

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.



environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA



**science
& technology**
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



SAEON
South African Environmental
Observation Network

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Acronyms

CSIR	Council for Scientific and Industrial Research
DAO	Desired Adaptation Outcome
DEA	Department of Environmental Affairs
IDP	Integrated Development Plan
IPCC	Intergovernmental Panel on Climate Change
IRP	Integrated Resource Plan
MHEWS	Multi-Hazard Early Warning System
NCCIS	National Climate Change Information System
NCCRD	National Climate Change Response Database
SAEON	South African Environmental Observation Network
SARVA	South African Risk and Vulnerability Atlas
SAWS	South African Weather Service
SDBIP	Service Delivery and Budget Implementation Plan
SDG	Sustainable Development Goal
SPLUMA	Spatial Planning and Land Use Management Act

The NCCRD: Training Manual VI

Overview

The National Climate Change Response Database (NCCRD) is a Department of Environmental Affairs (DEA) project designed to capture and store the details of climate change intervention projects including adaptation, mitigation and research actions from across South African industrial, research and government bodies. It was first launched in 2009 and the goal of the latest release, as presented in the following materials, is to provide a space for recording climate change actions as well as a pool of climate change responses with enough detail that planners can determine what kinds of climate change options might work for their communities and what kinds of projects are already underway. That being said submission of information to the database is entirely voluntary and the accuracy of the information can not be guaranteed. Project managers are responsible for adding and maintaining information about their projects. Projects are reviewed and have to be accepted by DEA prior to becoming available in search results or infographics.

The NCCRD is one of the core components of the National Climate Change Information System (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 is a fully integrated component in the NCCIS's ecosystem of services which means that its entries are based on common vocabularies shared across the system and can be accessed via a common login. The NCCRD can be found at the system website here <https://ccis.environment.gov.za> or at its component website here <https://ccis.environment.gov.za/nccrd>.

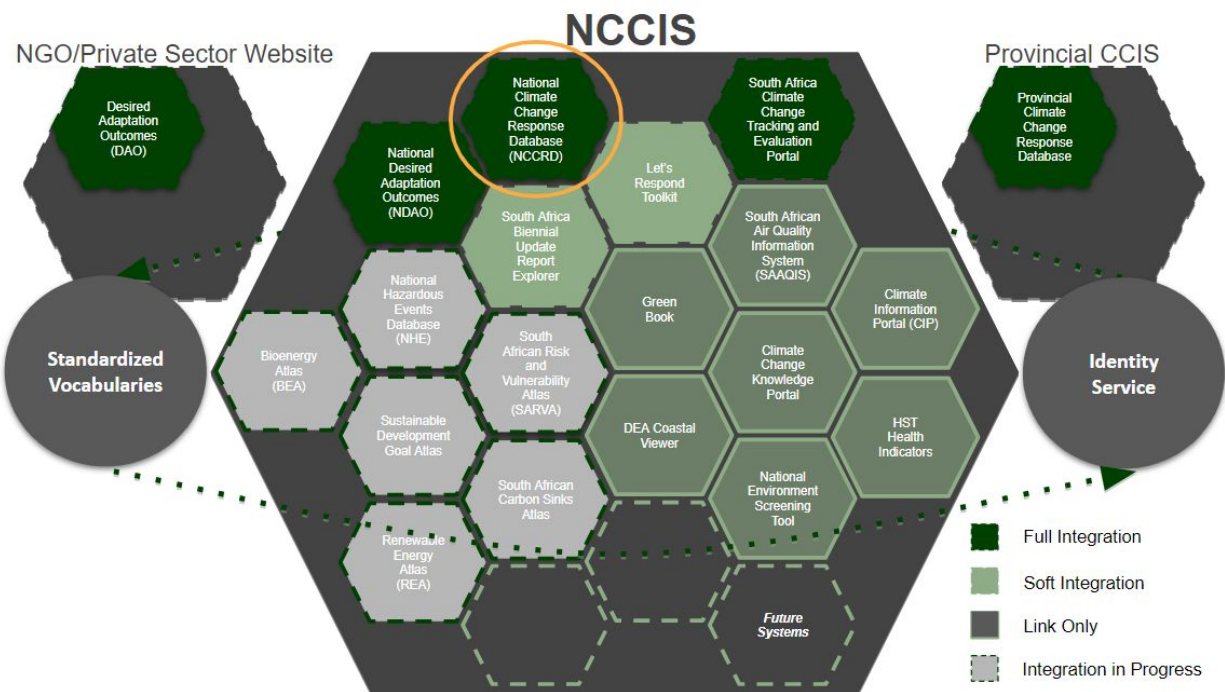


Figure 1: Expandable, interoperable national climate change ecosystem of systems.

Through the NCCRD each project in the database is broken down into several key areas including a general project overview, a description of the funding provided for the project, and the details of specific adaptation and mitigation actions taken in the project. For each action additional details are supplied depending on if the action is considered an applied or research action. 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.

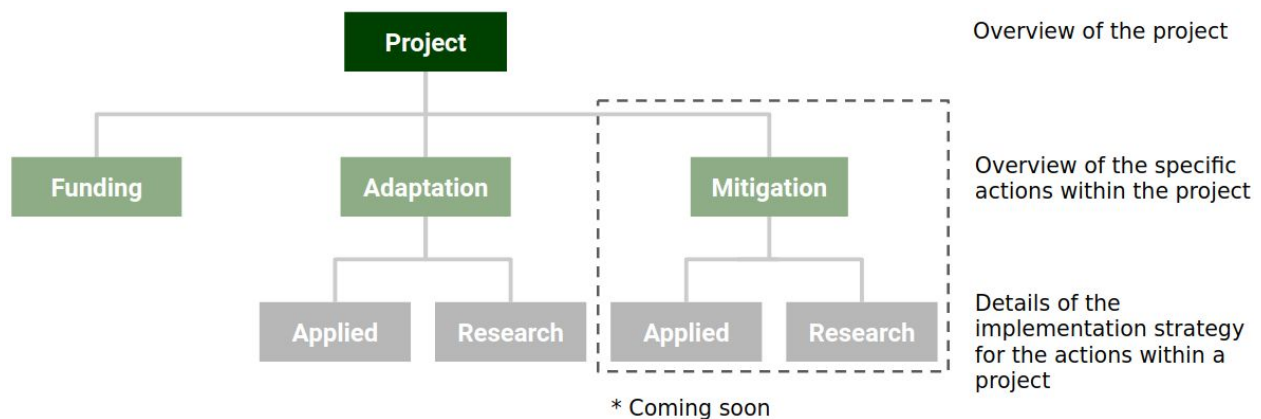


Figure 2: Figure . Structure of the NCCRD

As part of the larger system of systems, the NCCRD also ties directly into the National Desired Adaptation Outcomes Questionnaire. Any climate change plan can be linked to a NDAO entry or vice versa through directed links in both component

