pesticides (which causes water pollution and reduces biodiversity), tillage (a leading cause of soil degradation) and burning of fossil fuels to power farm equipment and infrastructure (which contributes to air pollution and carbon dioxide emissions) (GreenCape, 2016).

An estimated 15.1% of the total surface area of the province has been transformed by (as opposed to used for) agriculture (GeoTerra Image, 2013/14) primarily clustered round three agricultural nodes: the West Coast, the eastern portion of the Overberg and the Langkloof (WCG, 2014b) – see Figure 3-2.

Although agriculture has a significant and not always positive effect on the natural environment, farming practices per se mainly determine the impact agriculture has on the natural environment (Vink, 2003). As population increases so does the imperative to produce food and it is difficult to weigh the systematic destruction of the environment against the human need for fibre and food. In addition, much of South Africa’s agricultural export production is dominated by the province which provides high-value products such as wine grapes and fruit, but also require land. Export markets are a key driver of sustainable agricultural practices, as international regulations and protocols require more environmentally friendly practices and reduced carbon emissions (GreenCape, 2017). Consumers are also starting to exert similar pressure. In response, a number of Biodiversity Initiatives have emerged in the Western Cape. The initiatives aim to put production on a more sustainable footing by conserving agricultural resources such as soil, energy and water in recognition that production landscapes are

---

\(^2\) This observation is based on the Land Capability datasets used in the northern, summer rainfall areas where soils and practices are quite different from parts of the Western Cape. One of the main issues with the datasets used to measure Land Capability is that the classification methodology demotes many of the cultivated areas in the Western Cape Province to “non-arable” classes based mainly on their shallow soil depth without acknowledging that field crops are grown during winter in the Western Cape when evapotranspiration is much lower. Conversely, the areas shown as higher classes adjacent to the west coast (e.g. Sandveld) are actually not high potential, as the soils are sandy and inherent unfertile.
dependent on biodiversity for the ecosystem services they provide (SANBI, 2017). Such initiatives include the actions of Greencape, the SmartAgri plan of DoA, the GreenAgri portal (co-hosted by DoA and GreenCape), the Biodiversity in Wine Initiative (BWI) and the Sustainable Fruit Initiative to name but a few.

2.3 Climate change

The Western Cape is considered to be highly vulnerable to the impacts of climate change, most notably increased temperatures and flooding. These climate-related hazards pose a substantial risk to the Western Cape’s economy, population and ecosystems. A long-term reduction in rainfall with an increase in extreme events and drought conditions is projected (WCG, 2014a). This suggests that the province needs to be moving towards land use practices that are resilient to these impacts. Without this, climate change will continue to put pressure on land resources, which will become more susceptible to erosion and other forms of land degradation.

For the Western Cape, temperatures are projected to rise and a long term decrease in rainfall is projected, as discussed in the Climate Change Chapter. The timing of the first rains will affect small grain planting, while reduced rainfall will lower the moisture content and composition of soils, which will be less suitable for (dryland) cultivation of a number of crops.

**Case study: Grabouw and Elgin Apples**

Apples are one of the most sensitive irrigated crops, particularly when it comes to temperature. Apples require “chilling units”, whereby trees sense the drop in temperature in autumn and “come to rest” for winter. This is an important part of the trees’ annual cycle, as they need periods when they don’t grow. If trees do not detect the chilling unit, they will flower incorrectly, not necessarily in spring, when the tree is supposed to start flowering and bearing fruit. Fruit will be of poor quality and the overall harvest will reduce.

This is a troubling consequence of climate change in the Grabouw and Elgin valley, where the temperatures are already warmer than in most apple producing regions. As the temperature continues to increase in the Western Cape, so too apple farmers will struggle to maintain the required yields and quality, unless more temperature-resistant, New World (cost-intensive) cultivars are planted. As such, the sector is struggling to adapt to the changing temperatures, affecting their competitiveness in global markets. Colder parts of the valleys, such as the Koue Bokkeveld are unlikely to feel the effects of climate change soon.

Food production and food security could be significantly impacted by climate change. Predictions from the scientific community together with farming communities’ first-hand experience suggest that the resilience of the agricultural sector in the Western Cape will be highly compromised due to climate change (SmartAgri, 2016).
Without adaptation or mitigation, this pressure will have significant consequences, such as increased poverty and food insecurity, and the emergence of climate refugees which will all affect land use and trigger land use change in the province.

2.4 Access to land

A legacy of spatial segregation and displacement has led to an unequal distribution of the Western Capes’ land resources. With this has come the entrenchment of unsustainable land practices, which have contributed significantly to the degradation of land in the province (WCG, 2013a). This is particularly true of the urban fringe and agricultural and rural areas, where growing informal settlements, without access to basic services or knowledge systems, are highly dependent on ecosystem services (e.g. for water, waste disposal, firewood). The State’s solution to unequal access to land is land restitution and reform; however, the roll out of the process is slow and complex. Between 1994 and 2012, 131 439 people benefited from successful land restitution claims (for 4 178 hectares) in the Western Cape (Figure 2-2). The land area awarded was small because most restitution was in urban areas and, as such, poor land use management in rural, agricultural areas remains a concern (CRLR, 2015).

