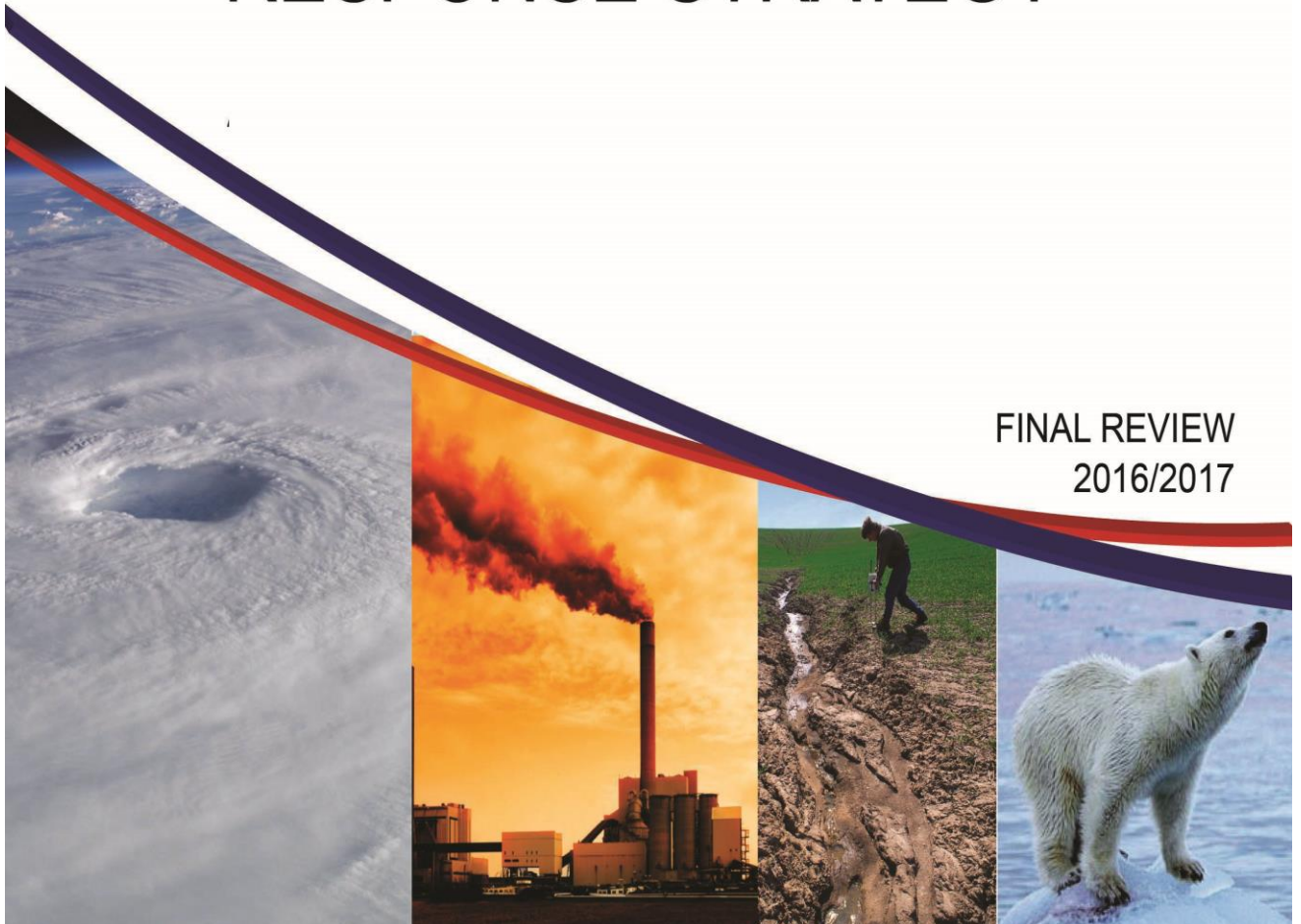




CAPE WINELANDS DISTRICT

MUNICIPALITY • MUNISIPALITEIT • UMASIPALA

FRAMEWORK FOR A DRAFT
CLIMATE CHANGE
RESPONSE STRATEGY



FINAL REVIEW
2016/2017

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FOREWORD: CLIMATE CHANGE IN THE WESTERN CAPE PROVINCE

South Africa is a country that contains both summer and winter rainfall regions, with the climate variability influenced by its geographic position, a large dynamic coastline framed by oceans and currents with differing temperatures and upwelling patterns, high mountain ranges, an inland plateau and vast areas of marginal semi-arid land. The Western Cape, which contains elements of all of the above geographical features, is no stranger to the effects of climate-related hazards, which pose a significant risk to the Western Cape's economy, ecosystems and population. Between 2003 and 2008 alone, direct damage costs associated with climate related extreme events in the Western Cape amounted to approximately R 3 161.1 million. During 2012 the total preliminary losses as reported by the various Municipalities, Provincial and National Departments as indicated in the first draft Cabinet Memorandum amounted to R 355 150 482-00. Extensive river bank erosion and damage to agricultural land was reported at 64 sites in the jurisdiction of the Cape Winelands and Eden District Municipal areas alone. These damages place a significant financial burden on service delivery, without taking into account the indirect costs of social, environmental and other disruptive impacts that typically characterise such events. The impacts associated with the future climate projections for the region will result in this burden increasing, particularly if climate vulnerability is not reduced across the province. Already a significant portion of the ecological infrastructure which should buffer against climate-related hazards, such as coastal barrier dunes, wetlands, and flood plains is compromised. Increasing magnitude and frequency of extreme events, temperature increases, altered rainfall patterns and changes in evaporation rates, etc., will further compromise the ability of the natural environment to buffer humans and human settlements against the impacts of climate hazards.

The percentage of global governments' Gross Domestic Product (GDP) being consumed by recovering from climate related disaster could, according to the Stern Review (2006), increase to between 5% and 20% by 2100. Against the backdrop of the socio-economic challenges faced by the country and the province, such increased disaster recovery costs pose a significant risk to the achievement of the Western Cape's growth and development goals (including those related to job creation).

Short, medium and long term adaptation interventions designed to ensure that the Western Cape does not compromise its growth and development strategy are, therefore, critical to ensuring reduced vulnerability to the impacts of climate variability and climate change across the Province.

SECTION 1:

1. INTRODUCTION AND CONTEXT

1.1 Introduction

This document constitutes a Framework for a Climate Change Response Strategy which was developed in house by a multi-disciplined task team. The framework is informed by the Western Cape Climate Change Response Strategy developed by the Western Cape Government, the Cape Winelands Spatial Development Framework Annexure 7, Climate Change Analysis (2011) the Cape Winelands Strategic Environmental Management Plan (2007) and Integrated Development Plan (2014). The aim of this document is to in a coordinated manner give strategic direction to departments within the Cape Winelands District Municipality in responding to challenges posed by the climate change phenomenon.

This framework is a first step towards identifying the types of projects and programmes that are being implemented by the various departments of the CWDM. The CWDM's functions limits our response to be more of an adaptive nature although some of the projects and programmes can be identified as being mitigative. In determining the types of projects and programmes (adaptation/mitigation) we intend to identify the gaps and plan accordingly. This approach will give greater structure towards our efforts and aims to draw on the momentum of work that has been done by relevant stakeholders within the landscape i.e. the Western Cape Government whom gives strategic direction through legislation and policies.

The Western Cape Provincial Government acknowledges the fact that in addition to the City of Cape Town there is very little capacity or budget to take on an additional portfolio such as climate change at local and district municipalities across the western cape province. It is due to the mentioned factors that the CWDM intend to mainstream climate change into policies/plans such as the CWDM Integrated

Development Plan, Spatial Development Framework, Integrated Transport Plan and other relevant plans/frameworks.

This document is divided into two sections. Section 1 is structured to give an overview of the mandatory context, climate change projections and possible impacts on important sectors. Section 2 focuses on strategic responses and possible gaps that the district municipality needs to plan for.

1.2 Defining Adaptation & Mitigation:

Adaptation:

According to the Intergovernmental Panel on Climate Change (IPCC) 2007, "Adaptation is the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. The following types of adaptation can be distinguished: **Anticipatory adaptation** –takes place before impacts of climate change are observed. Also referred to as proactive adaptation. **Autonomous adaptation** – Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. Also referred to as spontaneous adaptation. **Planned adaptation** – Adaptation that is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state.

Moser and Ekstrom (2010) developed the following definition which defines adaptation as: "Adaptation involves changes in social-ecological systems in response to actual and expected impacts of climate change in the context of interacting non-climatic changes. Adaptation strategies and actions can range from short-term coping to longer-term, deeper transformations, aim to meet more than climate change goals alone, and may or may not succeed in moderating harm or exploiting beneficial opportunities."

The abovementioned definitions recognize that adaptation to climate change takes place in a complex context where climate variability and change is only one of many stressors that require response. It also acknowledges that some adaptive

responses help deal with current variability and others may be more transformative and sustainable (able to maintain adaptive measure); yet there is no defined separation between the two and they can, and in fact in many circumstances should, be linked.