workflows. In the case of the NDAO, this is through the Goal 1 entry which deals with climate change plans (see NDAO training materials for details). In the case of the NCCRD, this is the second step in the input wizard (see details below).

Through the use of this manual you should be able to:

- A. Submit climate change responses to the NCCRD
- B. Search and locate climate change responses by location, sector, and/or title
- C. Download selected NCCRD database entries

To begin the training and for the latest release of the NCCRD, the user should navigate to the NCCRD website at <https://ccis.environment.gov.za/nccrd> and proceed with this manual or follow additional training materials in the NCCIS e-learning platform hosted here <http://elearning.ccis.saeon.ac.za>.

1. Login or Register

To enter data the user must start by first logging in and new users must register. Links to the SAEON identity service for login and registration can be found in the upper right corner of the NCCRD dashboard page.

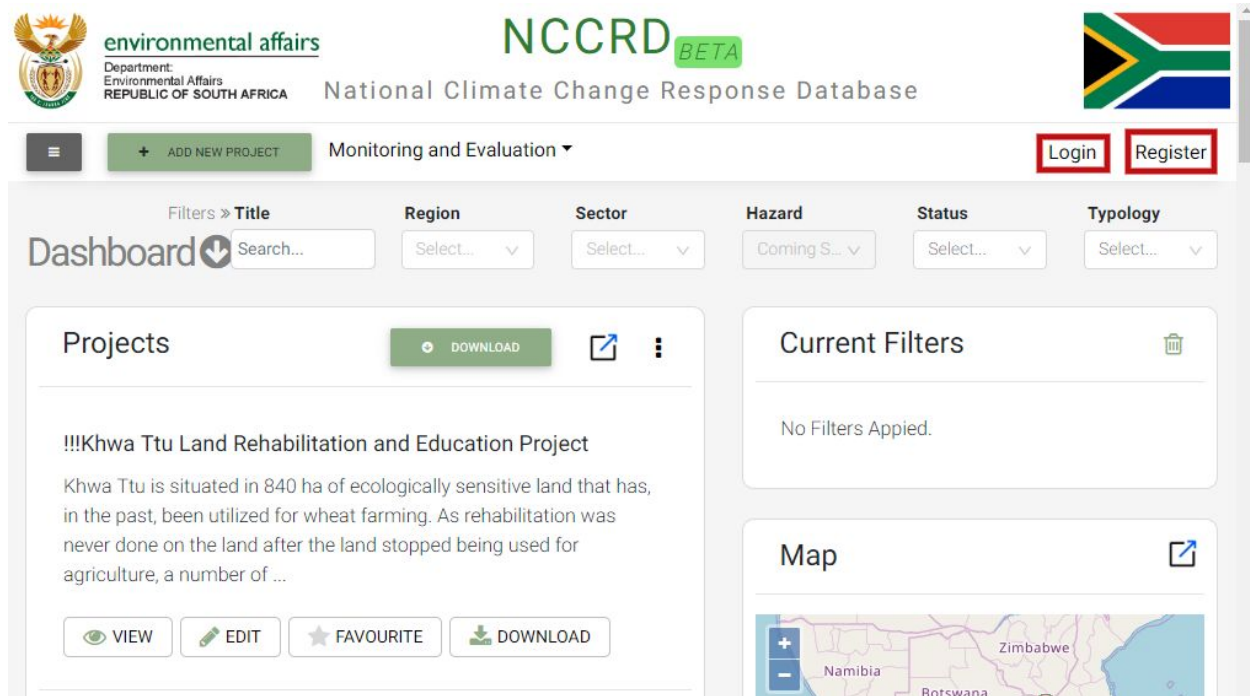



Image 1: [Login or register](#)

Registration through the SAEON identity server will grant access to all [NCCIS](#) systems including the NCCRD. It requires a minimum information including the user's name and surname, a valid email address, and a password as shown below.



Home About Contact Account ▾

Identity Service – Register


FirstName

Surname

Email

Password

Confirm
password

☐ I'm not a robot 
reCAPTCHA
Privacy - Terms

REGISTER

Image 2: Identity service registration

2. Add New Project

Once the registration process is complete and the user is logged in, data can then be added to the system. To begin, the user should select the '+ ADD NEW PROJECT' button.