Since the adoption in June 2014 of the Restitution of Land Rights Act 22 of 1994, 194 land claims have been settled in the Western Cape (Figure 2-2), including the largest land claim to date in the Western Cape. The Ebenhaeser community (dispossessed of properties in the West Coast area in 1925) was awarded 44 farms on the banks of the Orange River in a R350 million claim. A seven-year process secured the support of 22 of the 44 farmers and the approval of 1 566 ha of privately owned commercial land and 1 919 hectares of state-owned land. The community, in partnership with the Department of Rural Development and Land Reform (DRDLR), provincial agriculture and housing departments, organised agriculture (current landowners) as well as the Matzikama Local Municipality, will now work towards sustainable agricultural growth and integration of those previously dispossessed (CRLR, 2015).

![Figure 2-2: Restitution claims settled in the Western Cape, 1995-2015](source: CRLR, 2015)
2.5 Mining

Mining in the Western Cape is comparatively small compared to the rest of the country. However, notable mineral deposits along the West Coast ensure its role as a pressure on land. Limestone, dolomite, heavy mineral sands, sand, salt, and diamonds are mined or quarried in the province (WCG, 2013a). The extraction of construction materials in close proximity to infrastructure and in sensitive environments is considered inevitable and necessary to promote economic growth in the province (WCG, 2013a). As such, sand mines are proliferating in the West Coast, and illegal sand mining is also prevalent.

While current mining activities remain largely restricted to the West Coast, future mining activities are likely to increase, particularly shale gas exploration (and production) in the central Karoo and offshore oil and gas exploitation on the West Coast and South Coast. Mining compromises sense of place, natural landscapes, and ecosystem services and it is evident that trade-offs for the limited land resources in the province are required to support economic activity while maintaining ecosystems and sustainable social structures (CCT, 2015).

Mining, while good for economic diversification, has consequences in habitat loss, land transformation, and water pollution. Mineral resources occur throughout the province (as seen in Figure 2-3) and as such, future mineral extraction is likely (and supported by Department of Mineral Resources - DMR). Possible shale gas extraction in the Karoo is particularly contentious but likely, as the national DMR has recently given exploration the go ahead, and the Minister of Mineral Resources may award the first shale gas exploration licences by late 2017 (Roelf, 2017).

Figure 2-3: Location of mineral resources in the Western Cape

Source: Council for Geoscience, 2013
2.6 Improved farming methods

A range of influences has encouraged a transition to sustainable agriculture in both South Africa and the Western Cape. In the Western Cape, these include water scarcity and climate change, decreasing soil condition, the high cost of energy and an ever-increasing food demand (GreenCape, 2016). This, coupled with new consumer awareness of declining nutritional value in food, pesticide residues, ecosystem degradation and pollution have prompted positive land management responses in the Western Cape.

Climate change effects, particularly water scarcity in the Western Cape, is fast becoming a leading pressure to move to green, sustainable farming methods. This movement seeks to encourage the adoption of technologies and practices that have lower water consumption and actively improve the soil health, promote retention of water and improve yields in water stressed conditions (ARC, 2014). The consensus amongst farmers is that while the sector contributes a relatively small amount to greenhouse gas emissions (GHGs), it is the sector most directly affected by climate change impacts. Decreased rainfall and warming is evident, e.g. in the Swartland region, one of the largest grain producing regions in the country (GreenCape, 2016). Productivity in the Swartland has declined notably, adversely affecting local communities and rural economy (GreenCape, 2016). A drive toward promoting climate smart intensification of winter grain production while improving soil health in the Western Cape is an example of how this is being addressed in the province (ARC, 2014).

Droughts and/or prolonged dry spells often result in severe crop damage or complete crop failures. It is then apparent that urgent measures must be taken to boost productivity in a sustainable manner. Projects such as Conservation Agriculture in the Western Cape focus on such measures (see Section 5.1.2), including, for example, initiatives to increase resilience to drought-induced moisture stress.

Traditional (commercial) farming methods have been recognised as unsustainable because of their far-reaching effects on human and environmental health. Government, farmers and researchers are introducing sustainable farming methods (moving away from agrochemicals, tillage and fossil fuels) across the province (ARC, 2014). Other measures include the eradication of alien invasive plants and their replacement with indigenous vegetation, restoration of wetlands and other natural buffer zones (WCG, 2013b).

Market pressures have also resulted in improved farming methods. Rising costs (e.g. fertiliser, energy and water), population growth, limited availability of arable land and power outages all affect the competitiveness of the agricultural sector (GreenCape, 2016). Resource-constrained farmers have little choice but to seek innovative farming methods that ensure they remain competitive and meet the country’s own food requirements.
3 STATE

The state of land in the Western Cape is ascertained by measuring the condition of the three land indicators and determining how they have changed over time. Ultimately, how land is managed and used determines its underlying state. As was the case in the 2013 SoEOR, land capability and transformation data has not been sufficiently updated to detect trends.

3.1 Land cover

Changes in land use and land cover have substantial impacts on the environment and biodiversity. Land cover in the Western Cape is still mostly classified as natural\(^3\) (65.2%), with most urbanisation and anthropogenic activities occurring along the coast (Figure 3-2). Agricultural and cultivated land (15.1%) is most prevalent on the coastal plains unlike the arid interior of the province. Plantations (0.6%) are found near the coast, most particularly in the Eden District. Urban areas mostly in the CCT account for 0.9%, although pockets of urban development (e.g. Knysna and Plettenberg Bay) are located in coastal areas. Exceptions are Stellenbosch, George and Beaufort West, urban nodes located in the interior of the province (SoEOR, 2013; GeoTerra Image, 2013/14).