Mitigation:

According to the United Nations Environment Programme (UNEP), climate change mitigation refers to efforts to reduce or prevent emission of greenhouse gases. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behaviour. It can be as complex as a plan for a new city, or as simple as improvements to a cook stove design. Efforts underway around the world range from high-tech subway systems to bicycling paths and walkways. Protecting natural carbon sinks like forests and oceans, or creating new sinks through silviculture or green agriculture are also elements of mitigation.

1.3 Study Area: Cape Winelands District Municipal Area



1.4 Mandate for Developing a Framework for a Climate Change Response Strategy

The Municipal Structures Act, 1998 (Act 117 of 1998) outlines the roles, responsibilities and functions of district municipalities. Related to climate adaptation, the Act provides for the following roles and responsibilities for the Cape Winelands District Municipality in these broad areas such as:

- Master planning such as development of a framework through which local municipalities can develop their integrated development plans. These include the Spatial Development Frameworks and Disaster Management Plans.
- Solid waste management
- Health services
- Fire services

1.5 Policies, Plans and Frameworks consulted for this study:

| |
|--|
| Western Cape Climate Response Strategy (2014) |
| Cape Winelands District Spatial Development Framework (2011), Annexure 7: Climate Change Analysis |
| Cape Winelands Strategic Environmental Assessment, Environmental Strategy & Strategic Environmental Management Plan (2007) |
| Western Cape Rapid Assessment (2013) |
| Cape Winelands Integrated Development Framework (2014) |

2. CLIMATE CHANGE PROJECTIONS AND POSSIBLE IMPACTS FOR THE WESTERN CAPE: WHY A RESPONSE STRATEGY IS NECESSARY

Climate adaptation is about reducing climate vulnerability and developing adaptive capacity to cope with what is unavoidable. The Cape Winelands District Municipal area as per projections is prone to the detrimental effects of climate related impacts such as flooding, fires and drought. The district municipality therefore need assist provincial efforts and contribute by developing a sound response.

A study by the Climate Systems Analysis Group (CSAG) at the University of Cape Town (UCT) (2008) modelled the impact of the expected climate change for the Western Cape for the 2030 - 2045 period. The following climate changes are projected.

Table 1: Climate change projections and examples of potential impacts for the Western Cape

| PROJECTION | EXAMPLE OF POSSIBLE IMPACTS |
|--|---|
| Higher mean annual temperature | <ul style="list-style-type: none"> • Increased evaporation and decreased water balance; • Increase wild fire danger (frequency and intensity). |
| Higher maximum temperatures, more hot days and more heat waves | <ul style="list-style-type: none"> • Heat stress on humans and livestock; • Increased incidence of heat-related illnesses; • Increased incidence of death and serious illness, particularly in older age groups; • Increased heat stress in livestock and wildlife; • Decreased crop yields and rangeland productivity; • Extended range and activity of some pests and disease vectors; • Increased threat to infrastructure exceeding design specifications relating to temperature (e.g. traffic lights, road surfaces, electrical equipment, etc.); • Increased electric cooling demand increasing pressure on already stretched energy supply reliability ; • Exacerbation of urban heat island effect. |
| Higher minimum temperatures, fewer cold days and frost days | <ul style="list-style-type: none"> • Decreased risk of damage to some crops and increased risk to others such as deciduous fruits that rely on cooling period in autumn; • Reduced heating energy demand; • Extended range and activity of some pests and disease vectors; • Reduced risk of cold-related deaths and illnesses. |
| General drying trend in western part of the country | <ul style="list-style-type: none"> • Decreased average runoff, stream flow; • Decreased water resources and potential increases in cost of water resources; • Decreased water quality; • Decrease in shoulder season length threatening the Western Cape fruit crops; |

| | |
|--|---|
| | <ul style="list-style-type: none"> • Increased fire danger (drying factor); • Impacts on rivers and wetland ecosystems. |
| Intensification of rainfall events | <ul style="list-style-type: none"> • Increased flooding; • Increased challenge to storm water systems in urban settlements; • Increased soil erosion; • Increased river bank erosion and demands for protection structures; • Increased pressure of disaster relief systems; • Increased risk to human lives and health; • Negative impact on agriculture such as lower productivity levels and loss of harvest. |
| Increased mean sea level and associated storm surges | <ul style="list-style-type: none"> • Salt water intrusion into ground water and coastal wetlands; • Increased storm surges leading to coastal flooding, coastal erosion and damage to coastal infrastructure; • Increased impact on estuaries and associated impacts on fish and other marine species. |

As is evident in a number of the above listed projections, there is a risk of drier conditions across the province as a whole on the 40 year time horizon. In contrast, however, historical trends and some downscaled projections suggest that western and southern mountain ranges could experience wetter conditions. This apparent contradiction serves to highlight the complexity of climate drivers and responses, which in turn illustrates the inherent difficulties faced by decision makers when required to plan for climate resilience into the future. The complexity highlights the need for adaptive and flexible responses to climate variability and change that are not focused on fixed timescales or unidirectional change.

3. CLIMATE CHANGE IN THE CONTEXT OF THE CAPE WINELANDS DISTRICT MUNICIPALITY

3.1 Possible Impacts on the Economy: Vulnerable Sectors

This section is informed by the Cape Winelands District Spatial Development Framework (2011), Annexure 7: Climate Change Analysis.

The Cape Winelands area which is home to 692 291 people falls within three water catchments areas namely the Bergriver, Breede and Oliphants/Gouritz River Catchments where water supply is largely insufficient. The impacts of climate change in the district, in terms of precipitation and temperature, will contribute strain to an already water-stressed environment. This projection puts further strain on government when considering that the CWDM area has a 21% unemployment rate with 25% of its inhabitants living in poverty.

This section looks at the impacts on the major economic sectors. Being the second largest economy in the Western Cape, the district contributes 10 % to the Gross Domestic Product (GDP). The diverse economic base is made up of the following:

- Manufacturing (17.1%),
- Finance, real estate and business services (18.3%),
- Wholesale and retail trade, catering and accommodation (14.6%),
- Agriculture & forestry (14.7%),
- General government services (23.3%) and
- Transport, storage and communication (6.2%).

3.1.1 Agriculture

The agricultural sector is directly responsible for 23% of formal employment opportunities in the Cape Winelands district. The most important agricultural activities in the area are poultry farming, viticulture and horticulture - a large proportion of which is grown for export markets. It is also one of the largest water users (due to irrigation) forming the backbone of the local economy and other sectors such as tourism, manufacturing, wholesale and trade. These industries are dependent on its linkages (Boland District Municipality, 2004). Plant growth and therefore food production is determined by temperature, moisture, solar radiation

and soil conditions. It follows that changes in these conditions directly impacts agriculture.

Fruit industry

A case study by Louw (2007), states that the fruit industry is impacted upon more by extreme events than by changes in averages. For example, if heat waves raise temperatures above 35°C, average yield losses will increase from 10% to 50%, resulting in large economic losses in the district.

Water quality and quantity in the context of fruit farming are also important aspects to consider. The quality of water in the district was in some areas found to be substandard for imports to the European Union. This is largely attributed to increased pollution levels where informal settlements are located along major rivers (Louw, 2007). This decline in water quality could be further exacerbated by climatic change, since concentrations of *E. Coli* is predicted to increase under higher temperatures. It follows that increased bacteria in river systems also has health implications for the district.

According to Midgley et al. (2005), the availability of water resources in the region is limited, with little scope for increasing water supply in the form of constructing new dams. The already tightened water supply conditions are vulnerable to drought, as is periodically experienced in the region. Therefore a decrease in the availability of water will have numerous repercussions in this region and adaptations will be required are much greater efficiency in use. Since fruit trees are sensitive to soil moisture, extreme rainfall and flooding can have major impacts on quality and quantity of fruit yields. As a result of changing climate conditions, fruit farmers are starting to substitute orchards with vineyards (Louw, 2007).

Viticulture

Even though a variety of deciduous fruit and vegetables are products of the District, viticulture is the main agricultural activity. In a national context, approximately 76% of producer cellars and 84% of private wine cellars are located in the Cape Winelands (SAWIS, 2014). During the wine making process, a lot of water is used in cleaning and manufacturing practices. This is in addition to any irrigation methods that may be used. It is estimated that between 1 and 4 litres of water are required in

the production, excluding irrigation, of every litre of wine (Carter, 2006). According to Carter (2006) climatic conditions are critical in the viticulture industry as wine production has narrow climate suitability. Climate variability determines the annual fluctuations in vintage quality.