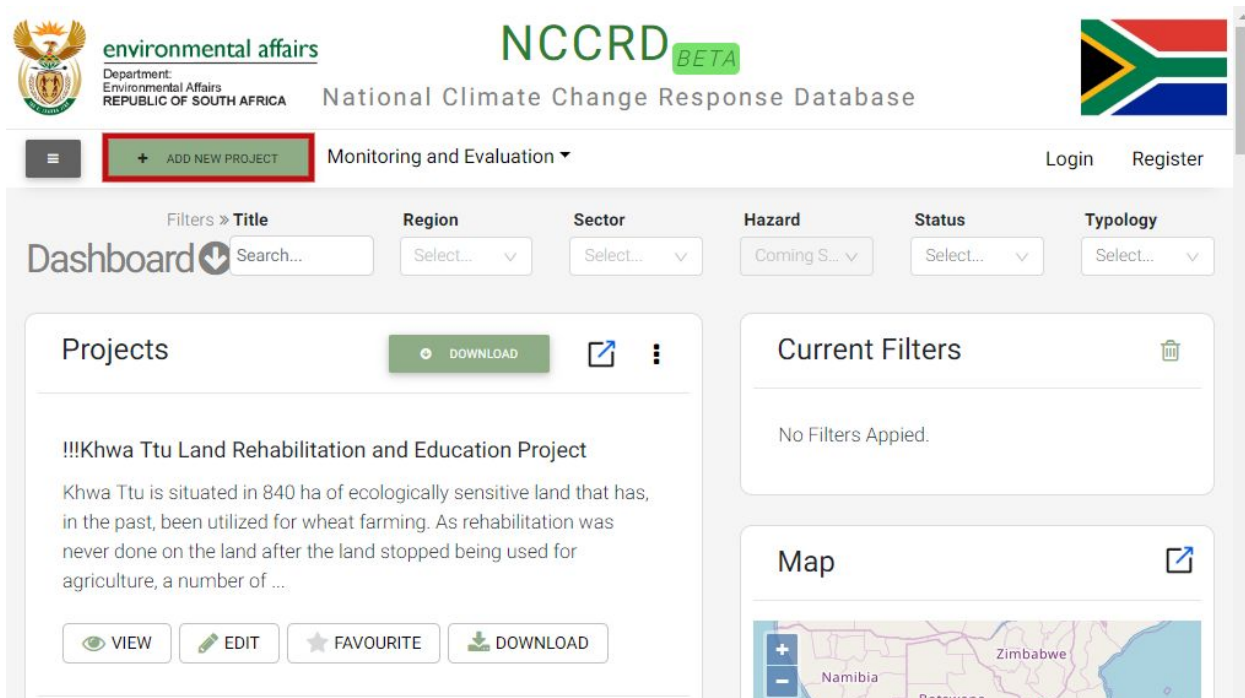


Figure 1: Add a new project

Project Details

This initiates the NCCRD project input wizard where project details can then be entered. The first panel is for a general description of the project details. For each field a tooltip has been generated to prompt the user should a field entry title be unclear. When the user has completed the data entry on the first page, the 'NEXT' button on the bottom right corner should be selected to continue.

1

Project -

Project - Details

Description of the project including aims, objective, methodology used, life expectancy and outcome. The outcome should be the actual or desired outcome of the project, such as findings of research, levels of emissions or energy savings, level of resilience achieved, human capital potential, other environmental, social and economic benefits.

3

Project -

Location

4

Project -

Manager

5

Actions -

Overview

6

Review -

Summary

i

Description:

i

Link:

i

Year:

0

-

0

i

Project status:

Select...

▼

i

Budget range:

R 0

-

R 0

0%

CANCEL

NEXT

Figure 2: Wizard page 1 - Project details

Link project to NDAO questionnaire

The second page is meant to link a project to NDAO Goal 1 entry. In order for a climate change plan to receive a green status within the NDAO questionnaire, the climate change projects within the plan must be added to the NCCRD (see NDAO training materials for additional details). The wizard automatically pushes the most recent NDAO entries to the top of the page for ease of reference. To link a NDAO Goal entry to a project description within the NCCRD the user should select the 'LINK' button as shown below. If

the user does not have a NDAO Goal 1 entry or has linked the entry to a NCCRD project, the 'NEXT' button at the bottom right corner will advance them to the next step.

Project - DAO Link
This step is optional, click 'Next' to skip

Linked DAOs:
No DAOs found.

Search for DAOs:

Your DAOs:

DAO Id: 0dbe37e9-5d87-4873-ac5a-9d0f6805317d
Created on: 2019-03-26
Last updated on: 2019-03-26
LINK

DAO Id: fafbe142-f464-4386-a610-5dade85c0eda
Created on: 2018-12-11
Last updated on: 2019-01-21
LINK

CANCEL **PREVIOUS** **NEXT**

Figure 3: Wizard page 2 - NDAO project link

The fourth page deals with the locations where specific projects will take place. The region or regions where the project are to take place can be selected at the local municipal level. In either case, multiple regions can be selected. If a region has been selected in error it can be removed by selecting the 'x' next to the name as shown below.

Regions:

Select...

- Eastern Cape
 - Alfred Nzo District Municipality (DC44)
 - Matatiele Local Municipality (EC441)**
 - Mbizana Local Municipality (EC443)
 - Ntabankulu Local Municipality (EC444)
 - Umzimvubu Local Municipality (EC442)
- Amathole District Municipality (DC12)

Regions:

City

- Eastern Cape
 - Buffalo City (BUF)
 - Buffalo City Metropolitan Municipality (BUF)**
- Gauteng
 - City of Johannesburg (JHB)
 - City of Johannesburg Metropolitan Municipality (JHB)
 - City of Tshwane (TSH)

Regions:

Buffalo City Metropolitan Municipality (BUF) x
 Matatiele Local Municipality (EC441) x
 Mbizana Local Municipality (EC443) x
 Amathole District Municipality (DC12) x

- Eastern Cape
 - Alfred Nzo District Municipality (DC44)
 - Matatiele Local Municipality (EC441)
 - Mbizana Local Municipality (EC443)
 - Ntabankulu Local Municipality (EC444)
 - Umzimvubu Local Municipality (EC442)
- Amathole District Municipality (DC12)

Figure 4: Add general locations to a project.

To add GPS pins and coordinates to describe individual actions select the '+ ADD LOCATION' button as indicated below.