Figure 3-1 shows patterns of land cover derived from the most recent land cover layer for South Africa (GeoTerra Image, 2013/14). A substantial percentage (33.5%) of the Western Cape’s land cover is transformed. Growing pockets of sheet and gully erosion are visible over the central Western Cape, while land degraded by mining is also visible along parts of the West Coast. Improvements are seen in (control of) alien invasive vegetation across the province. However, there are still prominent encroachments near human-settlements.

Trends in land cover change are difficult to assess due to the dearth of data or other limitations. The available data layers 1994/5, 2001 (CSIR), 2009 (SANBI) and 2013/14 (GeoTerra Image) cannot be meaningfully compared, as there are discrepancies in the number and classification of land cover classes as well as the actual scale at which each data set is presented. As such, data is largely unusable.

Figure 3-2 would appear to indicate a significant increase in degraded land in the Western Cape. However, there were almost certainly discrepancies/inaccuracies in previous reporting and the scale at which the data sets are presented, and in reality, a more constant increase from 2009 to 2013/14 is plausible.

---

\(^3\) Natural land cover refers to indigenous forest, thicket/dense bush, woodland/wooded grassland, grassland, wetlands, shrubland (fynbos) and low shrubland.
Figure 3-1: Summarised land cover for the Western Cape
3.2 Land capability

Land capability is defined as the ability of the soil resource to effectively carry its respective land use (Schoeman et al., 2002). It is a valuable tool in land use planning, and indicates the best use for the land according to capability classes. Prior to 2016, land capability was classified into various classes ranging from I (land most suited to cultivation) to VIII, (least suited to cultivation). This land capability classification system was not considered adequate to inform decision making pertaining to the agricultural capability of land for purposes and a refined methodology was developed to evaluate land capability taking into consideration soil capability, climate and terrain, with categories ranging from 1 (very low capability) to 15 (very high capability). The resulting land capability across the Western Cape is depicted in Figure 3-3 below (DAFF, 2017).

Figure 3-3 illustrates that apart from coastal areas, certain areas in and around the CCT, and the inland areas west of Piketberg and Malmesbury, land capability in the Western Cape mostly falls between classes 1 and 7 (very low to low-moderate).

Opportunities for agricultural expansion in the Western Cape are limited, as much of the land in the province is unsuitable for cultivation (WWF, 2016) and further restricted by access to water for irrigation, particularly in the fruit sector. In fact, cultivation decreased by 3.5% between 2009 and 2014 (SANBI, 2009; GeoTerra Image, 2013/14). Care should be taken to ensure crops are planted in the appropriate soil (type) to ensure a sustainable carrying capacity. Here, the land capability indicator can be used to determine the optimal land use in the province, without compromising or further reducing the capability of the land resource (ARC, 2001).

Soils are in part a product of the underlying geology and rate of weathering, and vary across the Western Cape. Western Cape soil profiles, a key informant of land capability, are summarised below (SoEOR, 2009):

- Chemically weathered, deeper soil profiles are found in the wetter coastal areas of the province, while the dry interior soils have shallow, poorly formed soil profiles;

\[\text{Note that although descriptions for categories are provided on the figure, these are for illustrative purposes only and reference should be made to the numerical category.}\]
- The West Coast is dominated by soils that are created through wind erosion (i.e. windblown sands). These soils are incredibly susceptible to wind erosion, which is exacerbated by vegetation loss due to anthropogenic activities and desertification;
- Inland from this, soils are typically clay-based and derived from the weathering of Malmesbury shale substrates, as such making them perfect for winter wheat farming;
- The sandstone substrates of the Cape Fold Belt Complex, along with adjacent sand plans are nutrient poor and highly leached;
- High lying soils (600m and above) experience high winter rainfall, which results in acidic sands with high organic value;
- Colluvial slopes, which are deeper and underlain by shale or granite, are less acidic and nutrient rich;
- “Young” sands on the coastal margin are highly alkaline and best described as highly alkaline; and
- The soils typical of the Karoo landscape (mostly located in the Central Karoo) receive little rain and are incredibly thin, making them very unsuitable for agriculture aside from stock farming.
Figure 3-3: Land capability classes within the Western Cape (excluding already transformed and degraded areas)
Source: DAFF, 2017
Figure 3-4: Land transformation in the Western Cape

Legend
- **Towns**
- **WC District Municipalities Transformation (2013/2014)**
  - **Untransformed**
  - **Transformed**
3.1 Land transformation

Transformation is caused by agricultural activities, urban expansion and degradation and is largely driven by land use, and Figure 3-4 presents the distribution of transformed land based on 2013/2014 data (GeoTerra Image, 2013/14). There has been a reported substantial increase in land transformation (the conversion of land, normally from natural habitat to anthropogenic uses) between 2009 and 2014 in the Western Cape as represented in Table 3-2 also represented graphically in Figure 3-2. The Central Karoo remains the least transformed district in the province, with the CCT most transformed since 2009.