In terms of direct increase in carbon dioxide emissions, an increase in CO₂ encourages greater biomass accumulation (larger fruit/yields), which could lead to an inferior quality of vine, subsequently affecting prices and profitability. On the other hand, decreased precipitation leads to reduced water availability. The impacts of water shortages on the wine industry might include:

- *Increased price of wine* – production inputs increased from higher water pricing, increased use of irrigation water, implementing drip irrigation schemes to all vines or uprooting of cultivars less suited to future climate.
- *Reduced number of wine growers* – smaller profit margins discourage new enterprises (large capital investment needed on outset), growers already making low returns forced out of business, borderline climatic zones pass threshold of temperature suitability (wines quality reduced and therefore less profitable).
- *Implementation of adaptive strategies* – shade netting, drip irrigation etc. and/or the planting of more suitable cultivars (Carter, 2006).

In recent studies, the warming trend has increased the quality of wines. However, in some areas where the warming has been more pronounced, there seems to be a threshold over which quality can be forfeited if ripening occurs too early (Carter, 2006). Higher temperatures as a result of climate change also affect moisture levels and will translate to increased evapotranspiration. According to Carter (2006), increased evapotranspiration may lead to increased water stress and subsequently lower yields. This in turn may impact on marginal returns on the product.

The productivity of this industry also has major implications for employment in the region with 23% of the area's labour force employed by the agricultural sector (Stats SA, 2011). A large proportion of unskilled labourers are dependent on seasonal

employment during the pruning and harvesting seasons in the grape and fruit producing areas of the district. Fluctuations in productivity may place pressure on social services and infrastructure. In addition, it may contribute to uncertainty regarding the unemployment rate in the district (CWDM Growth & Development Strategy, 2006).

Furthermore, the wine industry and environmental eminence of the district, draws a lot of visitors to the area and is a large contributor to the tourism industry. According to the Cape Winelands District Municipality (2006), tourism real estate accounts for 97% of investments in the area. According to the Regional Tourism Trends (2014) currently 51.9% of overseas tourists and 47.3% domestic tourists visiting the Western Cape Province visit a wine route. In the Cape Winelands, the wine industry is much wider than signified by the ordinary meaning of the word 'wine'. Brandy and activities associated with its production, such as rebate wine and distilling wine, have always formed a significant part of the Cape Winelands wine industry. In recent years, grape juice and grape juice concentrate for use in non-alcoholic beverages, and not just for the sweetening of wine, has also become more prevalent (SAWIS, 2014)

The South African Wine Industry Information & Systems (SAWIS, 2006) reports that visitors are also attracted by numerous culinary festivals, wine competitions and shows, arts/culture fairs, open-air shows, harvest festivals, flower shows, fun runs and marathons, carnival and events held by the University of Stellenbosch and the other tertiary institutions. Other popular activities include church and school bazaars, arts and crafts stalls, music shows, theatre and drama events, etc.

Evidently, the link between the wine industry, conservation and tourism provides employment opportunities. It also contributes to the upliftment of rural communities and the heritage of the district. It is therefore suggested that declines in the productivity of the wine industry or the integrity of the natural environment will have direct impacts on the benefits generated from tourism and result in economic losses.

It is clear that climate change has the potential to have a severe impact on agriculture in the district. Not only will competition in the water market increase, but the agricultural losses will have a large impact on local economy (Louw, 2007).

3.1.2 Manufacturing Sector

The manufacturing sector is also characterized by its linkages to the agricultural sector. The main manufacturing activities in the Cape Winelands District are in the food and beverage sectors, more specifically wine and brandy, juice products, dried and tinned fruits. The Cape Winelands wine industry thus encompasses wine (natural, fortified and sparkling), rebate wine, distilling wine, brandy and other spirits distilled from distilling wine, grape juice, and grape juice concentrate for use in wine and non-alcoholic products (SAWIS, 2014). Some of the main manufacturers include KWV Holdings, the largest wine organization in South Africa. Another dominant manufacturing industry is the production of dried fruit, SAD being South Africa's leading producer of dried fruit products. These industries are likely to be impacted by climate change through changes in supply, operations, employment as well as preferences in the consumer market. The sectors assumed to be most vulnerable to changes in climate are those whose processes add value to natural resources i.e. agricultural products, forestry products, paper etc. (Wesgro, 2004).

However, some manufacturers may not be negatively impacted by climatic changes, such as those operating in climate control e.g. air-conditioning, coping with extreme events, water conservation and recycling businesses (Wesgro, 2004).

Other indirect impacts may include government policies such as carbon taxes, increase in production costs and customer behavior. For example, clothing preferences may change due to climatic changes (Business Day, 2005).

3.1.3 Other Services

The Financial, Real Estate and Business Services sector is continually expanding with the improvement of the economic environment in the region. Activities in this sector, especially tourism real estate, accounts for 97% of investments in the area. Corporate and institutional head offices located in the district include British

American Tobacco, Medi-Clinic Corporation, Distillers Corporation and KVV Holdings. Wholesale and retail is another sector that is closely linked to the agricultural and manufacturing sectors. Therefore, impacts on the aforementioned sectors will have an indirect impact on business and financial services.

3.1.4 Health

The health impacts of climate change are largely unfamiliar but there is growing evidence that the effects will be (and in some cases already are) profound. In recent years, assessments of these effects have shifted from projections and models to scientific observations (Louw, 2007). Many of the leading causes of premature mortality in the rural and informal settlements of Cape Winelands district are closely related to environmental health, socio-economic conditions, the availability of clean water and access to sanitation. These causes (excluding Drakenstein and Stellenbosch) are:

- Tuberculosis
- HIV/AIDS
- Homicide
- Road traffic deaths
- Pneumonia
- Chronic obstructive pulmonary disease
- Ischaemic heart disease
- Low birth weight and respiratory distress syndrome
- Stroke
- Diarrhea

According to the Western Cape Government Regional Development Profile (2012) the 89 public health care (PHC) facilities within Cape Winelands comprise of 5 community day centres, 44 clinics, 7 satellite clinics, 27 mobile clinics, 4 district hospitals and 2 regional hospitals. Within the Cape Winelands District, Drakenstein Municipality has the largest number of PHC facilities at 27, followed by Breede Valley at 19, Witzenberg at 17, Langeberg at 14 and Stellenbosch Municipality at 12. Cape Winelands District furthermore has 10 ambulance facilities located across the

region with 2 in Witzenberg, 1 in Drakenstein, 1 in Stellenbosch, 3 in Breede Valley and 3 in Langeberg.

3.2 Way forward: Global Adaptation Options for Sectoral Impacts

Table 1 (Source: IPCC (2007): Adaptation options for sectoral impacts.

| Sector | Adaptation option/strategy | Underlying policy framework | Key constraints and opportunities to implementation ¹ |
|---|--|--|---|
| Water | Expanded rainwater harvesting; water storage and conservation techniques; water re-use ¹ desalination; water-use and irrigation efficiency | National water policies and integrated water resource management; water-related hazards management | Financial, human resources and physical barriers; <i>integrated water resource management; synergies with other sectors</i> |
| Agriculture | Adjustment of planting dates and crop variety; crop relocation; improved land management e.g. erosion control and soil protection through tree planting | R&D policies; institutional reform; land tenure and land reform; training capacity building; crop insurance; financial incentives e.g. subsidies and tax credits | Technological and financial constraints; access to new varieties; markets; <i>Longer growing season in higher latitudes; revenues from 'new' products</i> |
| Infrastructure/settlement (incl. coastal zones) | Relocation; storm surge barriers; land acquisition and creation of marshlands/wetlands as buffer against flooding; protection of existing natural barriers | Standards and regulations that integrate climate change considerations into design; land-use policies; building codes; insurance | Financial and technological barriers; availability of relocation space; <i>integrated policies and management; synergies with sustainable development goals</i> |
| Human health | Emergency medical services; improved climate-sensitive disease surveillance and control; safe water and improved sanitation | Public health policies that recognise climate risk; strengthened health services; regional and international cooperation | Limits to human tolerance (vulnerable groups); knowledge limitations; financial capacity; <i>upgraded health services; improved quality of life</i> |
| Transport | Relocation; design standards and planning for roads, rail and other | Integrating climate change considerations | Financial and technological |

| | | | |
|--|--|---|--|
| | infrastructure to cope with warming and drainage | into national transport policy; investment in R&D | barriers; availability of less vulnerable routes' <i>Improved technologies and integration with key sectors</i> |
|--|--|---|--|

4. STAKEHOLDERS/INITIATIVES OPERATING IN THE CWDM LANDSCAPE:

4.1. Ecosystem Service: Land and Soil

4.1.1 Department of Agriculture's LandCare Program.

LandCare is an integrated community-based approach to the sustainable management and use of agricultural natural resources. The overall objective is to optimise productivity and sustainability of natural resources, leading to greater productivity, food security, job creation and a better quality of life for all. LandCare uses the concept of area wide planning and has a local issue-driven approach. It operates on specific projects fostering partnership between government, LandCare groups and communities, non-government organisations and industry. Emphasis is placed on ownership of the process by the local community involved. The program also place emphasis on increasing awareness of Land care issues.