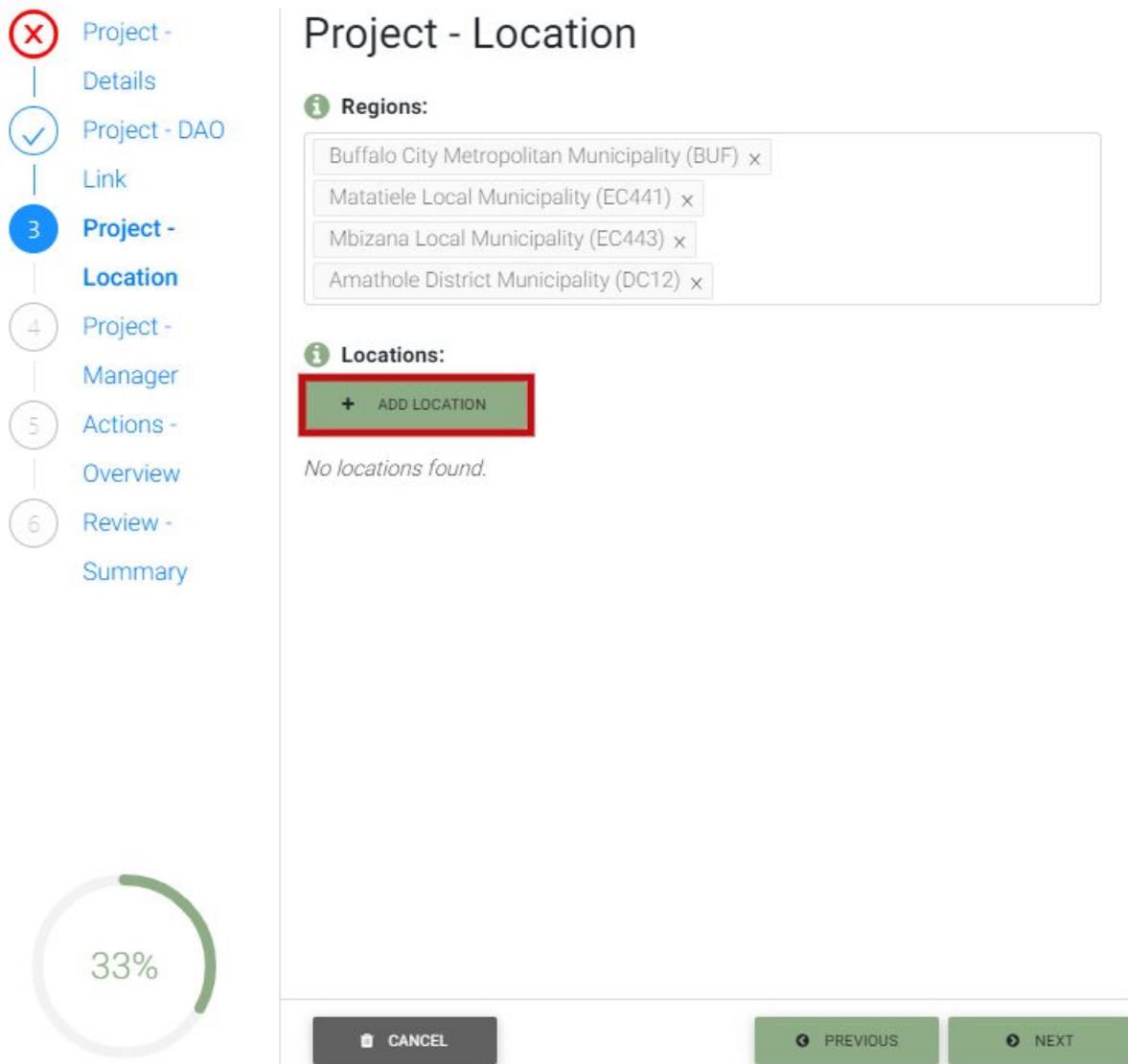


Image 5: Project location

When the location picker first appears on the screen, the view is of the entire country.

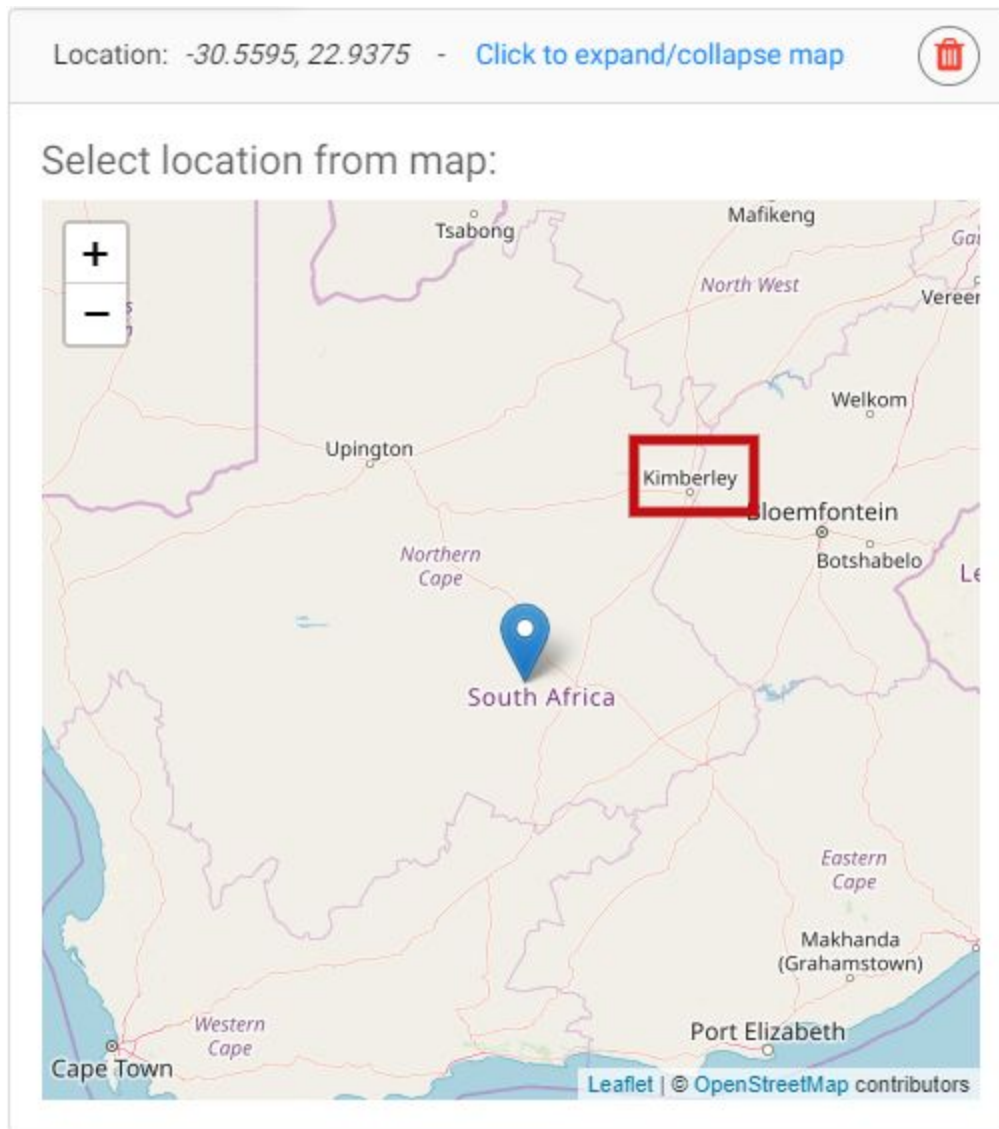


Figure 6: Action location and GPS pin

To add a project location to a specific area of the map and change the latitude and longitude coordinates described, for example to a street in Kimberly, zoom into that location and click and drag to the appropriate area. To move the location icon, click on the appropriate point on the map.