Table 3-2: Land cover change in the Western Cape

<table>
<thead>
<tr>
<th>Land cover</th>
<th>2009</th>
<th>2014</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivation</td>
<td>18.6%</td>
<td>15.1%</td>
<td>-3.5%</td>
</tr>
<tr>
<td>Degraded</td>
<td>0.6%</td>
<td>16.8%</td>
<td>+16.2%</td>
</tr>
<tr>
<td>Mines</td>
<td>0%</td>
<td>0.1%</td>
<td>+0.1%</td>
</tr>
<tr>
<td>Natural</td>
<td>78.2%</td>
<td>65.2%</td>
<td>-13.0%</td>
</tr>
<tr>
<td>Plantations</td>
<td>0.7%</td>
<td>0.6%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Urban built-up</td>
<td>1%</td>
<td>0.9%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Waterbodies</td>
<td>0.8%</td>
<td>1.3%</td>
<td>+0.5%</td>
</tr>
</tbody>
</table>

Source: SoEOR, 2013; GeoTerra Image, 2013/14

The Western Cape is still largely natural and untransformed (GeoTerra Image data suggests 65.2%), with the greatest instances of transformation focused in the CCT and other coastal nodes. Land degradation in the Western Cape has increased by 16.2% since 2009 (SANBI, 2009; GeoTerra Image, 2013/14), although other statistical data does not corroborate this. For example, urban areas do not appear to have grown significantly on the land cover map; however, StatsSA data suggests a substantial increase in urbanisation in the Western Cape, particularly in the CCT as well as informal settlements on the urban fringes of other urban areas. (The role of urbanisation in land transformation is further discussed in the Human Settlements chapter). As such, it is difficult to reconcile data from the 2009 SANBI layer and the 2013/14 GeoTerra Image layer. This data does nevertheless provide useful information and insight to guide land use management in the Western Cape.

4 IMPACTS

Taking into consideration the state of- and pressure on- land, this section discusses the impacts on the Western Cape environment.

4.1 Loss of productive land

Food security, employment, the economy and livelihoods are highly dependent on agriculture in the Western Cape, and the decrease in cultivated land cover is cause for concern. This, along with soil loss, will lead to the reduction of productive land if measures to protect the soils of the province are not implemented.

Increased siltation of dams has raised maintenance costs and reduced reservoir capacity, also threatening agricultural productivity (GreenCape, 2016). Furthermore, informal settlements inappropriately sited in sensitive and/or rural areas is increasing desertification, occasioned by poor services and infrastructure which fosters poor agricultural practices and unsustainable utilisation of ecosystem services.

Soil degradation and loss initiates a cycle which leads to extensive soil erosion in the Western Cape, which in turn causes vegetation degradation and loss, and subsequent wind and water
erosion. Critically, soil loss in the province is intrinsically linked to agricultural decline, with effects on rural communities and the regional and provincial economy.

Erosion is the single biggest threat to soil resources in the province, and is a result of numerous pressures, including climate change and poor land use practices. Soil type, land use and condition and weather patterns all contribute to the rate and extent of erosion (WWF, 2016). Soil erosion reduces agricultural potential with implications for food security and livelihoods. The recent drought in the Western Cape has sharply increased food prices, and hundreds of farmers facing declining crop yields have received financial assistance (WCG, 2016a).

Correctly applied synthetic and organic fertilizers enhance soil fertility and - because they can increase agricultural potential - can protect the natural environment from poorly conceived agricultural expansion (ARC, 2014). However, fertilizers are often overused and nutrient rich run off reporting to rivers and groundwater, and nitrous oxide emissions, may damage the environment. No new soil loss or degradation data has been compiled for the Western Cape since 2005, a significant barrier to understanding the quality of topsoil reserves in the province and the scale of loss of productive land.

4.2 Loss of future socio-economic opportunities and livelihoods

Based on the information presented in Table 3-2, land used for cultivation has decreased by 3.5% in the province. If this is the case, future socio-economic opportunities and livelihoods for those dependent on this industry are at risk. The agricultural sector in the Western Cape employs 23% of the national agricultural workforce and 18% of the total provincial workforce and is therefore an important employer (WCG, 2014b). Drought and excessive heat in 2015/16 reduced the wheat harvest by 200 000 tonnes (50-100% per farm in certain areas), the fruit harvest by 15%, while an estimated 17 000 cattle needed supplementary feed and 230 ha of potatoes were written off, (GreenAgri, 2016). This impact manifested not only the rural economy, but also in the urban economy where markets and agri-processing depend on the sustained growth of the agricultural sector. Up to 17 000 jobs may be permanently lost if the drought and water restrictions persist. This is a particular threat to seasonal workers, mostly in the fruit sub-sector where employment fluctuates with output (Sesant, 2017).

As discussed earlier, the greening of the agricultural sector (conservation and sustainable agriculture) is growing in the Western Cape, and while it has benefits for land health and sustainability, it has implications for the livelihoods of those working in agriculture. Sustainable agriculture embraces innovative methods and technology, unlike conventional farming methods, which tend to be labour intensive. Though conventional jobs may be lost, technologists will be required to operate

The Philippi Horticultural Area has been intensively farmed since the 17th century and once produced up to 50% of Cape Town’s fresh produce. The CCT has recently proposed two housing developments, which could reduce the size of this urban farmland by 3 000 ha (30%), potentially resulting in the loss of 4 000 jobs and 150 000 tons of vegetable and flower production annually*.
equipment, creating opportunities to upskill farmers and farm workers, increasing income for these beneficiaries.

In the urban context, the decline in livestock and crop farming from the urban fringe of the CCT to make way for mixed development has affected a number of households (PLAAS, 2017). One such area is the Philippi Horticultural Area on the Cape Flats, part of which was identified as a potential site for low cost housing (see insert).

As more land is rezoned for urban development, alternative livelihood options need to be presented to those displaced who, in most instances, lack the skills required for non-agricultural work. Urban agriculture, for example has been proposed by many as a livelihood strategy to improve food security and decrease urban poverty, particularly in informal settlements (Haysom, 2008).