4.1.2 Biodiversity and Wine Initiative

The BWI is a partnership between the South African wine industry and the conservation sector set up to minimise the further loss of threatened natural habitat, and to contribute to sustainable wine production. The initiative aims to prevent further loss of habitat in critical areas; increase the total area set aside as natural habitat in contractual protected areas; and promote changes in farming practices that support biodiversity and sustainability. The initiative uses the adoption of biodiversity-friendly and sustainable practices as a marketing advantages for the wine industry. Biodiversity guidelines have been incorporated into the current Integrated Production of Wine (IPW) guidelines, which manage the environmental impacts of the wine industry.

4.1.3 Integrated Production of Wine (IPW)

IPW is a voluntary auditing system to manage the environmental impacts of wine production. Membership of IPW constitutes 90% of all wine production in South Africa. The system operates on an auditing basis according to guidelines, which encourage good agricultural practices. There are detailed sections in the guidelines, which cover soil and land management.

4.1.4 Department of Water Affairs Working for Water Program

The Working for Water (WfW) programme, launched in 1995 and administered through the Department of Water Affairs and Forestry, spearheads the fight against invasive alien plants. 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. Since its inception in 1995, the programme has cleared more than one million hectares of invasive alien plants providing jobs and training to approximately 20 000 people. WfW currently runs over 300 projects in all nine of South Africa's provinces.

4.1.5 Industry bodies that support good agricultural practices

Such bodies in the wine industry include Winetech and the South African Society for Enology and Viticulture (SASEV) and in the fruit industry, the Deciduous Fruit Producers Trust (DFPT). The function of these bodies is in part to transfer technology to producers in the industries. Such technologies are generally focused on improving sustainability and include initiatives relating to land and soil management.

Accreditation organisations that support good agricultural practices

Several international organisations accredit agricultural producers on an auditing basis according to good agricultural practice guidelines. Many international markets require such accreditation. The most important of such organisations in the South African fruit industry is EurepGAP. EurepGAP guidelines include detailed sections relating to soil and land management. These market driven initiatives have a

significant influence on encouraging good agricultural practices, including sustainable soil and land management in the Cape Winelands District Municipality.

4.2 Ecosystem Service: Water Resources

4.2.1 Catchment Management Agency establishment

The National Water Policy and the National Water Act envisages the empowerment of local communities in the management of their water resources. This will primarily be achieved through the Catchment Management Agencies (CMAs) established for each of the country's 19 Water Management Areas (WMAs). The Cape Winelands District Municipality Area falls within two of these WMAs; the Berg and Breede-Overberg. The Breede-Overberg CMA has five functions, namely:

- Investigate, and advise interested persons on the protection, use, development, conservation, management and control of the water resources;
- Develop a catchment management strategy;
- Co-ordinate the related activities of water users, and of water management institutions;
- Promote the coordination of the implementation of its catchment management strategy with the implementation of applicable water management and development plans; and
- Promote community participation in its functions.

Local authorities are able to make a valuable contribution to the public consultation process, and to the constitution of the CMA reference group and the Catchment Management Committee. CMAs rely on local authorities to provide them with information on the state of water resources from which municipalities abstract their water (i.e. dam levels, groundwater levels and water quality). Municipalities also play an important role in the management of water resources through their influence on land-use and the water consumption patterns of citizens and industry.

4.2.2 National Spatial Biodiversity Assessment (NSBA)

The NSBA represents South Africa's first national assessment of spatial priorities for conservation action, integrating terrestrial, river, estuarine and marine ecosystems, using available spatial data, biodiversity planning software and a series of expert and stakeholder workshops. The NSBA is part of the National Biodiversity Strategy and Action Plan (NBSAP), which aims at the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources. The NSBA focuses on mainstreaming biodiversity priorities throughout the economy, and making links between biodiversity and socio-economic development. This will form an important input to local and regional level decision-making on land-use and the use of water resources.

The management of local ecosystems are best achieved through local level decision-making that is informed by local scale monitoring of ecosystems. This allows for local complexities to be addressed quantitatively, as opposed to simplistic desktop management solutions imposed from a centralized government perspective (MacKay, 2006). Local authorities therefore need to become aware of the goods and services that their local ecosystems provide, so that they may facilitate the mobilisation of local communities in the monitoring and care for such ecosystems for biodiversity. Many water resource management decisions will be made by the CMAs or by Water User Associations. Local authorities should be party to these decision-making processes and where necessary highlight the role and contribution of ecosystems to sustainable development.

4.2.3 Cape Action Plan for People and the Environment (C.A.P.E.)

Cape Action for People and the Environment (C.A.P.E.) is a programme of the South African Government, with support from international donors, to protect the rich biological heritage of the Cape Floristic Region. The programme seeks to unleash the economic potential of land and marine resources through focused investment in development of key resources, while conserving nature and ensuring that all people benefit (C.A.P.E., 2007). The C.A.P.E. Project addresses the distribution of biodiversity, threats, and priorities for conservation in terrestrial and aquatic ecosystems, and plans to implement the identified conservation priorities. (WWF, 2006).

Some of the initiatives that followed from C.A.P.E., which are particularly relevant to sustainable development in the area of the Cape Winelands District Municipality Area are (WWF, 2006):

- Conservation incentives on private and communal land: The project focuses conservation effort on strategic partnerships with and empowerment of civil society and the development and use of co-operative management models and incentive schemes. This will ensure that priority areas in non-state ownership establish biodiversity corridors linking large habitat parcels through landscapes gradients, while conserving vital lowland habitat.
- Flower Valley Conservation Trust: The project aims to develop public image and market positioning of wild fynbos harvested in a sustainable manner, establishing it as a recognized and viable alternative to other forms of land-use and thus contributing to biodiversity conservation in the Cape Floristic Region. It also aims to develop capacity-building strategies to empower previously disadvantaged communities through adopting a partnership approach to business co-management.
- Slanghoek Valley hotspot identification project: The project is a fine scale conservation plan for the area that will give land owners, land use planners and conservation agencies vital information about where the important biodiversity is, what must be conserved and what can be developed. This initiative was initiated by landowners and the National Department of Agriculture (NDA), following on from the LandCare Programme.

Local authorities have a responsibility to manage public land under their control in a sustainable manner. The contribution of such initiatives to biodiversity conservation can be amplified through coordination and cooperation with private land owners. At the same time the opportunity exists to utilise such land for development and job creation through the harvesting of natural vegetation.

4.2.4 Working for Water (WfW)

The WfW programme is an initiative of the Department of Water Affairs and Forestry (DWAF), which aims to increase the sustainable flow of water in our rivers and protect biodiversity in the Cape Floristic Kingdom through the removal of alien vegetation. At the same time employment is created in local communities. The success of the WfW model in employment creation and water/biodiversity enhancement could be copied or built upon by local authorities in local land care initiatives, such as wetlands rehabilitation or erosion prevention works.

4.2.5 Working for Wetlands

The Working for Wetlands Programme, under the auspices of the Department of Environment Affairs and Tourism focuses on the rehabilitation of wetlands, but has increasingly shifted its emphasis to the protection of targeted wetlands and promoting the sustainable use of others. An important component of these initiatives is the building of public awareness of the role that wetlands play in catchments and the goods and services that they provide. Critical to the success of the programme is the early identification of particularly valuable and sensitive wetlands. Local communities who use and interact with wetlands can be an important source of information on wetlands and changes in their state. Local authorities should be aware of the wetlands that exist in their area of jurisdiction, and make use of the opportunities at wetlands protection and rehabilitation that is offered by the Working for Wetlands Programme.

4.2.6 LandCare Area Wide Planning

The Western Cape Provincial Spatial Development Framework encourages LandCare area wide planning as a means of natural resource management. The LandCare Programme of the Western Cape Department of Agriculture aims to conserve, protect, improve, and sustain natural resources and the environment, by means of integrated planning of farms, the design of soil conservation works, as well as control over the judicious fragmentation of agricultural land. LandCare Area Wide Planning is a community-based natural resource management methodology to enable local people to identify and address the concerns of their community while striving to improve or maintain the health of the land. Area Wide Planning aims

to integrate social, economic and ecological concerns over defined geographical areas, at a scale larger than an individual farm plan. Area Wide Planning involves partnerships with other government departments, non-governmental organisations and international resource agencies.

4.3 Ecosystem Service: Biodiversity

4.3.1 The Cape Action for People and the Environment (C.A.P.E.) Programme

This programme is a partnership programme that seeks to “conserve and restore the biodiversity of the CFR and adjacent marine environment, while delivering significant benefits to the people of the region”. This biodiversity strategy and action plan was prepared in 2000 and includes a long-term strategy and vision for the biodiversity conservation of the CFR and a five year action plan and investment programme to address conservation priorities. C.A.P.E. is co-ordinated by the C.A.P.E. co-ordination unit which is hosted by South African National Biodiversity Institute (SANBI), but the responsibility for implementing the strategy falls on the key executing agencies including CapeNature, Department of Environmental affairs and Development Planning (DEA&DP), Department of Water Affairs and Forestry (DWAF) and the Provincial Department of Agriculture: Western Cape as well as SANBI and several NGOs.