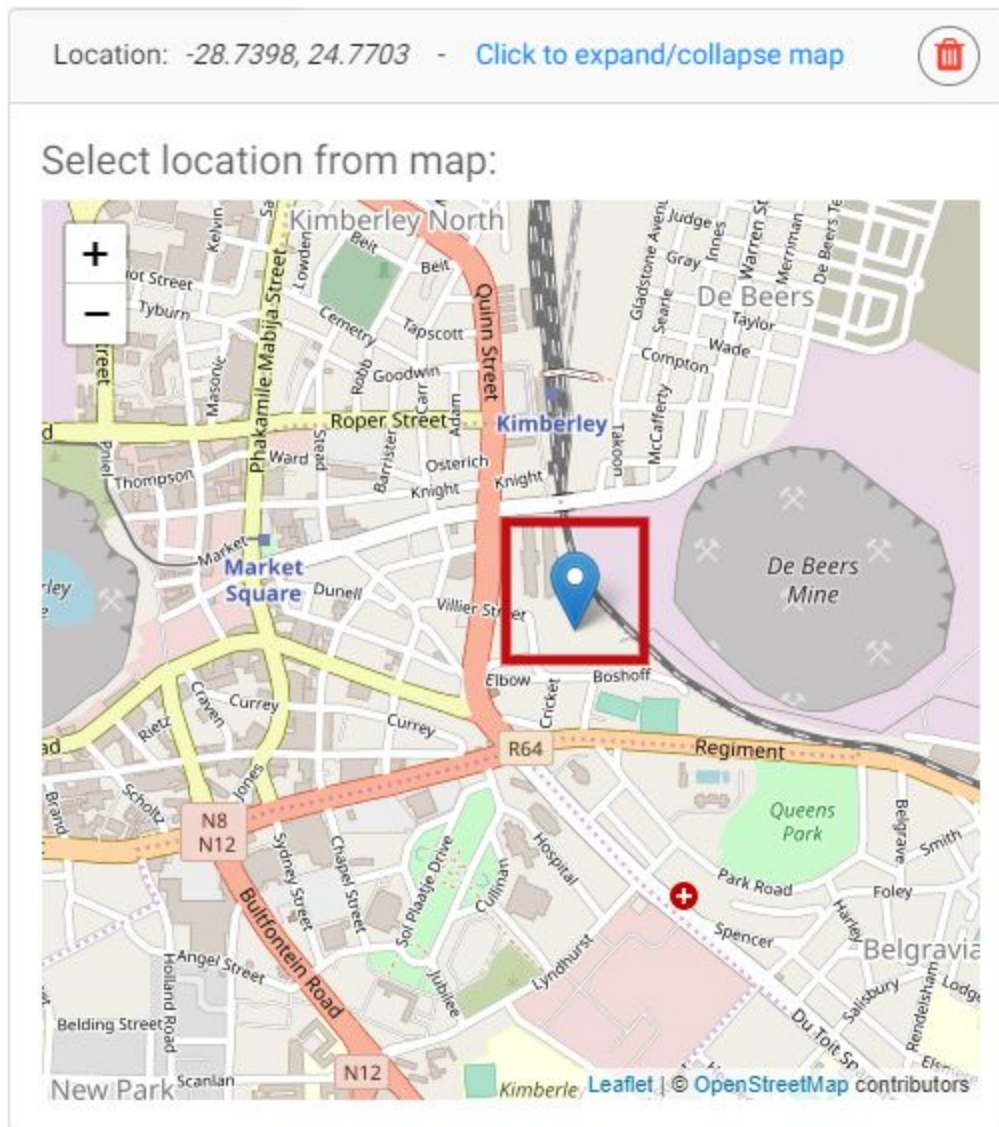



Figure 7: Select a project action location

To add additional project locations to the form, select the '+ ADD LOCATION' button as indicated below and follow the above steps. If a location has been added in error, it can be removed by selecting the rubbish bin icon to the right of the GPS coordinates. Once all of the project locations have been added, proceed by selecting the 'NEXT' button in the bottom right corner.

Locations:

 ADD LOCATION

Location: -28.7398, 24.7703 - [Click to expand/collapse map](#)



Location: -28.7343, 24.7666 - [Click to expand/collapse map](#)



Select location from map:

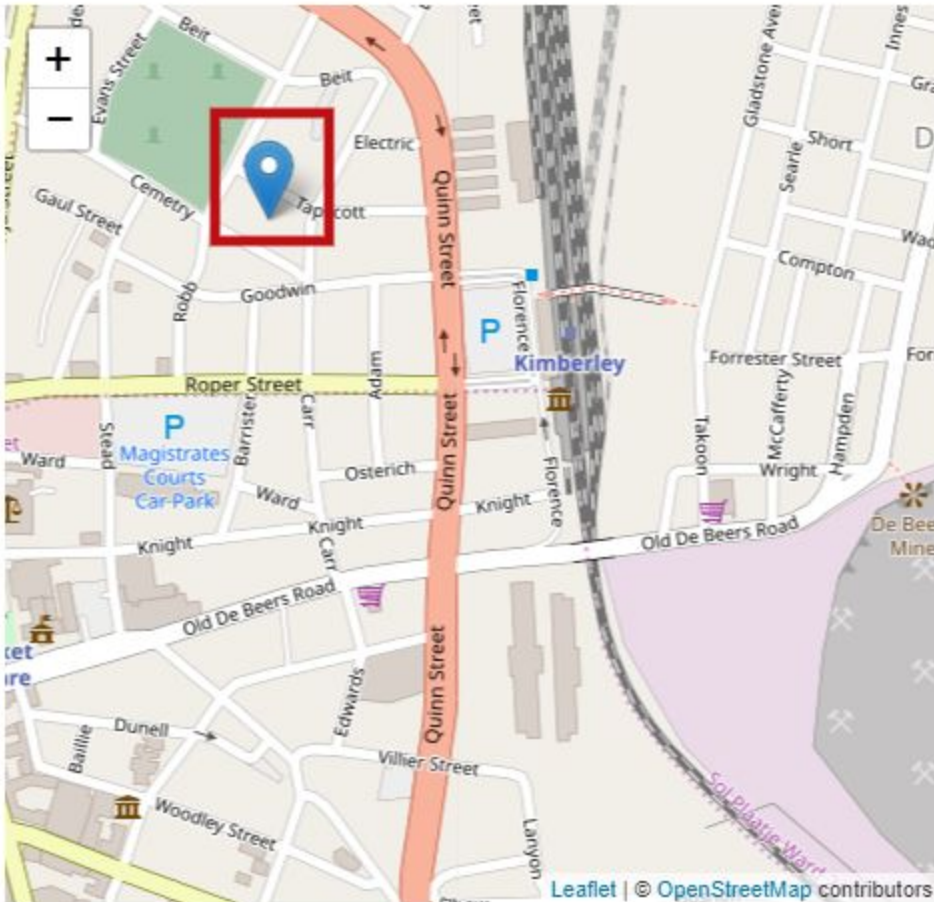


Figure 8: Add additional project locations

Project Management

The fourth page of the wizard is a variety of entry fields describing the management of the project. The 'Project manager' drop down allows for details to be selected from prior entries and should be consulted prior to the addition of new details, however if the

project manager does not appear in the list the list can be amended by selecting the '[Edit list values...]' option from the drop down list as show below.

The screenshot displays the 'Project - Manager' interface. On the left is a sidebar with a vertical list of items: 'Project - Details' (checked), 'Project - DAO' (checked), 'Link', 'Project - Location', 'Project - Manager' (highlighted with a blue circle and the number 4), 'Actions - Overview' (5), and 'Review - Summary' (6). Below the sidebar is a circular progress indicator showing '50%'. The main content area is titled 'Project - Manager' and contains two sections: 'Lead organisation:' with an empty text input field, and 'Project manager:' with a dropdown menu. The dropdown menu is open, showing a list of names and email addresses, with the option '[Edit list values...]' highlighted in a red box. At the bottom of the main content area are three buttons: 'CANCEL', 'PREVIOUS', and 'NEXT'.

Figure 9: Project manager

This engages the 'Edit values list' popup. To add a new manager and details to the list select the 'ADD' bottom as show below.

Edit list values

Select item to edit:

Abraham Singels (r.singels@sugar.org.zaudzani)
Adam Ward (Ada.Ward@capetown.gov.z)
Adele Faure (adfaure@gmail.com)
Ahmed Khen (ahmed@dwaf.gov.za)
Akpofure Taigbenu (akpofure.taigbenu@wits.ac.za)
Alan Carter (alan.carter@eoh.co.za)
Alan John Boyd (ajboyd@environment.gov.za)
Alex Aylett (alex.aylett@gmail.com)
Amalia Christoforou (amalia@carteblanche.co.za)
Ancois De Villiers (ancois@award.org.za)

Edit item details:



Figure 10: Add a new manager.

Once all of the relevant details have been added select 'save' to continue.

Edit list values

Select item to edit:

* ENTER VALUE HERE

Abraham Singels
(r.singels@sugar.org.zaudzani)

Adam Ward
(Ada.Ward@capetown.gov.z)

Adele Faure (adfaure@gmail.com)

Ahmed Khen (ahmed@dwaf.gov.za)

Akpofure Taigbenu
(akpofure.taigbenu@wits.ac.za)

Alan Carter (alan.carter@eoh.co.za)

Alan John Boyd
(ajboyd@environment.gov.za)

Edit item details:

EmailAddress
ENTER VALUE HERE

FirstName

Surname

Organisation

PhoneNumber

ADD

SAVE

CANCEL

Figure 11: New manager details.

Once all of the management details have been captured, select the 'NEXT' button in the bottom right corner to proceed.

Action Details

Three action types are available for each project; funding, adaptation and mitigation and in each case as many of each action can be added to a project as needed. Funding actions are meant to describe each funding partnership involved in the greater project. Adaptation and Mitigation actions are the specific actions meant to contend with climate change to be taken within the project. Currently, only climate change adaptation options can be described but within the next release mitigation actions and cross cutting actions will also be provisioned for. To begin select the ' + ADD FUNDING' and ' + ADD ADAPTATION' buttons to indicate the number of adaptation and funding actions covered by the project.

Project - Details

Project - DAO Link

Project - Location

Project - Manager

5 Actions - Overview

6 Review - Summary

Actions - Overview

This step is optional, click 'Next' to skip

Would you like to add any actions to this project?

+ ADD FUNDING

+ ADD ADAPTATION

+ ADD MITIGATION
COMING SOON

CANCEL

PREVIOUS

NEXT

67%

Image 12: Actions overview

Once a funding action has been added an additional page will be added to the wizard to collect the details of the funding partnership described. Within the list of actions table below, space is provided to identify each action. Similarly, the addition of an adaptation action will add pages to the wizard for further action details and basic descriptive information for the action will be added to the 'List of existing actions'. Also from this list the options to 'EDIT' or 'REMOVE' an action are provided. Unlike funding actions adaptation action implementation can follow two approaches, applied or research. Research options are studies designed to test some aspect of action implementation whereas applied projects can be implemented or rolled out directly at a variety of scales.

The implementation approach can be selected from the 'Implementation' dropdown in the 'List of existing actions' table for each adaptation action.

Actions - Overview
This step is optional, click 'Next' to skip

Would you like to add any actions to this project?