4.3 Improved standard of living and livelihoods

An overall improvement in the standard of living in the Western Cape is just one benefit of improved land use planning and management. This is particularly true of the rural parts of the province, where the improved delivery of basic services, housing and socio-economic infrastructure (education and healthcare) has reduced both poverty and reliance on natural systems for services (StatsSA CS, 2016).

Pressure from the Western Cape Government (WCG) and stricter enforcement has eliminated the “dop” system (wine and other agricultural products in lieu of wages), offering fair wages to workers and affording them better access to goods and services they formerly could not afford.

Sustainable farming methods and funding have regenerated soil health on some smallholdings (and commercial farms) allowing small-scale farmers to be more competitive, while subsistence farmers are able to improve food security (WWF, 2016).

4.4 Reduced natural ecosystems, species and ecological processes

Anthropogenic drivers adversely affect land and its ability to support natural ecosystems, species and ecological processes. Drivers include the transformation of natural areas for agriculture, plantations and horticulture as well as expanded human settlements, infrastructure and services. Rapid development has occurred in coastal areas, regions with unique natural landscapes, flora and fauna, and biodiversity which underpin the tourism sector. However, even growth and hospitality developments within the tourism sector, have gradually degraded habitats and biodiversity in the province (WCG, 2013a). As population and human settlements continue to grow, negative impacts on biodiversity will continue with significant consequences for those reliant on subsistence activities and ecosystem services.

Education and awareness of the fundamental role that ecosystems play in both the natural system and within communities is not well understood by land users in the Western Cape (ARC, 2014), and capacity building would promote moderated usage of finite ecosystem services by communities that rely on them.

As such, ecosystem services and other unmonetised benefits of land in the Western Cape need to be managed in a way that ensures sustainability for future generations. Aesthetics, heritage and culture are all intrinsically linked to land in the Western Cape and should be considered in land use management policy. Other important pressures such as alien invasives, climate change and urban encroachment all jeopardise ecosystems and need to be mitigated.

5 RESPONSES

In the instance of land, a complex and dynamic element of the natural and anthropogenic system in the Western Cape, responses need to be multi-sectoral. This is largely because of the wide multitude of land uses in the province, but also because land use is intrinsically linked with the social and economic dynamics of the province.

Critically, the capacitating and upskilling of those who work in land policy, legislation and regulation, must be rolled out, as should education of land users, to ensure effective responses to land challenges and impacts. This will require collaboration by a range of stakeholders in the private and public sectors.

5.1 Mitigation and adaptation

5.1.1 Food security and sustainable agriculture

There is growing recognition of the need for ‘climate smart agriculture’, which focusses on climate change adaptation by building farmers’ climate resilience and improving livelihoods through poverty reduction and climate change mitigation. Programmes such as FruitLook aim to improve water use efficiency without compromising production while the Landcare programme strives to rebuild, maintain and improve the natural resources in the Western Cape (DEA&DP, 2014).

The Western Cape Green Economy Strategy Framework (WCG, 2013b) highlights smart agri-production as one of five drivers of the green economy in the province, and identifies the following priorities:

- Sustainable labour intensive farming;
- Farming practices that are in harmony with nature; and
- Water technologies that reduce consumption and increase efficiency.

Current priorities to respond to climate change induced food insecurity and nurture economically sustainable agricultural sector in the Western Cape include (DEA&DP, 2016):

- Farming practices that are in harmony with nature, i.e. ‘conservation farming’;
- Climate smart agriculture;
- Agricultural water technologies that reduce consumption and increase efficiency;
- Research on climate resilient and alternative crops and livestock appropriate to the Western Cape;
- Addressing climate vulnerability through the Municipal Support Programme; and
- Assessing food security in the context of the resource nexus.

In a collaborative effort, the Western Cape Departments of Agriculture (DoA) and DEA&DP launched the Smart Agriculture for Climate Resilience (SmartAgri) project in August 2014 (WCG, 2016c). Under the aegis of the University of Cape Town’s African Climate and Development Initiative (ACDI), a consortium prepared a provincial climate change response framework and implementation plan for the agricultural sector. The SmartAgri Plan builds on the WCCCRS and its Implementation Framework, specifically the focus area of “Food Security”. It also aligns
closely with the current five-year Provincial Strategic Plan. The SmartAgri Plan, completed in March 2016 following a 20 month study including intensive stakeholder engagement, proposes the following four Strategic Focus Areas:

- Promote a climate-resilient low-carbon production system that is productive, competitive, equitable and ecologically sustainable across the value chain;
- Strengthen effective climate disaster risk reduction and management for agriculture;
- Strengthen monitoring, data and knowledge management and sharing, and lead strategic research for climate change and agriculture; and
- Ensure good co-operative governance and institutional planning for effective climate change response implementation for agriculture.

The SmartAgri Plan provides a “roadmap” towards a more productive and sustainable future for the agricultural sector, to ensure the continued growth and competitiveness of the entire agricultural value chain.

The SmartAgri Plan is reinforced by six “Priority Projects”. These projects were developed both to deliver climate resilience to agriculture over the short- to medium-term, and to begin the transformative process required for long-term resilience and sustainability at a time when the climate will have changed significantly. They are:

- Conservation Agriculture for all commodities and farming systems;
- Restored ecological infrastructure for increased landscape productivity, socioecological resilience and soil carbon sequestration;
- Collaborative integrated catchment management for improved water security (quality and quantity) and job creation;
- Energy efficiency and renewable energy case studies to inspire the transition to low-carbon agriculture;
- Climate-proofing the growth of agri-processing in the Western Cape; and
- Integrated knowledge system for climate smart agricultural extension.