The C.A.P.E. programme is made up of six components:

Component 1: Institutional strengthening.

Component 2: Conservation education.

Component 3: Programme co-ordination, management and monitoring framework.

Component 4: Unleashing the potential of priority protected areas.

Component 5: Establishing the foundations of the biodiversity economy to enhance conservation stewardship in key lowland landscapes.

Component 6: Integrating biodiversity concerns into watershed management.

Component 5 has two sub-components which are directly relevant to this study:

Component 5.1: Undertaking fine-scale biodiversity planning;

Component 5.2: Integrating biodiversity in land-use decision-making, including:

- Integrating biodiversity plans into spatial development frameworks and decision-making,
- Strengthening land-use regulation,

- Building institutional and individual capacity in municipalities in priority areas.

4.3.2 South African National Biodiversity Institute (SANBI)

The National Botanical Institute (precursor to SANBI) recognized the need to respond to the increasingly dynamic global and national policy environment on biodiversity and, as a result the Directorate for Biodiversity Programmes, Policy and Planning was established in July 2001. On the 31st of May 2004 President Thabo Mbeki signed the Biodiversity Act. The Act allowed for the establishment of the South African National Biodiversity Institute (SANBI).

The purpose of the Biodiversity Programmes, Policy and Planning Directorate is to ensure that SANBI responds appropriately to biodiversity-related global policy and national priorities making systematic contributions to the development of national biodiversity priorities, demonstrates the value of conserving biodiversity and the relevance of biodiversity to the improvement of the quality of life of all South Africans.

Two projects coordinated by SANBI, and of relevance to the CWMDA are the:

a) National Spatial Biodiversity Assessment (NSBA), SANBI & DEA

The NSBA forms part of the National Biodiversity Strategy and Action Plan (NBSAP) and is co-funded by the Department of Environmental Affairs and Tourism (DEAT) and SANBI. SANBI is closely involved in supporting DEAT in the development of South Africa's NBSAP. The NSBA is a first for South Africa and it is required for the new Biodiversity Act. It will be updated every five years or more frequently as new data becomes available. The aims of the NSBA are to:

- identify broad spatial priority areas for conservation action
- make recommendations about options for conservation action in each priority area
- provide a national context for conservation plans at the sub-national scale

The NSBA covered terrestrial, river, estuary and marine components. Initial results have identified nine broad priority areas for conservation action in South Africa. The technical reports from these 4 components and the NSBA Summary can be downloaded at: <http://www.sanbi.org/frames/biodiversityfram.htm>. SANBI is playing

a lead role in the development of fine scale biodiversity plans in five priority areas of the CFR (Riversdale Coastal Plain, Nieuwoudville, North West Sandveld, Saldanha Peninsula and Upper Breede River). This forms part of the implementation phase of the C.A.P.E. Programme. Fine scale biodiversity plans are a key tool in guiding land-use decision-making and sustainable development.

b) Threatened Species Programme (TSP) and CREW (Custodians of Rare and Endangered Wildflowers), SANBI

One of the greatest challenges facing the Threatened Species Programme is the deficiency of information on rare, remote and newly described species as well as about the impacts of threats in specific areas. The TSP and the CREW project were developed with the specific aim of filling these information gaps. CREW is made up largely of members of the public who volunteer to undergo training on plant identification and then collect much-needed data on rare and endangered plants in their local areas. So far 7 interest groups and communities have become involved in this challenging and enjoyable project and are actively participating in the conservation of their plant resources. The CREW Programme has been in operation for three years. SANBI and Botanical Society of South Africa are now assisting CREW to establish civil society groups nationally to conserve rare plant populations.

4.3.3 Botanical Society of South Africa: Putting Biodiversity Plans to Work Project

Broad scale biodiversity plans which incorporate parts or all of the Cape Winelands area include CAPE (1999), SKEP (2002), and the NSBA (2004). These biodiversity conservation plans are all done at the 1:250 000 scale and indicate geographic priorities for biodiversity conservation. Some fine scale planning has already been undertaken for the Cape lowlands Renosterveld and other final scale planning exercises are currently underway for other priority areas identified in the broad scale biodiversity conservation plans. The Putting Biodiversity Plans to Work (PBPTW) project was a pilot study focussed on developing fine scale biodiversity priority maps for seven local municipalities, including Drakenstein Local Municipality, undertaken between March 2004 and July 2006. Outputs from this project include a package that provides relevant biodiversity information for the ongoing development of the Drakenstein Municipality's Spatial Development Framework. The package centres around the Biodiversity Priorities Map and Poster prepared by the Putting Biodiversity Plans to Work project, which highlight areas within the municipality that are

important to biodiversity over the long term. This product aims to help users interpret maps and GIS information and apply these products to development and planning applications. It also aims provide the municipalities with biodiversity information to contribute to their SDFs and other relevant documents such as SoERs and SEAs. The map and poster are accompanied by a guidance booklet (Biodiversity Priority Areas in Drakenstein Municipality- supporting land-use decision-making in threatened ecosystems and special habitats) that states in more detail what biodiversity features are important within the municipality, and offers guidelines on wise decision-making in biodiversity priority areas and supporting information to back up land-use decisions in these areas.

4.3.4 SKEP (Succulent Karoo Ecosystem Programme)

Succulent Karoo Ecosystem Programme (SKEP) evolved out of a one-year planning exercise that worked to establish a broad consensus on a set of conservation targets for the Succulent Karoo. As a result of this process an ecosystem profile was produced for the CEPF (Critical Ecosystem Partnership Fund) that identifies key conservation areas for investment. Conservation targets have been set for the next 20 years that focus on the conservation and protection of 135 vegetation types. Conservation targets take into account key climatic gradients and riverine corridors, threatened species, hotspots of unique and endemic species in the creation or expansion of any protected areas.

4.3.5 The Biodiversity and Wine Initiative (BWI)

The BWI is a pioneering partnership with the South African Wine Industry, individual farmers and the conservation sector to incorporate biodiversity best practice guidelines in wine production. The aim of this project is to minimise the further loss of threatened natural habitat and to contribute to sustainable wine production. The primary strategy of the BWI is to identify and enlist interested producers as members or champions of the initiative, who will implement the biodiversity guidelines, conserve critical ecosystems and incorporate a biodiversity story into their winery experience.

4.3.6 River Health Programme

The South African River Health Programme (RHP) primarily makes use of biological indicators (e.g. fish communities, riparian vegetation, aquatic invertebrate fauna) to assess the condition or health of river systems. The rationale for using biological monitoring is that the integrity of biota inhabiting river ecosystems provides a direct, holistic and integrated measure of the integrity or health of the river as a whole.

The goal of the RHP is to serve as a source of information regarding the ecological state of river ecosystems in South Africa, in order to support the rational management of these natural resources.

The objectives of the RHP are to:

Measure, assess and report on the ecological state of aquatic ecosystems;

Detect and report on spatial and temporal trends in the ecological state of aquatic ecosystems;

Identify and report on emerging problems regarding aquatic ecosystems;

Ensure that all reports provide scientifically and managerially relevant information for national aquatic ecosystem management.

4.3.7 Working for Water Programme (DWA)

The fight against invasive alien plants is spearheaded by the Working for Water (WfW) programme, launched in 1995 and administered through the Department of Water Affairs and Forestry. This programme is based on partnerships between local communities and government departments (including Departments of Environmental Affairs and Tourism, Agriculture, and Trade and Industry, and provincial departments of agriculture), conservation and environment groups, research foundations and private companies. A range of methods are used to control invasive alien plants including mechanical and chemical methods, biological control, and integrated approaches which combine all three. To date 76 biocontrol agents have been released in South Africa against 40 weed species. Since its inception in 1995, the programme has cleared more than one million hectares of invasive alien plants providing jobs and training to approximately 20 000 people from among the most marginalized sectors of society. The programme is globally recognised as one of the most outstanding environmental conservation initiatives on the continent. It enjoys sustained political support for its job creation efforts and the fight against poverty.

4.3.8 Working on Wetlands

As a dry country, but endowed with exceptionally rich biodiversity, South Africa has particular reason to value its wetlands.

Wetlands the world over are widely acknowledged in providing important ecosystem services. In South Africa many wetlands have been degraded or irreversibly lost as a result of human activities. In response to this the departments of Environmental Affairs and Tourism, Water Affairs and Forestry, and Agriculture, together with partners in provincial and local government and civil society, especially the Mondi Wetlands Project, have jointly launched the Working for Wetlands programme. This programme is focussed on the protection, rehabilitation and sustainable use of wetlands. This programme enables its government partners to meet its policy objectives and commitments to several international agreements such as the Ramsar Convention on Wetlands. Funding for the programmes activities is provided by the Department of Environmental Affairs and Tourism to the South African National Biodiversity Institute (SANBI). A guiding principle of the programme is that of raising awareness and influencing behaviour and practices impacting on wetlands, rather than focusing exclusively on engineering solutions. In this light all rehabilitation interventions are undertaken within the context of improving the integrity and functioning of the ecosystem, and include measures that address both causes and effects of degradation.

