

National Climate Change Information System

Integrating Data and Decision-Support



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA



**science
& technology**

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



CONTEXT



- In South Africa, climate-related disasters over the last four decades have resulted in approximately US\$5 billion in economic damages (Davis-Reddy et al., 2019 GreenBook)
- The country is projected to face a higher frequency of climate related disasters that are increasing in intensity, and these events are likely to be associated with impacts that are on par with, if not worse than those already experienced (Engelbrecht et al. 2018 Third National Communication to UNFCCC)
- Creating an enabling environment for both climate change adaptation and disaster risk management is critical to ensure future resilience

BACKGROUND

- Proper monitoring and reporting of climate change mitigation and adaptation data requires a coherent system of data collection within the National, Provincial and Municipal administrative structures.
- NDP: “the government needs to build capacity to effectively administer the monitoring, reporting and verification systems, supported by the participation of industry and other stakeholders” (RSA, 2012: p208).
- NCCRP: "South Africa needs a country-wide monitoring system to measure climate variables at scales appropriate to the institutions that must implement climate change responses" (DEA, 2011: p.6).

BACKGROUND

- In partnership with the Department of Environmental Affairs (DEA), the South African Environmental Observation Network (SAEON) is developing a series of decision support tools for climate change adaptation, monitoring and reporting.
- The work done to date by SAEON fits into a wider framework aimed at systematically transforming a wide variety of systems and initiatives into an integrated, modular system of systems.

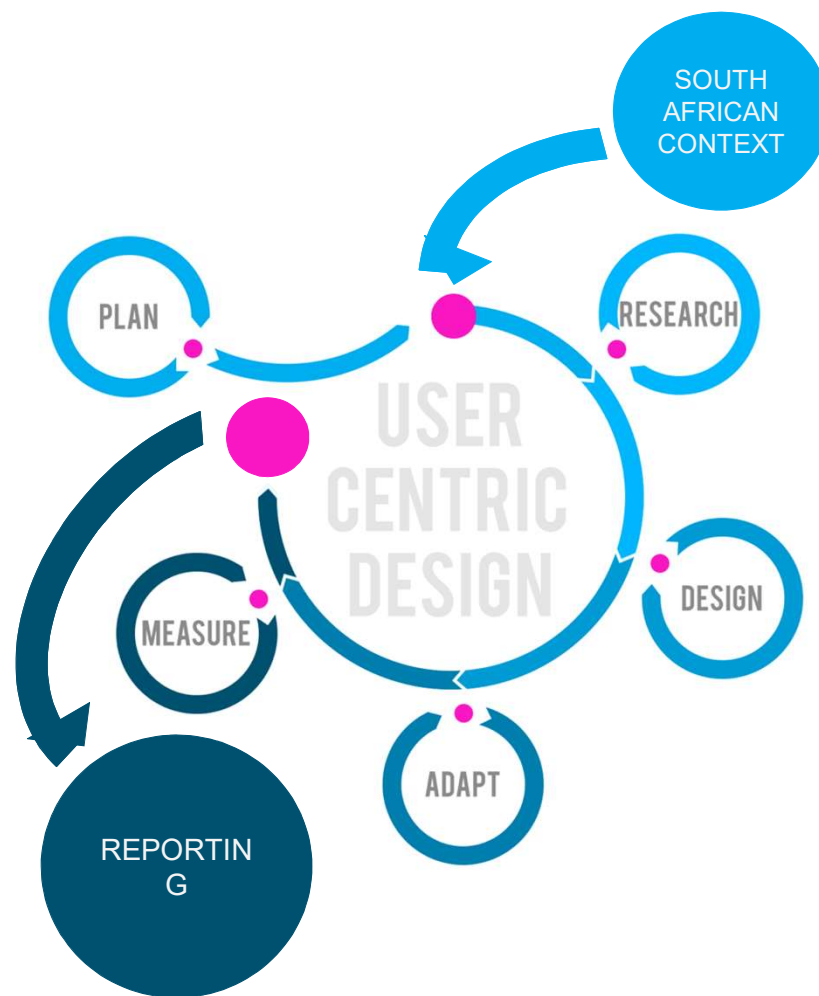
SOLUTION DESIGN

SAEON is building the Climate Change Information System. A web-based platform that:

- collates data from a range of sources for the purpose of specific reporting formats; and
- integrates systems commissioned by Department of Environmental Affairs (DEA), from SAEON, and from other stakeholders, locally and abroad.

The information will be used to populate the national Climate Change Report, UNFCCC reporting, GHG Inventory and others.

A user centered design approach - an iterative **design** process in which designers **focus** on the **users** and their needs in each phase of the **design** process



National Climate Change Information System

About

The NCCIS is a first step towards development of an open source, standards-based, and integrated portfolio of systems that aims to eliminate duplication of effort, limits multiplication of data sources, and is re-usable on many levels of government in South Africa.

Purpose

The system monitors and evaluates climate change drivers, events, links to national objectives, targets and strategies in respect of climate change mitigation and adaptation monitoring and assessment of actions taken by stakeholders.