5.1.2 LandCare Programme

The LandCare Programme is a community-based and government-supported approach to the sustainable management and use of agricultural resources (WCG, 2014a). In effect, the programme seeks to promote community-led, ecologically sustainable land management benefitting those using the land. As such, cultivation, grazing and the harvesting of natural goods and services should be undertaken in a manner which does not degrade the land resource. Community initiatives are supported by the National government and WCG, and create green jobs, eradicate poverty, enhance food security and improve livelihoods while helping to reverse soil and land degradation.

LandCare services are delivered to clients in the Western Cape through:

- Resource conservation projects;
- LandCare projects; and
- Area wide planning.

Resource conservation projects are guided by regulations promulgated in terms of the Conservation of Agricultural Resources Act 43 of 1983. This includes the planning, survey, design and control of works (including disaster relief works) to prevent degradation of agricultural resources, and to propose sustainable utilisation of resources. Commercial farmers are also serviced through the resource conservation project, to encourage them to conserve the natural resources that will improve the quality and quantity of fruit and grapes for the export market.
LandCare projects will service all land users in the Western Cape, with special emphasis on smallholder farmers and communities. Twenty LandCare projects have been proposed for 2018, focusing on water saving, water quality and capacity building.

The area wide planning projects strive to sustain and improve environmental health through a natural resource management approach that integrates locally driven initiatives. It is an integrated community based natural resource management project, which integrates service providers to pro-actively plan an area together with the community, to set up a future desired and sustainable plan for that area (Francis Steyn, pers. comm.).

5.1.3 Conservation agriculture

Conservation agriculture’s overriding purpose is to improve the livelihoods of farmers through sustainable and profitable agriculture (WFP, 2017). The basic principles of conservation agriculture are to minimise soil disturbance, retain permanent soil cover and rotate crops. There is mounting national and provincial interest to apply the conservation agriculture approach, which aims to conserve water, use natural resources optimally and protect soils.

In the case of wheat farming in the Western Cape, conservation agriculture has been particularly successful, increasing production and profit while simultaneously reducing soil erosion and improving soil health and water quality. In partnership with the Western Cape Department of Agriculture and the Agricultural Research Council (ARC), wheat farmers were encouraged to replace traditional monoculture systems with conservation agriculture principles. Research by the ARC demonstrated to farmers that conservation agriculture was a cheaper way to produce wheat and mitigate a number of risks, including those associated with climate change. While initial costs (such as purchase of specialised conservation agriculture equipment) were high, the sustained use of conservation agriculture techniques reduced labour and fertilizer costs and increased farmers’ income. As of 2013, 166 000 ha of wheat in the Western Cape was grown using conservation agriculture techniques, at an average cost of R 2 387/ha to produce a three-ton yield. This is substantially less than the R 4 444/ha to produce the same yield using monoculture methods (ARC, 2014).

The improved soil health is a critical success for Western Cape farmers, as poor soil health and soil loss plague the provinces’ farmers and farm yields. Conservation agriculture techniques effectively increased soil moisture, decreased compaction and soil temperature, while increasing microorganisms needed to revive soil. Following the success of conservation agriculture in wheat farming, other farmers continue to adopt the method in the province, including smallholder farmers, whose struggle to compete hinders efforts to develop an inclusive rural economy in the province (ARC, 2014).
5.2 Policy, tools and legislation

The Spatial Planning and Land Use Management Act of 2013 (SPLUMA), the Western Cape Land Use Planning Act of 2014 and the Western Cape Provincial Spatial Development Framework of 2014 (PSDF) are the primary tools used to address spatial inefficiencies relating to land in the Western Cape. However, other legislation, policies and tools also address land issues and their impact on the receiving environment as discussed below and listed in Annexure A.

5.2.1 Spatial Planning and Land Use Management Act

SPLUMA was promulgated in mid-2015. It is an enabling Act to accommodate spatial planning and land use management legislation in South Africa, and encourages consistency across all procedures and decisions in spatial planning and land use management. In terms of SPLUMA, the mandate for spatial planning and land use management is devolved to local municipalities. All municipalities must therefore establish Municipal Planning Tribunals to enact SPLUMA effectively. The hope is that SPLUMA will ultimately facilitate optimal spatial transformation. Enabling components driven by the Act include Spatial Development Frameworks (SDF’s), land use schemes and land development applications.

5.2.2 Urban Edge Policies

Rapid urbanisation and urban growth have elevated concerns regarding effects on the receiving environment and the sustainability of urban development. The urban edge is a demarcated line to manage and control the outer limits of development in urban areas (WCG, 2009). Urban edges are a land use management measure prescribed by the PSDF growth management policies, to determine where urban development should stop (spatially) and to promote sustainable environmental/urban interactions. As such, defined urban edges in the Western Cape prevent undesirable urban growth, particularly encroachment into arable farmland and sensitive areas.

5.2.3 Western Cape Biodiversity Framework, Biodiversity Sector and Bioregional Plans

Municipal biodiversity plans and land-use guidelines have been compiled for Saldanha Bay, Cederberg, Bergrivier, Matzikama, Hessequa, Mosselbay, Breede River/Winelands, Breede Valley and Witzenberg Local Municipalities. The CCT Biodiversity Network and a Western Cape Biodiversity Framework has been developed to inform bioregional development-planning decisions in the city.