4.3.9 Working on Fire Programme

The Working on Fire Programme was developed to control wildfires at the lowest possible cost by pooling and deploying resources through a co-ordinated national network. The strength and success of the project are its grassroots partnerships with other firefighting agencies, including conservation agencies, district and local municipalities and the forestry industry. The aim of the WoF Programme is to provide a three year training programme that can supply the nation with well-trained fire fighters and managers to the Forestry Industry, Fire Protection Associations, conservation agencies and local municipalities in the long term, while maintaining an elite veld firefighting corps as a national disaster management resource.

4.3.10 Department of Agriculture: Landcare/ Area wide planning

The Landcare project provides short term employment in the area of land-use supporting activities like farm planning, clearing of alien invasive species and constructing erosion prevention structures in Landcare areas.

4.3.11 The Cape Winelands Biosphere Reserve Section 21 Company

The Cape Winelands Biosphere Reserve (CWBR) 3220km² in extent was registered during September 2007. The CWBR Section 21 Company whom manages the CWBR affairs must ensure that the following functions are met; A conservation function- to contribute to the conservation of landscapes, ecosystems, species and genetic variation; A development function- to foster economic and human development which is socio-culturally and ecologically sustainable; A logistic function-to provide support for research, monitoring, education and information exchange related to local, national and global issues of conservation and development.

4.4 Ecosystem Service: Air Quality

4.4.1 The Cape Winelands District Municipality

The roles and responsibilities of District Municipalities are outlined in the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) (NEM: AQA) as well as the National Framework for air quality management in the republic of South Africa.

SECTION 2

5. CAPE WINELANDS DISTRICT MUNICIPALITY (CWDM) ORGANIZATIONAL STRATEGIC OVERVIEW

5.1 Strategic Objectives

The CWDM IDP (2014) lists the CWDM's top ten strategic risks as:

1. Political Risk;
2. Supply Chain Failure / Disruption;
3. Funding & Good Financial Management;
4. Manage Partnership with other Organisations;
5. Global war for Talent;
6. Climate Change;
7. Aging Infrastructure;
8. Ineffective Communication;
9. Legal & Regulatory Risk; and
10. ICT Infrastructure.

The strategic objectives of the district municipality was developed as a result of the identified risks above which in turn influenced the formulation of pre-determined objectives and projects to either lessor or prevent risks from taking place. Certain risks can be mitigated whereas others need to be managed and monitored to ensure that it does not stem effective sustainable service delivery. The districts strategic objectives have a pro poor focus. This bodes well when considering that poor people will be more vulnerable to the effects of climate change. Dr Louw indicates in the CW DSDF Climate Change Analysis (2007) that In respect of vulnerable people living in urban communities, informal settlements are often located in areas that are subject to floods and other natural hazards. Those people that are least able to adapt or contribute are likely to be the poor.

The CWDM Strategic Objectives (SO) are as follow:

| | Strategic Objective | Predetermined Objective |
|-----|--|--|
| SO1 | To create an environment and forge partnerships that ensures the health, safety, social and economic | <ol style="list-style-type: none">1. Provide a comprehensive and equitable Municipal health Service including Air Quality Management throughout the area of Cape Winelands District Municipality.2. Ensure coordination of multi-disciplinary and sectoral disaster risk reduction through integrated institutional |

| | | |
|-----|---|---|
| | development of all communities including the empowerment of the poor in the Cape Winelands District through economic, environmental and social infrastructure investment. | capacity for Disaster Risk management, Disaster Risk Assessment and Response and Recovery 3. Effective planning and coordination of specialized fire-fighting services throughout the area of Cape Winelands District Municipality. 4. To facilitate environmentally sustainable economic development planning through the development and maintenance of strategic partnerships, investment attraction, retention and opportunities, SMME support and development, skills development and information acknowledgement. 5. To facilitate, ensure and monitor the development and empowerment of the poor by graduating people out of poverty, social inclusion and improving the livelihood of the poor, vulnerable groups, rural farm dwellers and rural communities. |
| SO2 | Promoting sustainable infrastructure services and transport system which fosters social and economic opportunities | 1. To comply with the administrative and financial conditions of the Western Cape Government roads agency function agreement 2. To implement sustainable infrastructure services throughout the area of the Cape Winelands District Municipality. 3. To increase levels of mobility throughout the area of the Cape Winelands District Municipality. 4. To improve infrastructure services for rural dwellers through the area of Cape Winelands District Municipality. 5. To implement an effective ICT support system. |
| SO3 | To provide and effective and efficient financial and strategic support services to the CWDM | 1. To facilitate and enhance sound financial support services. 2. To strengthen and promote participative and accountable governance. 3. To facilitate and enhance sound strategic support services |

5.2 CWDM Climate Change Focus Areas, Interventions and Gaps

The CWDM climate change focus areas are aligned to the Western Cape Climate Change Response Strategy focus areas. A substantial amount of work went into the Western Cape Response Strategy, the focus areas were discussed and work shopped on various platforms and in essence was identified as the critical areas that need intervention within the Western Cape Province.

| KEY CLIMATE CHANGE FOCUS AREAS: |
|---------------------------------|
| 1. Water Security |
| 2. Sustainable Transport |
| 3. Biodiversity Conservation |
| 4. Air Quality Management |
| 5. Waste Management |
| 6. Renewable Energy |
| 7. Safe and Healthy Communities |

5.2.1 Water Security

The CWDM falls within three water catchments namely the Bergriver, Breede and Oliphants/Gouritz River Catchments where water supply is largely insufficient. The impacts of climate change in the district, in terms of precipitation and temperature, will contribute strain to an already water-stressed environment. The climate change projections point towards a drying trend which makes water security a primary concern. Key interventions by the CWDM are as follow;

| PROJECT/ACTIVITY | RESOURCES/INPUT | REPOSIBLE | DURATION |
|---|-----------------|---------------------------------------|----------|
| EPWP Working for Water Programme | R 3 296 000, 00 | Work for Water Section | Annually |
| Cape Winelands Invasive Alien Vegetation Management Programme | R1 030 000, 00 | Land use and Spatial Planning Section | Annually |
| Cape Winelands River Rehabilitation Programme | R360 000, 00 | Land use and Spatial Planning Section | Annually |
| Subsidy: Water/Sanitation on Farms | R1 880 000, 00 | Municipal Health Service | Annually |
| Food –Water Samples and Testing | R1 616 000, 00 | Municipal Health Service | Annually |
| Annual Environmental Health Education Programme | R 425 000, 00 | Municipal Health Service | Annually |
| Water Tanks for Rural Schools | R 849 000, 00 | Technical Services | Annually |
| | | | |

KEY QUESTIONS/GAPS:

The clearing contracts budget decreased substantially from R5 150 000, 00 (2014/2015) to R 3 296 000, 00 (2016/2017) due to a decreased staff contingent. Will the existing staff be able to cope with implementation if a larger budget i.e. R5 150 000, 00 is requested.

5.2.2 Sustainable Transport

Transport is one of the biggest consumers of energy in the Western Cape and uses significant portions of land. This sector has a key role to play in responding to climate change. The response will be realised through promoting sustainable transport options that include promoting the move to public transport, the shift from road to rail freight and the improvement of efficiencies in private vehicles. Large scale changes to the transport sector will take time primarily due to the large costs required for implementation.

Spatial planning plays a key role in transport planning and can strongly support the implementation of sustainable transport interventions, e.g. encouraging developments on existing public transport corridors, car-free developments that put workers close to their place of work and identifying integrated planning opportunities for all necessary goods and services.

| PROJECT/ACTIVITY | RESOURCES/INPUT | REPOSIBLE | DURATION |
|---|-----------------|-----------------------------|-----------|
| Freight Strategy for the CWDM | Completed | Public Transport Regulation | Completed |
| CBD Public Transport Planning: Witzenberg & Langeberg | R1 000 000, 00 | Public Transport Regulation | |
| District Integrated Transport Plan | Completed | Public Transport Regulation | Completed |
| Non-Motorised Transport (Master Planning) | Completed | Public Transport Regulation | Completed |
| Worcester Transport Precinct Plan | Completed | Public Transport Regulation | Completed |
| Integrated Public Transport Network Drakenstein | R1 236 000, 00 | Public Transport Regulation | |

KEY QUESTIONS/GAPS

- District scale plans influencing local SDF's in terms site specific planning.
- The function only exists on a district level.

5.2.3 Biodiversity Conservation

The Cape Floristic Region (CFR) is classified as a "global biodiversity hotspot" by Conservation International and some of the protected areas in the CFR have been given World Heritage status by UNESCO and the International Union for Conservation of Nature (IUCN). The CFR is not only the smallest of the world's floral kingdoms but also has the highest plant diversity; with a high proportion of endemic and threatened Red Data List species (68% of South Africa's threatened species are located in the Western Cape. The Western Cape's biological diversity and natural

resources are under threat from climate change, pollution, overexploitation of natural resources, invasion by alien species and escalating development. It is, therefore, imperative to address these threats and their impacts.