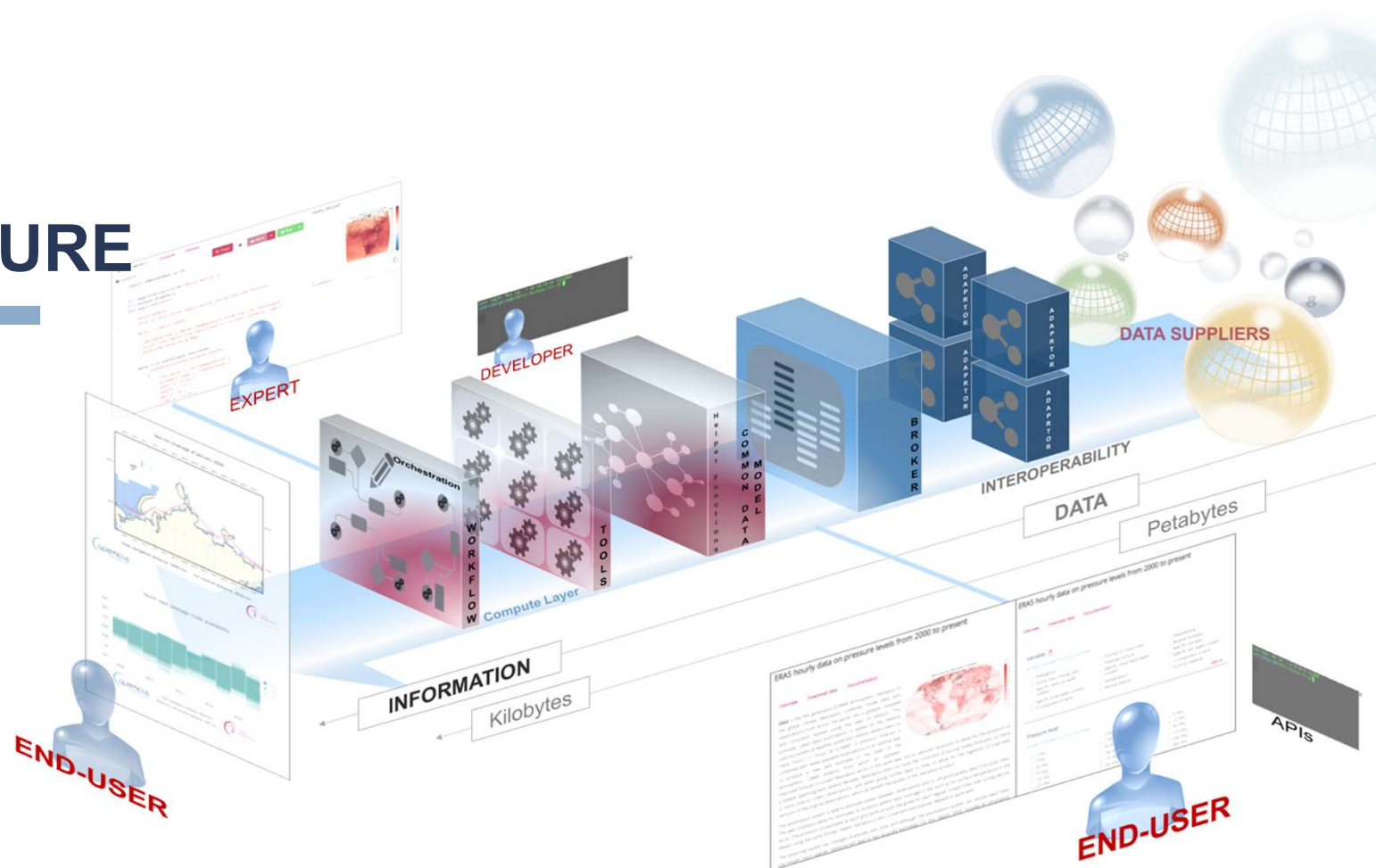
National Reporting on Climate Change

The NCCIS is part of the national effort to track South Africa's overall transition to a low carbon and climate resilient economy as required by the National Development Plan (Vision 2030) and the National Climate Change Response Policy (2011) as well as the South Africa's Nationally Determined Contributions (NDC 2015) to the United Nations Framework Convention on Climate Change (UNFCCC). Climate change transparency is at the heart of the Paris Agreement and as such South Africa, along with other countries will need to enhance reporting on climate actions and their effects.

SYSTEM REQUIREMENTS

- The system should be able to collect data in a standardised way that is typical for the climate change field and the South African context
- Using that common frame of reference, global change resources – including datasets and services, static content, references to documentation and reports, and other digital objects, with specific collections (e.g. LRT) should be easy to search and discover
- It should be capable of being modified by DEA and relevant parties as the context changes and new information is added
- It should contain a portfolio of online Atlases, including thematic atlases such as the Climate Change Atlas and the Carbon Sinks Atlas
- It should integrate systems that assist with gathering data needed for reporting (e.g. GHG emissions), hazardous events (NHEDB), and mitigation and adaptation actions (e.g. NCCRD).

SYSTEM ARCHITECTURE



CDS Toolbox concept (credit: Copernicus Climate Change Service)

SYSTEM ARCHITECTURE

Vision

- Distributed, federated system of systems based on agreed data and metadata standards and specifications.
- Broadening of the concept of the National Framework for Climate Services (NFCS).
- Multiple-level implementation with re-usable code, embeddable components, and configurable services or applications.
- Large variety of data sources - distributed as required by data providers and formal sources.
- Scalable, extensible, single source of truth

SYSTEM ARCHITECTURE

The following levels of external integration are possible:

1. **Data-level integration:** Province/ Local Authority develops its own system, but exchanges data with DEA via interoperable services and using specified vocabularies.
1. **Code-level integration:** Province/ Local Authority develops its own fork of DEA open source components, by definition these exchange data via interoperability services and uses the designated vocabularies.
1. **Component-level integration:** Province/ Local Authority embeds components hosted by DEA into their own systems. Interoperability and vocabulary implementation is implicit.
1. **Configured instances:** A subset of data and resources is configured and branded for a Province/ Local Authority, with systems hosted by DEA.

DATA SOURCES

**Public and Private Databases and Services,
systems, and web-based resources**



GHG/ Pollutants Budgets, Monitoring, Targets

Hazardous and Disastrous Events Monitoring and Impact Assessments

Climate Change Impact, Risk and Vulnerability

Mitigation and Adaptation Options, Projects, Funding

Technology Needs and Climate Finance

Indicators

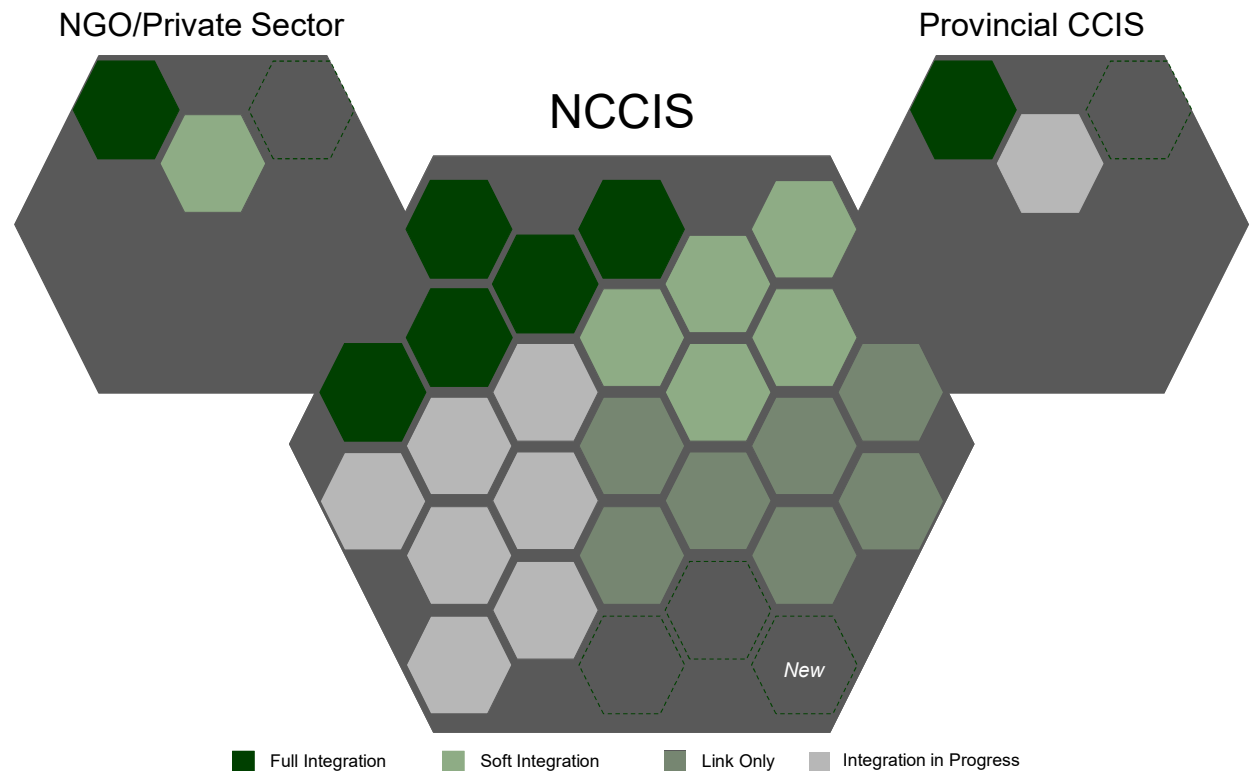
Resources - Reports, Policies, Studies, Research

COMPONENTS

A Data Services Ecosystem

NCCIS is composed of building blocks and key elements to identify specific aspects of climate resilience for direct monitoring and evaluation.