+ ADD FUNDING + ADD ADAPTATION + ADD MITIGATION
COMING SOON

List of existing actions:

Title	Type	Implementation	Funded <small>*coming soon*</small>	Options
Funding #1	Funding	Applied	<input type="checkbox"/> (No)	EDIT REMOVE
Adaptation #1	Adaptation	Applied ▾	<input type="checkbox"/> (No)	EDIT REMOVE
Adaptation #2	Adaptation	Applied ▴ Applied Research	<input type="checkbox"/> (No)	EDIT REMOVE

[CANCEL](#) [PREVIOUS](#) [NEXT](#)

Figure 13: Add funding and adaptation actions

Where research implementations are selected for adaptation actions one more additional page is added to the wizard to capture the additional research details.

List of existing actions:

Title	Type	Implementation	Funded <small>*coming soon*</small>	Options
Funding #1	Funding	Applied	<input type="checkbox"/> (No)	EDIT REMOVE
Adaptation #1	Adaptation	Applied ▾	<input type="checkbox"/> (No)	EDIT REMOVE
Adaptation #2	Adaptation	Research ▾	<input type="checkbox"/> (No)	EDIT REMOVE

Figure 14: Add research implementation to adaptation action

As many funding and adaptation actions as needed can be added to the project. Once these additions are complete, the 'NEXT' button in the bottom right corner can be selected to proceed.

The following few pages of the wizard deal with content relating to the actions of the project. At any time '< Actions - Overview' button can be selected and user will be taken back to the previous page where an action can be modified or deleted if needed. This option will appear on the first input wizard page for each action. When all of the details have been added, the user can then proceed to the next page by selecting the 'NEXT' button in the bottom right corner.

Funding #1 - Details

[< Actions - Overview](#)

i Grant or program name:

i Funding agency:

i Partnering departments/organisations:

i Project coordinator:

i Total budget:

i Annual budget:

i Funding status:

CANCEL **PREVIOUS** **NEXT**

42%

Figure 15: Funding details

Adaptation action details start with a general project description. The '< Actions - Overview' button is again available on the first page of the adaptation action description to take users back to the action overview page to modify or delete an action if needed. The 'Hazard' field will soon be implemented formally where a user will be able to select all of the hazard types a particular adaptation action is designed to address.

Adaptation #1 - Details

[← Actions - Overview](#)

Title:

Description:

Purpose:

Select...

Sector:

Select...

Hazard:

Coming Soon...

Project status:

Select...

Navigation:

[CANCEL](#) [← PREVIOUS](#) [NEXT →](#)

Progress: 50%

Image 16: Adaptation action details

The contact details for the person responsible of the adaptation action can then be entered in the adaptation action contact page or page 8 as shown below. Once these details have been added the user can select the 'NEXT' button to continue.

Adaptation #1 - Contact

Name:

Email Address :

58%

CANCEL **PREVIOUS** **NEXT**

Image 17: Adaptation action contact details

Adaptation research is typically associated with some form of formal output such as a journal article or official report. The adaptation research page, or page 9 in the example below, provides space for the user to provide additional details of the research and its purpose. Once the user has completed the data entry the 'NEXT' button can be selected to continue.

Adaptation #2 - Research

Author:

Paper link:

Research type:

Target audience:

Research Maturity:

Navigation: CANCEL PREVIOUS **NEXT**

Progress: 83%

Image 18: Adaptation research details

Review entry details and submit

The final page of the wizard contains a summary accordion where the data entries can be reviewed prior to submission. Each section can be reviewed by selecting the section in the accordion such as “> PROJECT”. All of the sections of the entry can be viewed at once by selecting the “Expand all” button in the top right corner. Any or all of the open sections can collapsed again by selecting the “Collapse all” button in the top right corner. Additionally, the entire report can be downloaded and reviewed by selecting the 'Download' option.

✓ Actions - Overview

✓ Funding #1 - Details

✓ Adaptation #1 - Details

✓ Adaptation #1 - Contact

✓ Adaptation #2 - Details

✓ Adaptation #2 - Contact

✓ Adaptation #2 - Research

12 Review - Summary

92%

Review - Summary

Please review before submitting

[Download](#) [Expand all](#) [Collapse all](#)

📍 Title

> PROJECT

> FUNDING

> ADAPTATION

> MITIGATION

CANCEL

PREVIOUS

SUBMIT

Image 19: Review summary

At this point the text of the entry can be reviewed. To edit the entry, the user must go back to the wizard page where the details were originally entered and modify them in their specific entry fields. Once the user is satisfied with the entry, the “SUBMIT” button can be selected from the bottom right corner as shown below.

Figure 20: Review summary open

The 'Confirm submission' popup then engages and the user can confirm their submission to the NCCRD by selecting 'Yes' as indicated below. This will then return the user to the NCCRD dashboard.