According to the IUCN World Heritage Sites Case Studies (2007) climate change might be the most significant threat facing biodiversity in the Cape Floristic Region over the next 50 to 100 years. The most threatening aspects of climate change to the conservation of the biodiversity of this area are:

- Shrinking of optimal bioclimatic habitats with warming and potential drying;
- Changes in ecosystem structure and composition in response to modification of environmental conditions;
- Increase of fire frequency;
- Impact on freshwater ecosystems (floods and droughts);
- Sea level rise impacting on marine organisms and coastal ecosystems infrastructure (not applicable to the Cape Winelands District);
- Soil biodiversity especially related to soil fertility and the production landscape.

It is thus important for the district to assist in strengthening ecosystem resilience to climate change. Biodiversity conservation is not a primary function of the CWDM but it is influenced through both policy interventions and practical application. The CWDM developed a Strategic Environmental Assessment (2007), District Spatial Development Framework (2011), Draft Environmental Management Framework (pending approval from MEC of the Western Cape Province) and a Cape Winelands Biosphere Spatial Development Framework Plan (2011) which has a strong focus on biodiversity conservation and elements related to biodiversity conservation such as bioregional planning etc. Practical application in terms of biodiversity conservation refers to the clearing of alien vegetation in municipal nature reserves within the CWDM. Key interventions by the district municipality are listed below:

| PROJECT/ACTIVITY | RESOURCES/INPUT | REPOSIBLE | DURATION |
|---|------------------------|---------------------------------------|-----------------|
| Greening Project | R 258 000, 00 | Municipal Health Services | Annually |
| Draft Cape Winelands Environmental Management Framework | Completed | Land use and Spatial Planning Section | Completed |
| CW Invasive Alien | R1030 000, 00 | Land use and | Annually |

| | | | |
|--|-------------------------|---------------------------------------|-----------|
| Vegetation Management Programme-clearing of municipal nature reserves. | | Spatial Planning Section | |
| CW District Spatial Development Framework (2011) Chapter on Biodiversity. | Completed | Land use and Spatial Planning Section | Completed |
| CW Biosphere Spatial Development Framework Plan (2011) | Completed | Land use and Spatial Planning Section | Completed |
| Cape Winelands River Rehabilitation Programme | R 360 000, 00 | Land use and Spatial Planning Section | Annually |
| Cape Winelands Biosphere Reserve Service Level Agreement | R150 000, 00 (annually) | Land use and Spatial Planning Section | Annually |
| EPWP Working for Water Programme | R 3 296 000, 00 | Work for Water Section | Annually |
| Cape Winelands Strategic Environmental Assessment, Environmental Strategy & Strategic Environmental Management Plan (2007) | Completed | Land use and Spatial Planning Section | Completed |
| Firefighting Operations | R10 173 000, 00 | Fire Services | Annually |

KEY QUESTIONS/GAPS:

- The only policy that have the legislative “grunt” to influence the prevention of clearing of pristine natural areas are the Draft Cape Winelands Environmental Management Framework which has been submitted to the MEC for approval on 19 February 2013. The document has been referred back to the CWDM during 2015 after nearly three years of being submitted to the MEC for approval. The reason for the latter is that the CWDM need to amend the updated 2014 EIA Regulations. DEADP also encouraged the CWDM to approve the document in house as a policy that would act more as a guiding document.

5.2.4 Air Quality Management

The roles and responsibilities of District Municipalities are outlined in the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) (NEM: AQA) as well as the National Framework for air quality management in the republic of South Africa.

Based on the available ambient air quality monitoring data and the emissions inventory compiled for the District, air pollution priority areas or ‘hotspots’ were identified in the District. Emphasis was placed on areas with high population

densities and the spatial distribution of sources in relation to residential areas. Given that PM10 (Parts per Million smaller than ten microns) concentrations have been identified to be the main pollutant of concern in the District; the focus was on areas where PM10 was identified to be of significance.

Based on the above-mentioned criteria, these areas have been identified to be: Paarl and Wellington (Drakenstein Local Municipality) Preliminary continuous monitoring data indicates elevated PM10 concentrations in these areas.

Worcester (Breede Valley Local Municipality) – This Local Municipality accounts for approximately 34% of total PM10 emissions in the District. Emissions from industries were identified to be significant in this area.

In addition the town of Stellenbosch within the Stellenbosch Local Municipality is also identified to be a potential 'hotspot' area. The Cape Town Brown Haze II Study in 2003 was an airborne research campaign to analyse the brown haze, which hangs over Cape Town during the winter months. Although the highest concentrations occurred over the Cape Town Metropolitan Area, Stellenbosch was identified to be an area of interest in terms of the aerosol (particulate) concentrations recorded in this area.

Potential air pollution sources in the Cape Winelands have been identified as:

- Industrial operations;
- Agricultural activities;
- Biomass burning (veldt fires);
- Domestic fuel burning (particularly, wood and paraffin);
- Vehicle tailpipe emissions;
- Waste treatment and disposal (landfills and incineration);
- Vehicle entrainment of dust from paved and unpaved roads; and
- Other fugitive dust sources such as wind erosion of exposed areas.

Key interventions by the district municipality are listed below:

| PROJECT/ACTIVITY | RESOURCES/INPUT | REPOSIBLE | DURATION |
|--|----------------------|---------------------------|----------------------|
| Air Quality Management Plan (AQMP) | In process of review | Municipal Health Services | In process of review |
| Air Quality Capital Project | R50 000, 00 | Municipal Health Services | Ongoing |
| Atmospheric Emissions Licensing of listed activities | ongoing | Municipal Health Services | Ongoing |

KEY QUESTIONS/GAPS:

- The division of roles and responsibilities between local and district municipalities are not clearly understood or has not been accepted by certain local municipalities and this hampers cooperative governance and the implementation of the function;
- Not all Local Municipalities have appointed Air Quality Officers and this hampers communication and accountability;
- Air Quality management requires cooperation from various disciplines within local government which includes amongst others, traffic, town planning, environmental services, cleansing services, housing, building control, Municipal Health Services, Law enforcement, social and developmental services and political buy in. The successful implementation of an air quality management plan is thus strongly dependent upon cooperation and communication amongst all the local governments within the district. This has always been an area of concern within the district and is expected to be a major challenge in the implementation of this function throughout the district;
- Inadequate financial provision specifically earmarked for AQM by certain local authorities within the district; and
- The availability of suitably skilled human resources also remains a challenge.

5.2.5 Waste Management

Waste decomposition is responsible for a proportion of the total Green House Gas emissions for the Western Cape. Waste is also a source of health risks, water contamination and creates blockages in the drainage network, which exacerbates climate risks. Therefore, waste minimization and management is a key adaptation measure.

Council is currently in the process of completing a second generation Integrated Waste Management Plan (IWMP) for the district as a whole. Most of the local municipalities have completed or are in the process of completing their own IWMP and in combining these plans into one strategic document, a holistic view of waste management in the district can be obtained. Through this, management issues of a district nature can be identified, investigated and implemented. The IWMP is a

statutory requirement of the National Environmental Management: Waste Act (Act No. 59 of 2008) that has been promulgated and came into effect on 1 July 2009. This Plan is borne out of the requirements of the National Waste Management Strategy and forms the first action plan in terms of this strategy.

The IWMP will underline the following principles of the National Waste Management Strategy:

- The prevention of waste generation;
- The recovery of waste of which the generation cannot be prevented; and
- The safe disposal of waste that cannot be recovered

The Plan will address all areas of waste management – from waste prevention and minimization (waste avoidance), to its collection, treatment, recovery and final disposal. It will not only address the practicalities of waste management, but also the issues of public education and changing concepts, as these are vital to a successful management system.

Witzenberg, Breede Valley and Langeberg municipality's area is in critical need for landfill airspace. To address this critical shortage, the CWDM embarked on the identification and licensing of a regional landfill site. The landfill site in the Breede Valley municipal area in close proximity to Worcester was identified. The environmental process has been completed, with the licensing process being the only holdup due to objections. The district municipality's response is as follow:

| PROJECT/ACTIVITY | RESOURCES/INPUT | REPOSIBLE | DURATION |
|---------------------------------------|-----------------|--------------------|----------|
| Development of Regional Landfill Site | R103 000, 00 | Technical Services | Ongoing |

KEY QUESTIONS/GAPS:

- Does Engineering and Infrastructure Services consider green technologies/alternative methods that are environmentally friendly?
- Can engineering influence waste management in terms of promoting recycling etc.

5.2.6 Renewable Energy

According to the Western Cape Government, renewable energy is a key area of focus and forms a fundamental component of the drive towards the Western Cape becoming the green economy hub for Africa.