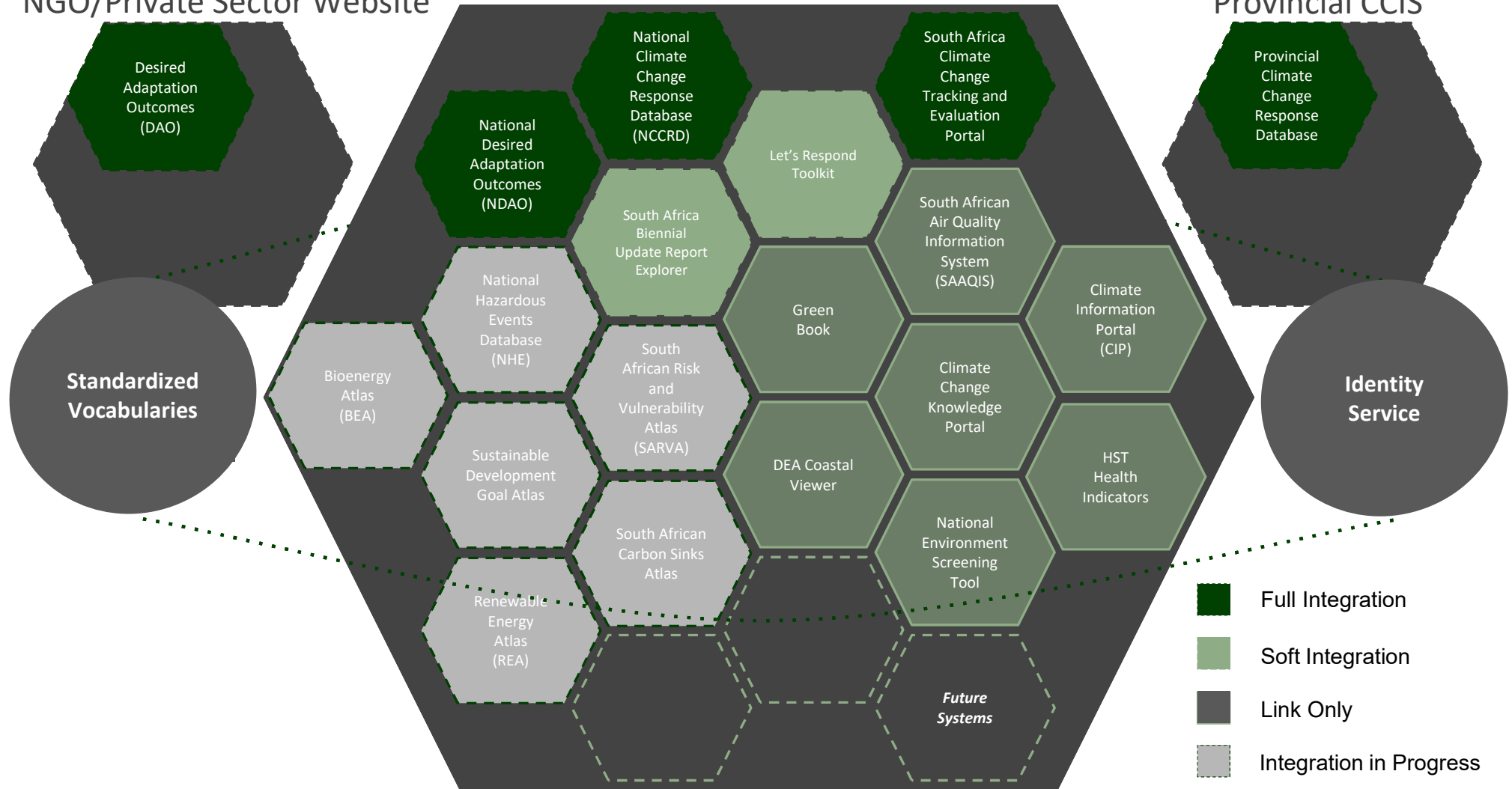
Each service plays a specific role in the ecosystem with data feeding in at different points from different elements to inform the whole.



NCCIS

NGO/Private Sector Website

Provincial CCIS



Complimentary Systems

1

GREENBOOK

- Vulnerability profiles of settlements of SA
- Adaptation action framework and options

2

NDMC

The information required on hazardous events is coordinated and managed by the National Disaster Management Centre (NDMC)

3

SARVA

Visualisation of vulnerability and exposure to environmental hazards within a particular location, through spatial and non-spatial data and information.

4

RENEWABLE ENERGY ATLAS

- Data sources (e.g. fuel wood usage, access to energy, land cover change, rate of urbanisation)
- Feasibility-tested options

5

SDG ATLAS

- SDG indicator data and reporting available at a high resolution to municipal planners
- Establishment of an SDG indicator atlas that aligns with national reporting to the UN and thus a single source of truth

6

SAWS

- WMO Extreme climate indices, updated on an annual basis, will become available in 2020 on the SAWS website.
- Publication of an annual State of the Climate report on the SAWS website.