Spatial biodiversity information is increasingly being integrated into government spatial and development planning. GIS Maps and guidelines indicating the location of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) are used to inform land-use planning and environmental management. This enables efficient and environmentally sustainable development, including the appropriate placement of human settlements, agriculture and industry, away from threatened ecosystems. An important focus area of Western Cape policy is the Cape Floristic Region, which is highly vulnerable to climate change and anthropogenic pressures such as agriculture and housing developments.

The WCG is actively promoting the use of Biodiversity Sector Plans and Bioregional Plans, and building the capacity of officials to improve compliance with the conditions that safeguard biodiversity and ecosystem services. Importantly, the WCG has moved to mainstream biodiversity into their integrated planning tools, including Environmental Management Frameworks and the PSDF.
5.2.4 The South Africa Land Reform Programme

Launched in 1994, the South African Land Reform Programme is a threefold approach to addressing previous racial discrimination in the distribution and ownership of land: Redistribution seeks to grant the previously disadvantaged and the poor access to land. Land restitution addresses cases of forced removals that took place between 1913 and 1994. The Land Claims Court and Commission, was established under the Restitution of Land Rights Act 22 of 1994 to manage and oversee the process.

The reform of land tenure in both South Africa and the Western Cape is addressed through land policy, administration and legislation to ensure that improved tenure security is realised, acknowledging that a diversity of land tenure types need to be accommodated, including communal tenure.

6 CONCLUSION

OUTLOOK: INSUFFICIENT DATA BUT APPEARS TO BE DECLINING

Land is a non-renewable but irreplaceable resource, the management of which needs to be prioritised in the Western Cape. The sustainable use of the land resource requires critical action by the WCG. Any loss of or reduction in cultivated land and increase in the extent of degraded land, as witnessed in the central part of the Western Cape, will affect sustainability of the province, food security, livelihoods and land use options if affected by climate change. Unless processes are implemented to address growing rates of land transformation and the loss of agricultural land resources, the three indicators used to determine the state of land in the province will trend downwards.

Current data is outdated and or inconsistent (for land cover change and transformation). Consequently, the rate of land transformation in the province cannot be accurately evaluated. Thus, the priority 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, but again the exact change is difficult to evaluate due to deficient data sets. Rising population, economic development and global market pressures all exert pressure on land which warrants interventions to reduce current rates of land degradation, soil loss and loss of critical biodiversity areas.

Table 6-1 presents an overview of the key pressures, impacts, challenges, progress and recommended critical areas for action.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Summary of key points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pressures</strong></td>
<td>• Urban growth</td>
</tr>
<tr>
<td></td>
<td>• Agricultural expansion</td>
</tr>
<tr>
<td></td>
<td>• Climate Change</td>
</tr>
<tr>
<td></td>
<td>• Access to land</td>
</tr>
<tr>
<td></td>
<td>• Mining</td>
</tr>
<tr>
<td></td>
<td>• Improved and unsustainable farming methods</td>
</tr>
<tr>
<td><strong>Impacts</strong></td>
<td>• Loss of productive land</td>
</tr>
<tr>
<td></td>
<td>• Loss of future socio-economic opportunities and livelihoods</td>
</tr>
<tr>
<td></td>
<td>• Improved standard of living and livelihoods, particularly in rural areas</td>
</tr>
<tr>
<td></td>
<td>• Reduction of natural ecosystems, species and ecological processes</td>
</tr>
<tr>
<td><strong>Challenges</strong></td>
<td>• Poor/outdated knowledge base relating to land cover change, capability and</td>
</tr>
</tbody>
</table>
Table 6-2 presents the anticipated changes or outlook for the future of land, based on the findings in this chapter.

**Table 6-2: Summary of the outlook for land in the Western Cape**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Quantification</th>
<th>Target/Desired State</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land cover</strong></td>
<td>• 65.2% natural</td>
<td>• Protect/maintain current natural land cover</td>
<td>Declining</td>
</tr>
<tr>
<td></td>
<td>• 33.5% transformed</td>
<td>• As far as possible prevent further land transformation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 15.1% agriculture</td>
<td>• Manage / prevent increases in degraded land</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 0.9% urban</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 0.6% plantations</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 16.8% degraded</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Land capability</strong></td>
<td>• No high value agricultural</td>
<td>• Sustainable agricultural practices that enhance /protect/ make use of existing</td>
<td>Insufficient</td>
</tr>
<tr>
<td></td>
<td>soils - vulnerable agriculture</td>
<td>agricultural soils</td>
<td>Historical Data</td>
</tr>
<tr>
<td></td>
<td>requiring high inputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Land transformation</strong></td>
<td>• Decrease in cultivation by</td>
<td>• Maintain/manage degraded land to prevent increase in degradation</td>
<td>Declining</td>
</tr>
<tr>
<td></td>
<td>3.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 16.2% more degradation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6 Due to the new land capability classification system developed in 2016, the trend in land capability cannot yet be determined.
REFERENCES


Agricultural Research Council (2014). The impact of conservation agriculture on wheat production in Western Cape.


Vink, N. (2017). Why agriculture is important in the Western Cape. Department of agricultural economics, Faculty of agricultural and forestry sciences. University of Stellenbosch


WCG (2014b). Western Cape Provincial Profile: Agriculture.