The Western Cape Government indicated that they have a role to play in supporting the development of the renewable energy industry. Waste-to-energy opportunities in the Western Cape are being further investigated by them in order to facilitate large scale rollouts. This includes understanding the most appropriate technologies for waste-to-energy projects as well as developing decision support tools for municipalities to implement waste-to-energy programmes. It is clear that the Western Cape Government is taking the lead in this key priority area and will assist municipal efforts. A key intervention by the district municipality is as follow:

| PROJECT/ACTIVITY | RESOURCES/INPUT | REPOSIBLE | DURATION |
|---|-----------------|--------------------|----------|
| Renewable infrastructure within Rural Areas-Solar Systems | R2 000 000, 00 | Technical Services | Annually |

KEY QUESTIONS:

- Is there a conflict between rendering a service in terms of selling electricity and facilitating a resilient community that uses green technologies i.e. solar panels. Can the CWDM Engineering Services influence this conflict if necessary?

5.2.7 Safe & Healthy Communities

Proposed priority areas for the district municipality are: Environmental Health Services, Food Security, Flooding, Health Care and Firefighting.

5.2.7.1 Environmental Health Services

The Cape Winelands District Municipality provides a comprehensive environmental health service through its Municipal Health Services Division. The primary objective of this service is to protect and enhance the health, safety and wellbeing of all residents residing within the boundaries of the CWDM.

Municipal Health Services includes the following:

5.2.7.1.1 Water Quality Monitoring

- (i). Monitoring water reticulation systems for compliance with health requirements.
- (ii). Monitoring quality and availability of water intended for human consumption, recreation or industrial use.
- (iii). Regular water sampling.
- (iv). Identification and control of sources of water pollution.
- (v). Protection of water sources and resources through the enforcement of laws, regulations and bylaws.
- (vi). Ensure that water supplied for human consumption is safe and that it complies with the Water Services Act.
- (vii). Implementation of health and hygiene awareness actions and education relating to water supply and sanitation.

5.2.7.1.2 Food Control

- (i). Food compliance inspections at the point of production, storage, distribution and consumption.
- (ii). Compliance monitoring of food premises in relation to hygiene and the prevention of nuisances.
- (iii). Regulate the informal food industry.
- (iv). Monitor and control food premises through the issuing of Certificates of Acceptability.
- (v). Monitor and control the labelling of foodstuffs as prescribed by law.
- (vi). Ensuring food safety.
- (vii). Enforcement of food related legislation.

5.2.7.1.3 Waste Management

- (i). Monitoring of waste management systems, including health care waste, hazardous waste and waste water.
- (ii). Monitoring the storage, treatment, collection, handling and disposal of various categories of waste.
- (iii). Through the enforcement of laws, regulations and bylaws and in liaison with other partners.

5.2.7.1.4 Surveillance of Premises

- (i). The identification, monitoring and evaluation of environmental health risks, - nuisances and – hazards.
- (ii). The prevention and rehabilitation of any condition on any premises that may be hazardous to the health or wellbeing of people or pollution detrimental to health.
- (iii). Through the enforcement of laws, regulations and bylaws and in liaison with other partners.

5.2.7.1.5 Surveillance & prevention of Communicable Diseases, excluding Immunisation

- (i). The identification, investigation and monitoring of outbreaks of any contagious disease.
- (ii). The introduction of the required corrective and preventative measures
- (iii). The promotion of health and hygiene aimed at preventing the incidence of environmental conditions that will result in contagious diseases
- (iv). The collection, analysis and dissemination of epidemiological data and information

5.2.7.1.6 Vector control

- (i). The elimination or correction of conditions promoting the habits and breeding habits of vectors
- (ii). Developing awareness in communities of zoonotic diseases by means of vectors and the control thereof through education and training

5.2.7.1.7 Environmental Pollution Control

- (i). The identification, evaluation, monitoring and prevention of the pollution of: Soil, Water and Air.
- (ii). Promoting environments that are conducive to the safety, health and wellbeing of all who resides therein.
- (iii). Identification of polluting agents and their sources.

- (iv). Promoting healthy and environmentally friendly development.
- (v). Educate and train communities regarding environmental pollution
- (vi). Through the enforcement of laws, regulations and bylaws and in liaison with other partners.

5.2.7.1.8 Safe handling of Chemical Substances

- (i). The monitoring, identification, evaluation and prevention of risks relating to chemicals hazardous to humans (e.g. storing and using agricultural substances)
- (ii). The education and training of high-risk groups and communities in the safe use and handling of chemicals.

5.2.7.1.9 Disposal of the Dead

- (i). The monitoring and certification of funeral undertakers, mortuaries, embalmers, crematoria, graves and cemeteries and to manage, control and monitor exhumations and reburial or disposal of human remains

5.2.7.2 Food security

Food security in terms of climate change can be defined as the ability of the agricultural sector ensuring that food production is not affected to the point of relying solely on importing food. This is not a function of the CWDM although funding is provided to assist small scale farmers on an annual basis as part of a local economic development initiative. Interventions will therefore have to be well developed in consultation with the National Department of Agriculture. The lack of funding/budget and capacity could otherwise limit the CWDM's involvement in this priority area.

5.2.7.3 Disaster Management and Fire Services

The National Disaster Management Act sets a solid regulatory basis for efficient and effective responses. The Cape Winelands district complies with all the legislation of the above-mentioned act. A Disaster Risk Center was constructed in Worcester due to centrality and existing health care thresholds. The command center is crucial to effective Disaster incidence response coordination and forms the A brief overview of

the district's general capacity to cope is as follow. For fire and emergency incidents, the fire brigade is the first line of response. There are 5 district fire depots and 11 municipal stations that fall under the jurisdiction of the 5 local municipalities. The district and local municipalities have a mutual agreement to support each other as need be. This support system is further augmented with the participation of some rural farmers who have been supplied with basic firefighting gear to assist in rural areas. In addition, the Working on Fire programme also supports fire incidents upon request from the district municipality. There are also helicopters that are on standby during the high risk season and are also used in the case of severe fires.

5.2.7.4 Health Care

Provincial government provides emergency medical and rescue services (EMS), with dispatch units in every district. The Cape Winelands dispatch unit is located in Worcester and has 40 ambulances, 3 response and 5 rescue vehicles. In 2007, there were improvements in EMS service delivery - response time was reduced by 50% and time taken to admit patients to hospital decreased from 90 to 20 minutes (Louw, 2007). The 83 public health care (PHC) facilities within Cape Winelands comprise of 5 community day centres, 44 clinics, 7 satellite clinics, 27 mobile clinics, 4 district hospitals and 2 regional hospitals. Within the Cape Winelands District, Drakenstein Municipality has the largest number of PHC facilities at 27, followed by Breede Valley at 19, Witzenberg at 17, Langeberg at 14 and Stellenbosch Municipality at 12. Cape Winelands District furthermore has 10 ambulance facilities located across the region with 2 in Witzenberg, 1 in Drakenstein, 1 in Stellenbosch, 3 in Breede Valley and 3 in Langeberg.

5.2.7.5 Flooding

Climate change may result in a change in the frequency and magnitude of extreme rainfall events. This, coupled with land-use changes in catchments (urbanisation and increased agriculture), will likely result in increased flood impacts along and adjacent to river courses of the District Municipal Area. This should be considered in making land-use decisions that relate both to residential developments along river courses and practices in upper catchment areas. In particular, attention should be given to the prevention of development within the 1

in 100 year flood-lines. The local municipalities that constitute the district municipality is responsible for land use planning and will have to indicate in their individual Spatial Development Frameworks which is site specific in nature that development in the river catchment areas and under the 1:100 year flood line will not be allowed.

Key interventions by the CWDM are as follow:

| PROJECT/ACTIVITY | RESOURCES/INPUT | REPOSIBLE | DURATION |
|---|--------------------|----------------------------|----------|
| Disaster Management Plan | Completed | Disaster Management | |
| Food-Water Samples and Testing | R 1 616 000, 00 | Municipal Health Services | Annually |
| Subsidy water/sanitation-Farms | R1 880 000, 00 | Municipal Health Services | Annually |
| Annual Environmental Health Educational Programme | R425 000, 00 | Municipal Health Services | Annually |
| Firefighting Operations | R10 173 000, 00 | Fire Services | Annually |
| Storm water Master Plan | R600 000, 00 | Technical Services | Annually |
| Environmental Health Monitoring | Operational budget | Municipal Health Services | Annually |
| Disaster Management | Operational budget | Disaster Management | Annually |
| Small Scale Farmers | R500 000, 00 | Local Economic Development | Annually |

KEY QUESTIONS/GAPS:

- Disaster Management Plan needs to be reviewed due to a growing population.

6. The way forward:

The Framework for a Draft Climate Change Response Strategy is a "living document". The tables in Section 2 implicating projects and resource input need to be amended each year with the CWDM budget. Departments are requested to consider this framework with specific reference to the "key climate change focus areas: *water security, sustainable transport, biodiversity conservation, air quality management, waste management, renewable energy and safe and healthy communities* during their project planning phase.

Contact Person: Quinton Balie Pr. Pln(A/1831/2014)

Contact Details: 021 888 5194

E-mail address: quinton@capewineland.gov.za

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