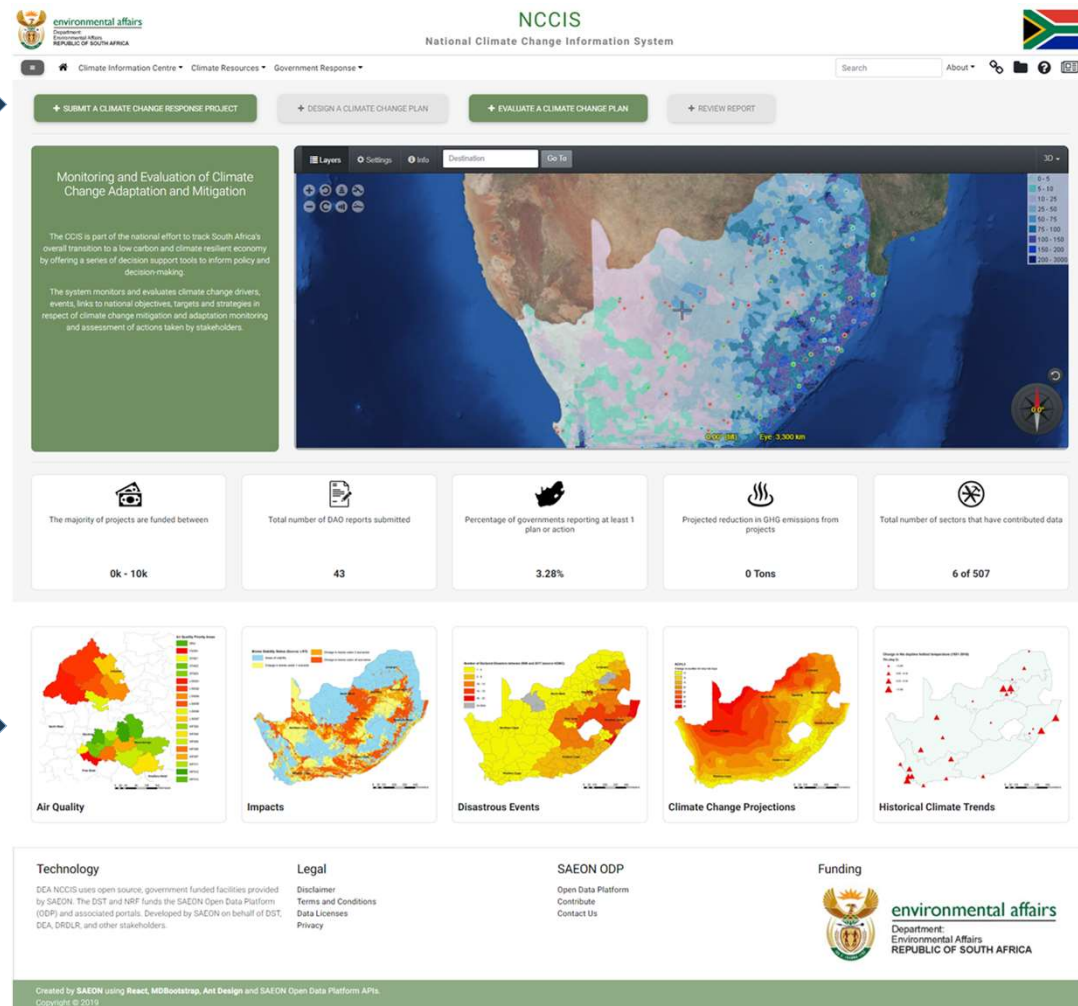
NCCIS DASHBOARD

Action-driven
navigation

Interactive
Atlas

Filterable summary
of facts and figures
from across all
systems

Summary maps
and resources
covering the scope
of the NCCIS



Action-driven
navigation

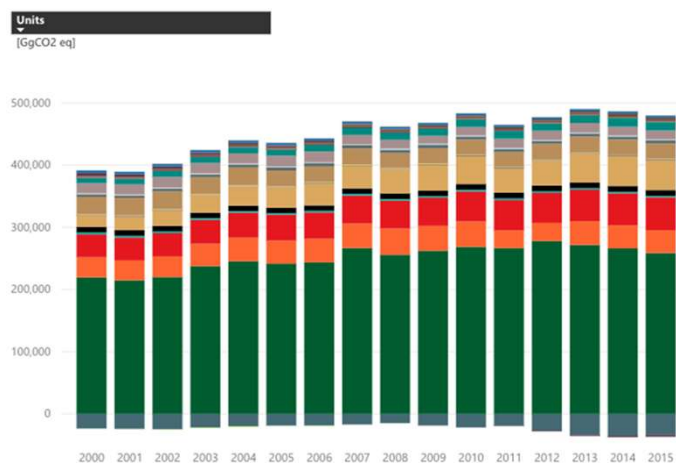
SITE MAP

- ▶ Climate Information Centre
- ▶ Climate Resources
 - Gouvernement Response
- ▶ Submit a climate change response project
- ▶ Design a climate change plan
- ▶ Evaluate a climate change plan
 - Review Report

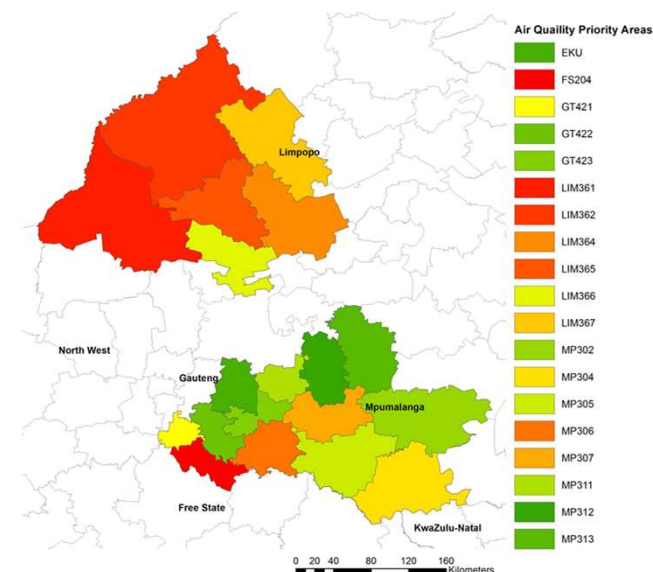
CLIMATE INFORMATION CENTRE

Explore GHG and air quality data, historical and projected climate data, climate information by province, and key vulnerabilities and impacts.

GHG EMISSIONS DATABASE: T&E PORTAL



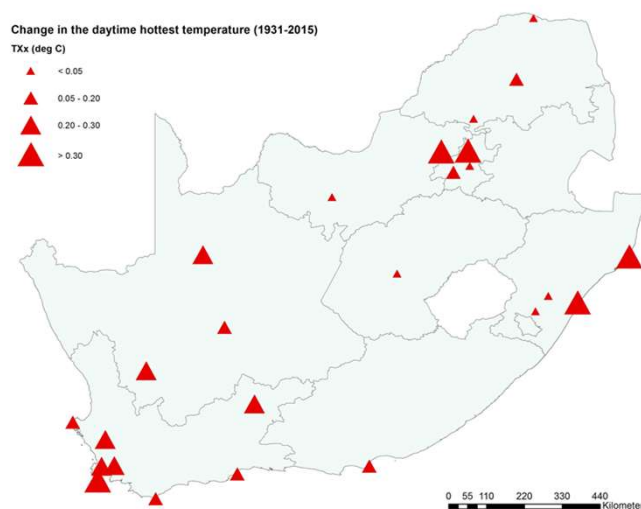
AIR QUALITY: SAAQIS



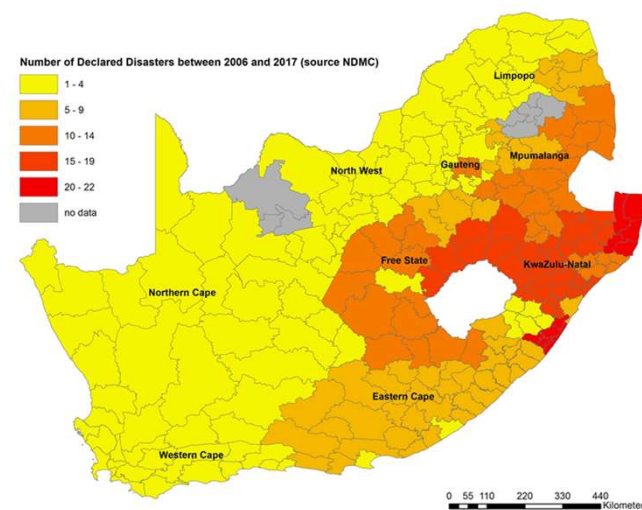
CLIMATE INFORMATION CENTRE

Explore GHG and air quality data, historical and projected climate data, climate information by province, and key vulnerabilities and impacts.