<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International Responses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>Environmental certification of particular agricultural products</td>
<td>Voluntary, usually third party-assessed, norms and standards relating to environmental, social, ethical and food safety issues, adopted by companies to demonstrate the performance of their organizations or products in specific areas.</td>
</tr>
<tr>
<td>1994</td>
<td>United Nations Convention to Combat Desertification</td>
<td>Convention to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies.</td>
</tr>
<tr>
<td>1997</td>
<td>Organic production of food products</td>
<td>As an alternative agricultural system in reaction to rapidly changing farming practices.</td>
</tr>
<tr>
<td>2004</td>
<td>Stockholm Convention on Persistent Organic Pollutants</td>
<td>International environmental treaty, signed in 2001 and effective from May 2004, that aims to eliminate or restrict the production and use of persistent organic pollutants (POPs).</td>
</tr>
<tr>
<td><strong>National Responses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1983</td>
<td>Conservation of Agricultural Resources Act 1983</td>
<td>To provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants.</td>
</tr>
<tr>
<td>1989</td>
<td>Environmental Conservation Act 73 of 1989</td>
<td>To provide for the effective protection and controlled utilization of the environment and for matters incidental thereto.</td>
</tr>
<tr>
<td>1995</td>
<td>White Paper on Agriculture</td>
<td>The Interim Constitution of the Republic of South Africa requires that a new policy be established for Agriculture. In terms of the Constitution agricultural functions fall within the competence of provincial governments. However, not all such functions are allocated in toto to the provinces because of the overriding provisions of section 126(3) of the Constitution. A national agricultural policy is necessary and a distinction should therefore be made between national and provincial responsibilities towards agriculture and its different role-players.</td>
</tr>
<tr>
<td>1995</td>
<td>Working for Water Programme</td>
<td>This programme works in partnership with local communities, to whom it provides jobs, and also with Government departments including the Departments of Environmental Affairs and Tourism, Agriculture, and Trade and Industry, provincial departments of agriculture, conservation and environment, research foundations and private companies to remove invasive alien plants.</td>
</tr>
<tr>
<td>1997</td>
<td>White Paper on South African Land Policy</td>
<td>An integrated approach to the delivery of land and support services requiring the development of close working relations with the departments and levels of government.</td>
</tr>
<tr>
<td>1998</td>
<td>Agricultural Policy in South Africa: A Discussion Paper</td>
<td>The purpose of this policy is to facilitate a co-ordinated approach towards achieving an ecologically, socially and economically sustainable agricultural sector in South Africa that supports the government’s commitment towards poverty alleviation, food security and economic development. This emphasizes the creation of a prosperous agricultural sector while protecting the national biological and physical resource base, as well as enhancing human</td>
</tr>
<tr>
<td>Response</td>
<td>Year</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>1998</td>
<td>The National Environmental Management Act 107 of 1998</td>
</tr>
<tr>
<td></td>
<td>1999</td>
<td>Land Care Programme</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>The Integrated Sustainable Rural Development Strategy</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>National Department of Agriculture: Environmental Implementation Plan</td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td>A National Action Programme (NAP) on Combating Land Degradation</td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA)</td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td>Draft Preservation And Development Of Agricultural Land Bill</td>
</tr>
<tr>
<td></td>
<td>2016/17</td>
<td>Strategic Plan for South African Agriculture</td>
</tr>
<tr>
<td></td>
<td>2017</td>
<td>DRDLR: Revised Environmental Policy</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>The Policy for Farm Towns</td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>A Settlement Framework for the Western Cape</td>
</tr>
<tr>
<td></td>
<td>2005/6-2009/10</td>
<td>The Department of Agriculture’s Land Care and Area-wide Planning</td>
</tr>
<tr>
<td>Year</td>
<td>Description</td>
<td>Purpose</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>2010</td>
<td>Western Cape Biodiversity Framework</td>
<td>Aimed at integrating all biodiversity-planning products for the Western Cape into a common, user-friendly framework to give guidance in the land-use decision-making process.</td>
</tr>
<tr>
<td>2014</td>
<td>Western Cape Land Use Planning Act 3 of 2014 (LUPA)</td>
<td>To consolidate legislation in the Province pertaining to provincial planning, regional planning and development, urban and rural development, regulation, support and monitoring of municipal planning.</td>
</tr>
<tr>
<td>2014</td>
<td>Western Cape Provincial Spatial Development Framework</td>
<td>Coordinates, integrates and aligns Provincial plans and development strategies with policies of National Government; the plans, policies and development strategies of Provincial Departments; and the plans, policies and development strategies of municipalities.</td>
</tr>
<tr>
<td>2016</td>
<td>Western Cape Biodiversity Sector Plan</td>
<td>Is intended to help guide land-use planning, environmental assessments and authorisations; and, natural resource management in order to promote sustainable development.</td>
</tr>
</tbody>
</table>

**Local Authority Responses**

| Various | Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs) and Environmental Management Frameworks (EMFs) | IDP: an overall framework for development. It aims to co-ordinate the work of local and other spheres of government in a coherent plan to improve the quality of life for all the people living in an area. SDF: serves to give spatial direction to the IDP, and provide a common spatial agenda for diverse sector plans. EMFs: Studies biophysical and socio-cultural systems of a geographically defined area to reveal. Where specific land-uses may best be practiced and to offer performance standards for maintaining appropriate use of such land. |