HISTORICAL CLIMATE TRENDS: SAWS



HAZARDOUS EVENTS: NDMC

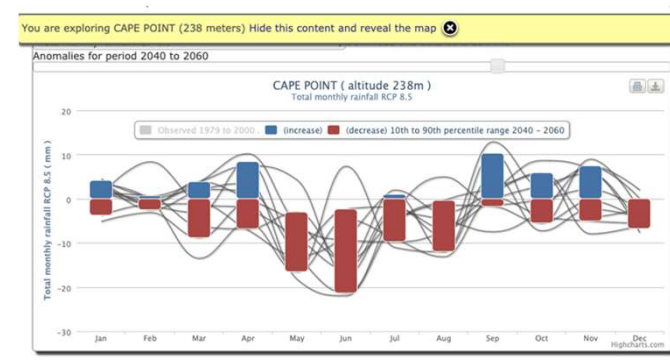
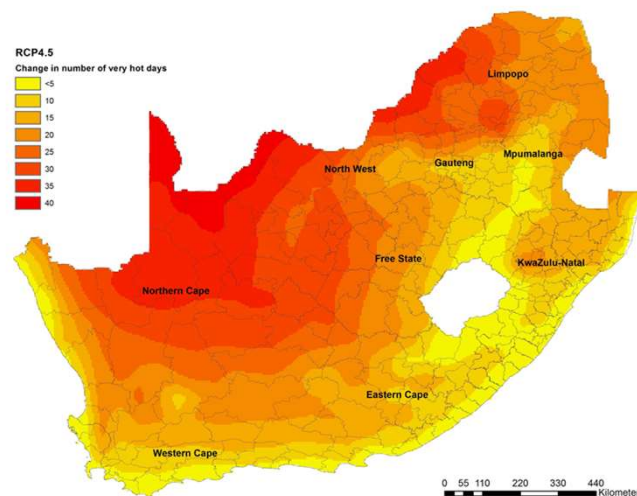


CLIMATE INFORMATION CENTRE

Explore GHG and air quality data, historical and projected climate data, climate information by province, and key vulnerabilities and impacts.

CLIMATE CHANGE PROJECTIONS:

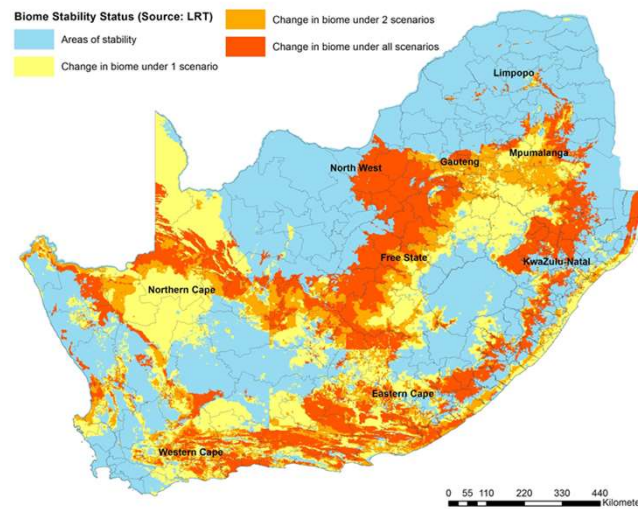
CLIMATE CHANGE PROJECTIONS:



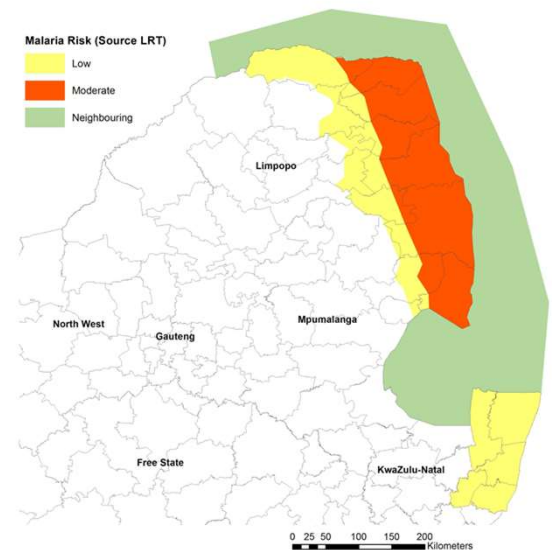
CLIMATE INFORMATION CENTRE

LET'S
RESPOND
TOOLKIT

CLIMATE CHANGE IMPACTS: EXAMPLE LRT



RISK AND VULNERABILITY: EXAMPLE LRT



CLIMATE CHANGE RESOURCES AND LINKS



Tools



Events and News



Glossary



Reports



Tracking and
Evaluation
Documentation



Policy and Legislation



Guidelines



Spatial Planning



International Reports

+ SUBMIT A CLIMATE CHANGE RESPONSE PROJECT




NCCRD

NATIONAL CLIMATE CHANGE RESPONSE DATABASE


- The NCCRD is a portal for capturing and reporting climate change projects and their details. Each project can have any number of adaptation or mitigation actions, which are the individual actions under the main project.
- The NCCRD also offers modern reporting capabilities with maps, charts, summary views and more to document and describe the technical and financial feasibility of an action, the projected reduction of greenhouse gases for each action, actions to address specific climate change hazards, the amount of funding going into different action types, and how many actions different industrial sectors are contributing to the database.
- The NCCRD is one of the core components of the NCCIS and serves as an entry point for reporting from bottom up and from the top down on South Africa's efforts towards combating climate change and its impacts.
- The NCCRD ties directly into the National Desired Adaptation Outcomes Questionnaire (NDAO). Any climate change plan can be linked to a NDAO entry or vice versa.

+ SUBMIT A CLIMATE CHANGE RESPONSE PROJECT



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Department:
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REPUBLIC OF SOUTH AFRICA

NCCRD BETA
National Climate Change Response
Database



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+ ADD NEW PROJECT

Monitoring and Evaluation ▾

Dashboard

Title

Region

Sector

Hazard

Status

Typology

Search...

Select...

Select...

Coming S...

Select...

Select...

Projects

DOWNLOAD

!!!Khwa Ttu Land Rehabilitation and Education Project

Khwa Ttu is situated in 840 ha of ecologically sensitive land that has, in the past, been utilized for wheat farming. As rehabilitation was never done on the land after the land stopped being used for agriculture, a number of ...

VIEW

EDIT

FAVOURITE

DOWNLOAD

"EDUCATOR SERIES" with the Media, Rural-based newspapers and Radio in KwaZulu-Natal, Limpopo, Norht

The Project seeks to create awareness about the SGP and all related components and also to educate rural communities about the primary nature conservation problems. The project will use community radio/local newspapers as a v ...

VIEW

EDIT

FAVOURITE

DOWNLOAD

#Busby Renewables Project

Business Travel for the employees of the company to be able to meet and see the necessary contractors and suppliers.

VIEW

EDIT

FAVOURITE

DOWNLOAD

Current Filters

No Filters Applied.

Map



FUNDED PROJECTS



CO2 REDUCTION



+ SUBMIT A CLIMATE CHANGE RESPONSE PROJECT

NCCRD

Each project in the database is broken down into:

- general project overview
- description of the funding provided for the project, and
- details of specific adaptation and mitigation actions taken in the project.

Each action is separated into applied or research: research options are studies to test some aspect of action implementation whereas applied projects can be implemented or rolled out directly at a variety of scales.



+ DESIGN A CLIMATE CHANGE PLAN

LET'S
RESPOND
TOOLKIT

COMING SOON TO NCCIS
Part 2 Integration (Dec 2019)

RISK AND VULNERABILITY ASSESSMENT

- Updated review and best practise guidelines
- LRT Risk and Vulnerability Framework and Procedure
- Additional tools: SARVA and GreenBook

STAKEHOLDER ENGAGEMENT

- Guidelines on how to conduct stakeholder engagement
- Participatory approaches

PLANNING INTEGRATION

- Climate change support checklists
- Guidelines on how to integrate climate change into planning
- Guidelines on how to use climate change projections and deal with uncertainty

+ EVALUATE A CLIMATE CHANGE PLAN

International climate change adaptation-related agreements

South Africa is subject to a number of international environmental agreements, some of which require reporting on climate change adaptation, as outlined below.

Paris Agreement and A-NDC goals

SDG targets and indicators

UNCCD expected impacts and indicators

UN Habitat focus areas and strategic results

Sendai targets

South African Context

+ EVALUATE A CLIMATE CHANGE PLAN



COMPLETED
SYSTEM

Desired Adaptation
Outcomes (NDAO)

FORTHCOMING SYSTEMS AND CONTENT



Desired Mitigation
Outcomes



Indicators



Sustainable
Development Goals



Other policy
documentation

+ EVALUATE A CLIMATE CHANGE PLAN

NATIONAL DESIRED ADAPTATION OUTCOMES

The NDAO questionnaire is a component of the larger NCCIS designed as a monitoring and evaluation framework for climate change resilience by a variety of stakeholders through progress towards a series of goals.

GOALS

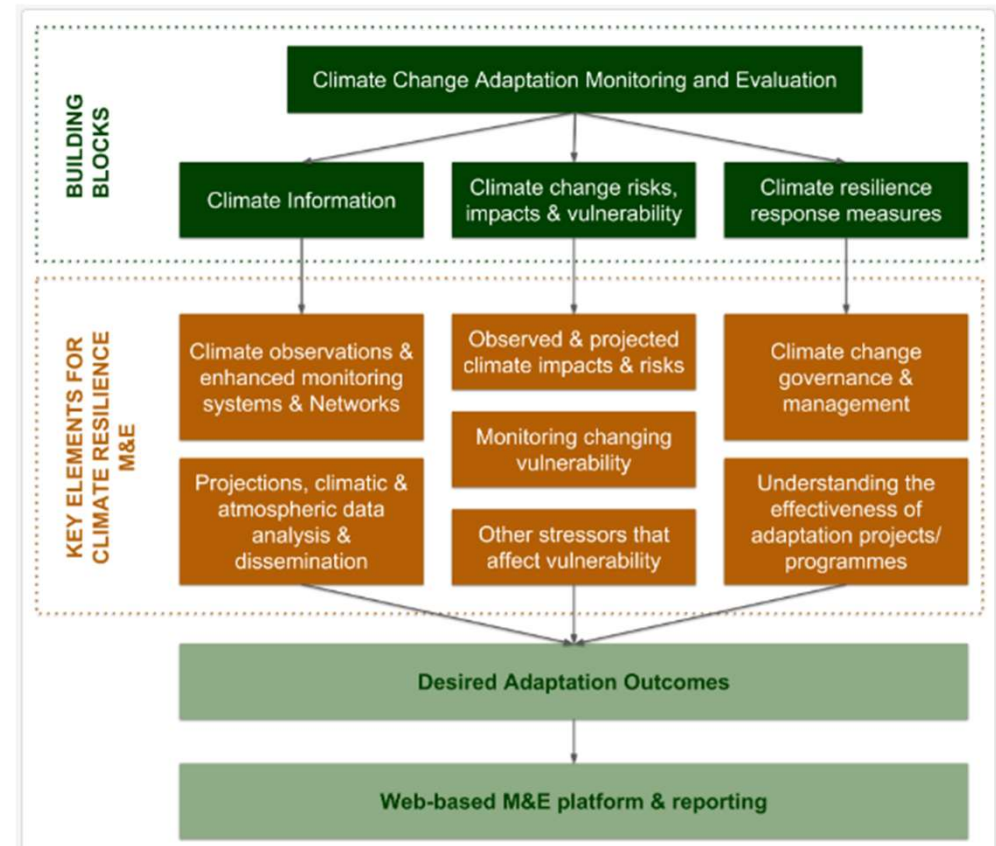
G1-G6: monitor and evaluate the ***inputs needed*** (e.g. processes, resources and capacities) to enable effective climate change adaptation.

G7-G9: monitor and evaluate the ***key impacts*** desired of adaptation interventions and associated measures (e.g. reductions in vulnerability of human- and natural-systems).


+ EVALUATE A CLIMATE CHANGE PLAN

NDAO

Inputs considered to inform the NDAO questionnaire goals




+ EVALUATE A CLIMATE CHANGE PLAN



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NDAO BETA
 National Desired Adaptation Outcomes



Home
Adaptation M&E
Amelia Hilgart Logout

Monitoring and Evaluation of Climate Change Adaptation

The Department of Environmental Affairs National Desired Adaptation Outcomes (NDAO) was designed to monitor and track South Africa's progress on climate change, to that end, nine desired adaptation outcome goals were developed to establish progress across the country. Where do you stand?

[Submit your Contribution](#)

Climate Change Adaptation Status Across South Africa

A simple pragmatic approach has been developed to monitor and evaluate the progress being made in achieving individual desired adaptation outcomes using traffic light colours as a scoring system to summarise progress.

RED indicates that no or only preliminary work has begun towards a goal, **AMBER** indicates that significant progress is being made towards a goal, and **GREEN** indicates that work on a goal is in an ideal state.

[More Information...](#)
[DOWNLOAD DAO DATA](#)
[SUBMIT YOUR CONTRIBUTION](#)

Region (National)
 Sector (Any)
 Organisation/Institution (Government)

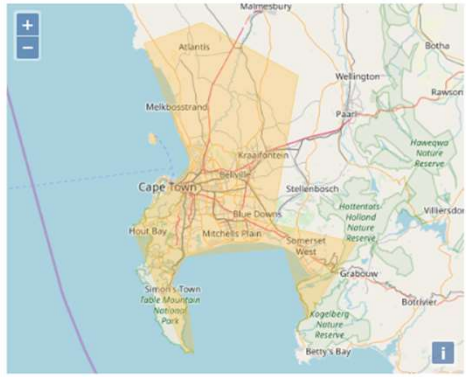
Goal-1: Plans, policy and actions
 Year: 2019
 [CLEAR FILTERS](#)

Goal Details

Goal 1. Robust/integrated plans, policies and actions for effective delivery of climate change adaptation, together with monitoring, evaluation and review over the short, medium and longer-term.

	2015	2016	2017	2018	2019	2020
1					GREEN	
2					RED	
3					RED	
4					RED	
5					RED	
6					GREEN	
7						
8						
9					RED	

Map




Desired Adaptation Outcome Questionnaire

Climate Change Adaptation Monitoring and Evaluation

[About this platform...](#) ▾

SUBMIT YOUR CONTRIBUTION

Goal-1 ▾

 EDIT EXISTING GOAL-1

Goal 1. Robust/integrated plans, policies and actions for effective delivery of climate change adaptation, together with monitoring, evaluation and review over the short, medium and longer-term.

What is being monitored and evaluated:

Number of business, sectoral, provincial and municipal legal frameworks, plans/strategies, policies, programmes and projects that incorporate climate change adaptation (e.g. Spatial Development Frameworks/Environmental Management Frameworks, Growth and Development Strategies, Disaster Management Plans, Conservation Plans, Food Security Strategies, Energy Security Strategies, Coastal Management Programmes, Agricultural Plans and Strategies, Integrated Development Plans and associated Sector Plans as prescribed in Municipal Systems and Structures Act, Water Catchment Strategies, Integrated Waste Management Plans, Alien Invasive Strategies, Environmental Impact Assessments, International Agreements on Water Allocation, Business Plans, Land Capability Plans, Air Quality Plans, Greening Strategies/Green Economy Strategies, Transport Strategies, Water Management Strategies, Forest Protection Strategies, Education Plans, Economic Plans, Tourism Plans, Human Settlements/Rural Development Plans, licensing/permitting/authorisation procedures and by-laws, and broader risk management procedures).*

How it is being evaluated:

RED Legal frameworks, plans/strategies, policies, programmes and projects not informed by existing risk and vulnerability profiles that include climate risks and impacts.

AMBER Legal frameworks, plans/strategies, policies, programmes and projects informed by risk and vulnerability profiles that include climate risks and impacts.

GREEN Implementation of legal frameworks, plans/strategies, policies, programmes and projects - informed by risk and vulnerability profiles that include climate risks and impacts - to reduce vulnerability in risk and vulnerability profiles and enhance capacity to respond to climate change impacts.

Goal 1 Assessment

1.1 Attach your document (see above description): *



Click or drag file here to attach

Who wrote the document? *

ADD AUTHOR DETAILS

What is the title of the document? *

Please select which keywords apply to the document: *

Unspecified

Please select the type of object you are uploading: *

Unspecified ▾

Please include an abstract or description for the document: *

Unspecified

1.2 Please add the details of all of the climate change adaptation or mitigation options or any research the Climate Change Response Database (CCR).

CCR

1.3 Does the document have a risk and vulnerability assessment?

YES

NO

1.4 When was the plan last updated?

2018-11-27

1.5 Select a region for this plan?

Select Region... (Leave empty for 'National') ▾

1.6 Specify non-government organisation name (if applicable)?

1.7 Select a sector for this plan?

Select Sector... (Leave empty for 'Any') ▾

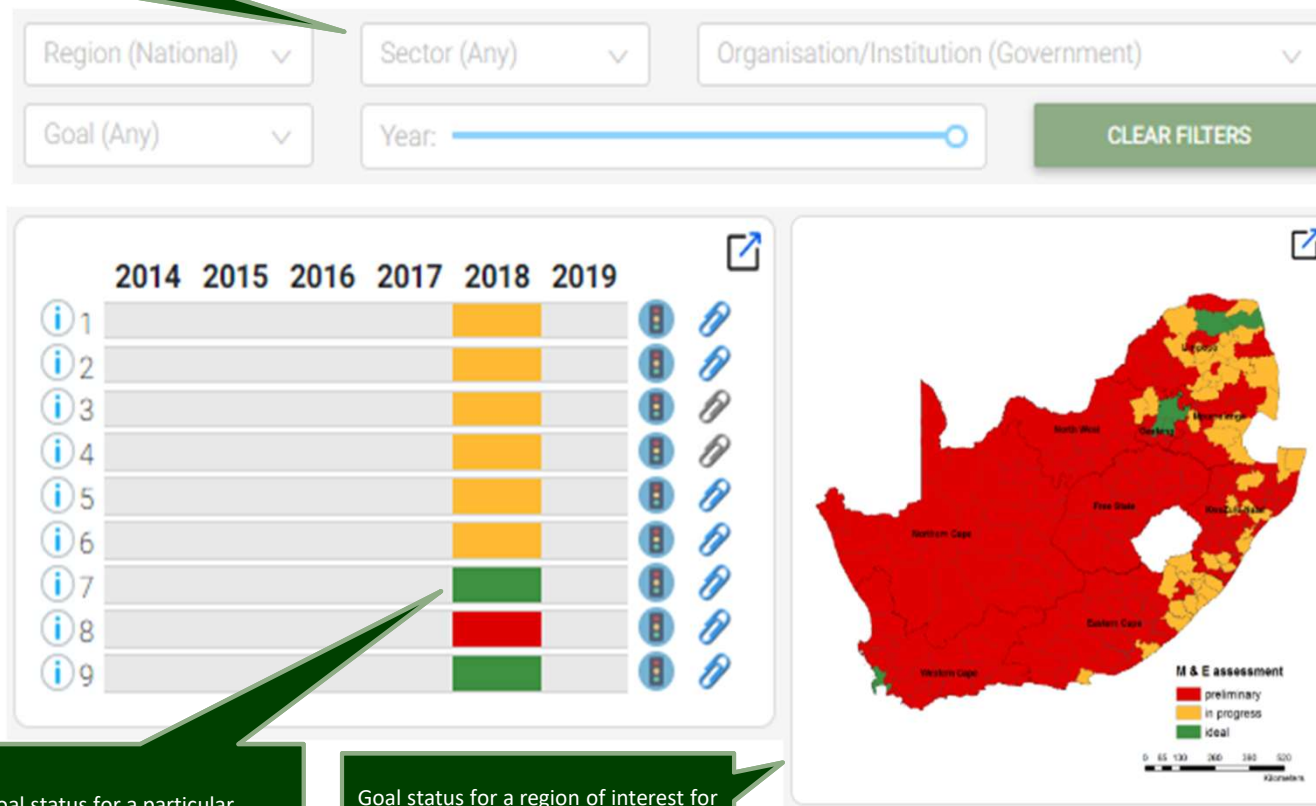
ADD

Based on your submission, your Goal 1 status is:



Summary of Desired Adaptation Outcome Questionnaire

Filters apply to applicable visualisations



Goal status for a particular government or organisation

Goal status for a region of interest for single goal

COMING SOON FEATURES



FINANCING
CLIMATE CHANGE
ACTION

Dec 2019

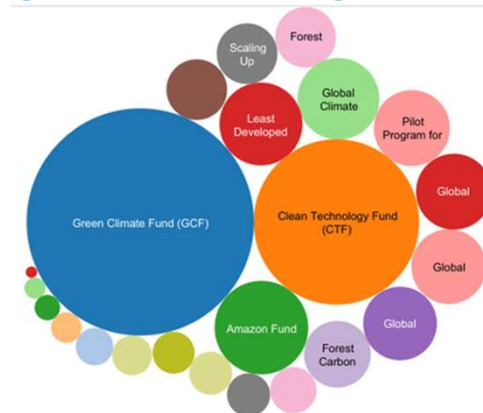
TECHNOLOGY NEEDS ASSESSMENT

The aim of South Africa's Climate Change Technology Needs Assessment (DST, 2007) was to identify and assess environmentally sound technologies that may, within national development objectives, reduce the impact of climate change and greenhouse gas emissions in South Africa. Subsequent desired outcomes of the assessment include its potential to open up access to funds, create an enabling environment for the transfer and uptake of technologies, and highlight opportunities for research and development cooperation. The Department of Science and Technology is currently in the process of updating the Technology Needs Assessment (Chapter 5, Section 5.1).

TECHNICAL ASSISTANCE

South Africa's NDE will set out to accelerate climate technology transfer in the country and has established its operational processes, including an advisory committee comprising representations from all relevant government departments, operational organisation structure and tools, such as periodic technical assistance project calls and project assessment procedures.

CLIMATE FINANCE



RESOURCES



COMING SOON

Dec 2019

NATIONAL

- The National Climate Change Response White Paper
- The National Development Plan
- Long Term Mitigation Scenarios, and the
- Long Term Adaptation Scenarios
- South Africa's Intended Nationally Determined Contribution
- South Africa's Third National Communication
- Annual Climate Change Reports
- Biennial Update Reports

PROVINCIAL

Provincial Climate Change Summary

The province has a draft [Climate Change Response Strategy](#) (2011), which covers both mitigation and adaptation. The strategy is detailed in covering climate change risks and priority response options. The strategy also includes a long list of Climate Change Adaptation Programmes, with proposed budgets and responsibilities.

During the development of the strategy, a climate change forum was established, but this forum is currently not meeting. The province convenes quarterly Environmental Quality Management (EQM) meetings, where Climate Change and in particular Air Quality issues are raised.

Current climate change specific programs that are taking place appear to be mitigation focused, namely the [Eastern Cape Provincial Sustainable Energy Forum](#) and a draft greenhouse gas inventory.

LET'S
RESPOND
TOOLKIT

SECTORAL

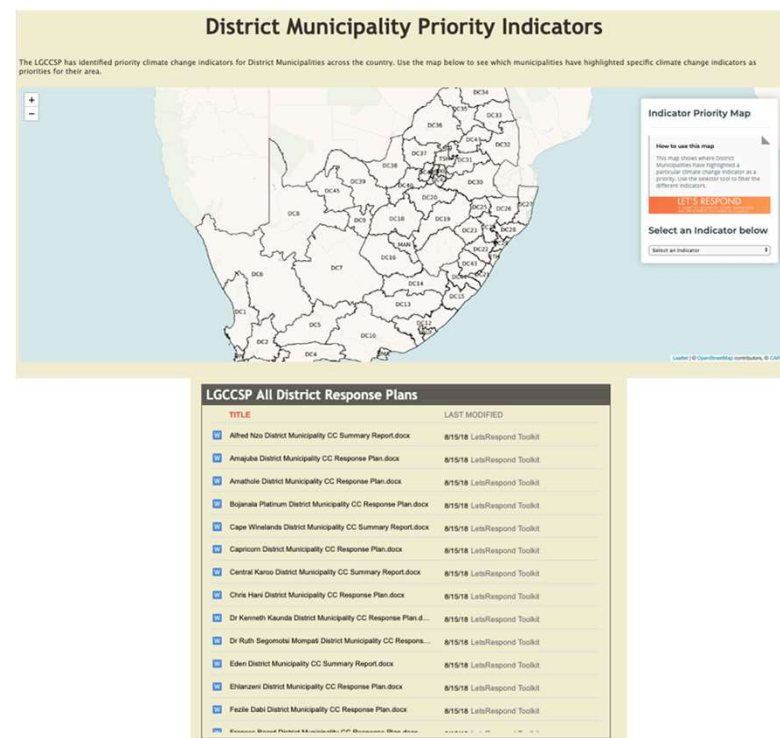
- Long Term Adaptation Scenarios
- South Africa's Third National Communication
- Sector Plans

TOOLS

LET'S
RESPOND
TOOLKIT

MUNICIPAL CLIMATE CHANGE RESPONSE PLANS

- Summary of CCRP
- Indicators
- Spatial Plan Checklist



COMING SOON TO NCCIS

Part 2 Integration LRT (Dec 2019)

+ REVIEW REPORT



COMING SOON

- Any resources, infographics or maps with a ##### symbol can be added to this report directly to be used for reporting purposes. When you are satisfied with the content, the report can be printed or downloaded for further use.
- This feature allows for reporting that is required at local, district, provincial and national scale.
- This feature can be tailored to suit the different reporting requirements, e.g. section headings.

MOODLE LEARNING PLATFORM

TRAINING MATERIAL

The training content will be updated as new component and systems are added.




National Climate Change Response Database

Training Manual V1

South Africa is projected to face a higher frequency of climate related disasters that are increasing in intensity, and these events are likely to be associated with impacts that are on par with, if not worse than those already experienced (Engelbrecht et al. 2018 Third National Communication to UNFCCC).

This user manual was designed to walk users through the National Climate Change Response Database and was intended as a resource to inform anyone currently working on climate change adaptation or mitigation on how to add these projects to the NCCRD.



National Desired Adaptation Outcome Questionnaire

Training Manual V1

South Africa is projected to face a higher frequency of climate related disasters that are increasing in intensity, and these events are likely to be associated with impacts that are on par with, if not worse than those already experienced (Engelbrecht et al. 2018 Third National Communication to UNFCCC).

This user manual was designed to walk users through the National Climate Change Information System and is intended as a resource to inform anyone interested in climate change information, responses or legislation.

FINAL RELEASE SYSTEM:

MARCH 2020

<https://ccis.environment.gov.za/#/>

<https://ccis.environment.gov.za/nccrd/#/>

<https://ccis.environment.gov.za/ndao/#/>