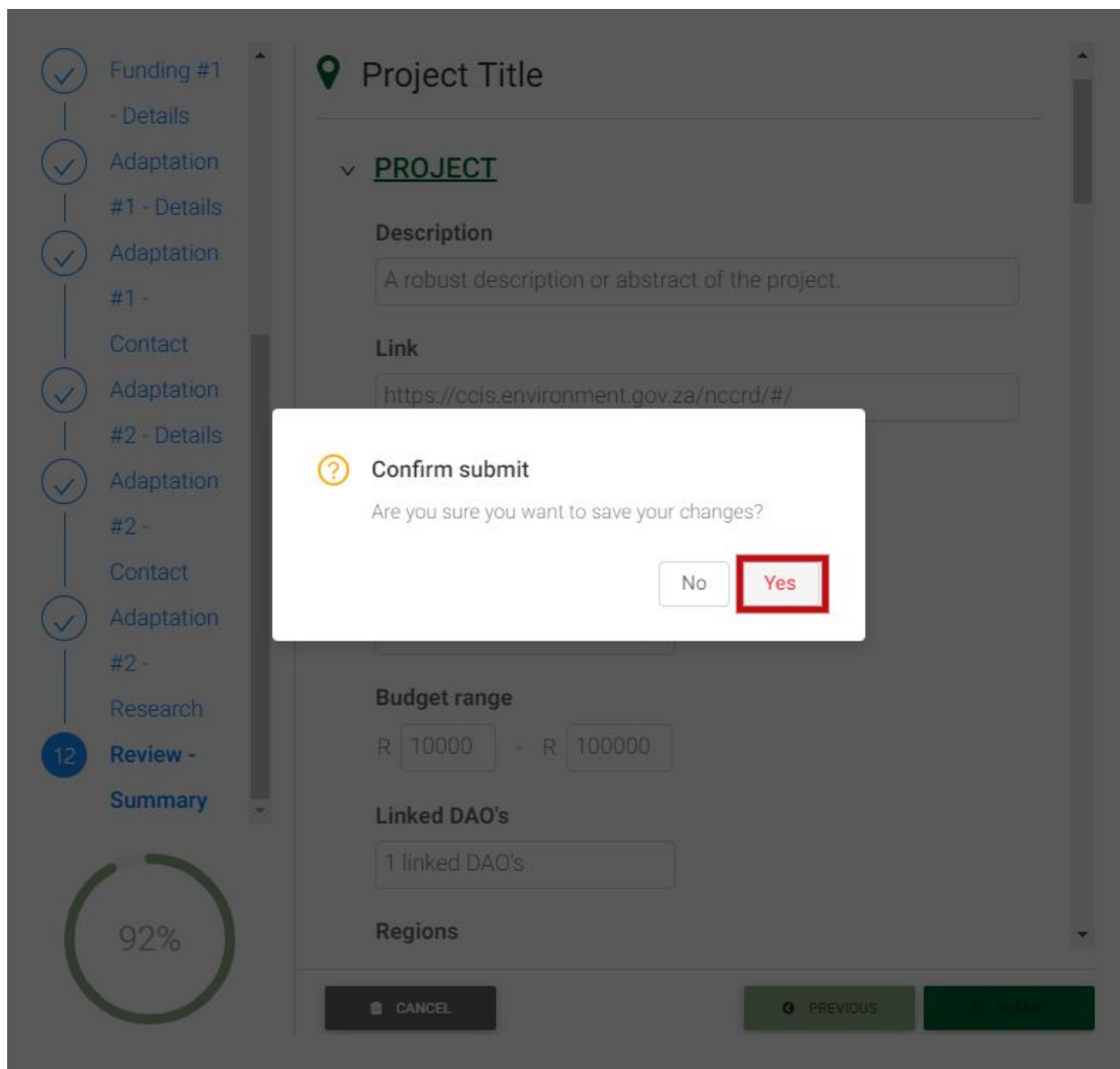


Figure 21: Review summary

3. Research

This section deals with the research and reporting features of the NCCRD. The database is searchable through a series of filters as outlined below and currently includes filters for project title, region down to the local municipal level, sector (as defined in the Standard Industrial Classification (SIC) definitions), project status, and project typology. A hazard filter will also soon be available and the adaptation projects will be searchable for any of the hazards that project is designed to address. Currently, projects which address certain hazards can be found by using the title search for keywords such as 'flood'. Any person can search for projects in the NCCRD, thus a login is not needed at this point.

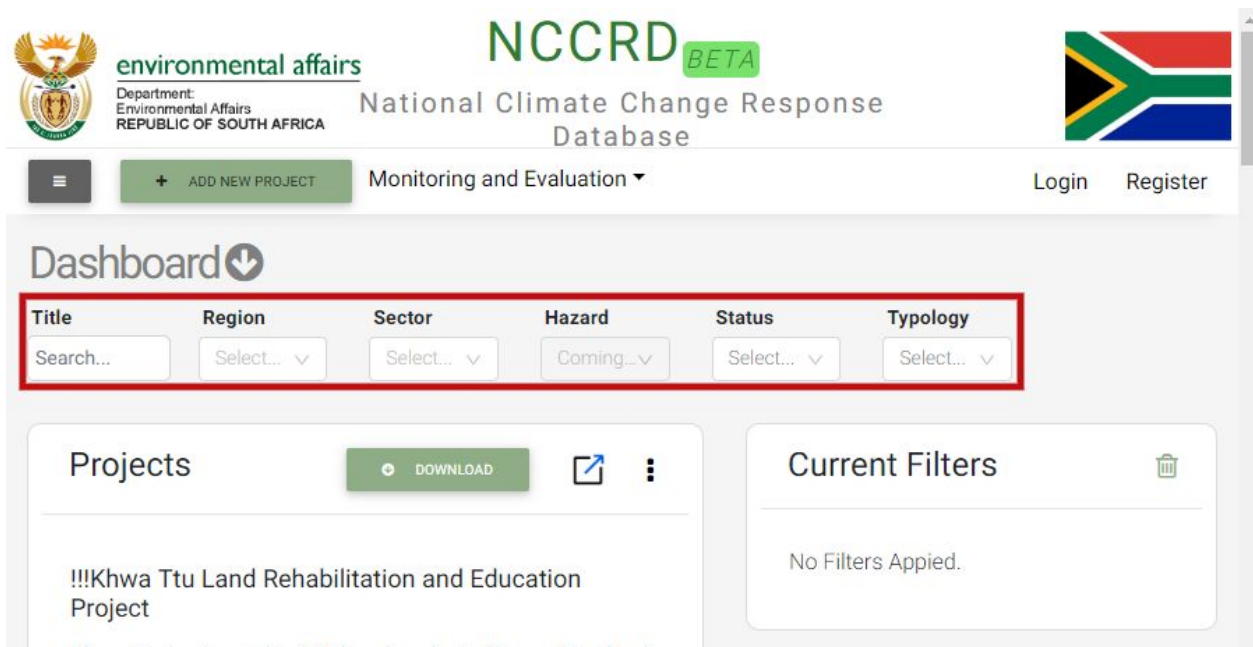


Figure 1: Dashboard filters

Where relevant the user can drill down into the filters for a finer data resolution. Below, this is demonstrated with the 'Region' filter which starts at the national level and can be subset to the local municipal level. This can be done by subsetting a province into a district municipality and then into a local municipality or by applying the search function as shown below. Note that each layer in the filter displays the number of sub-places of the next level that it contains.

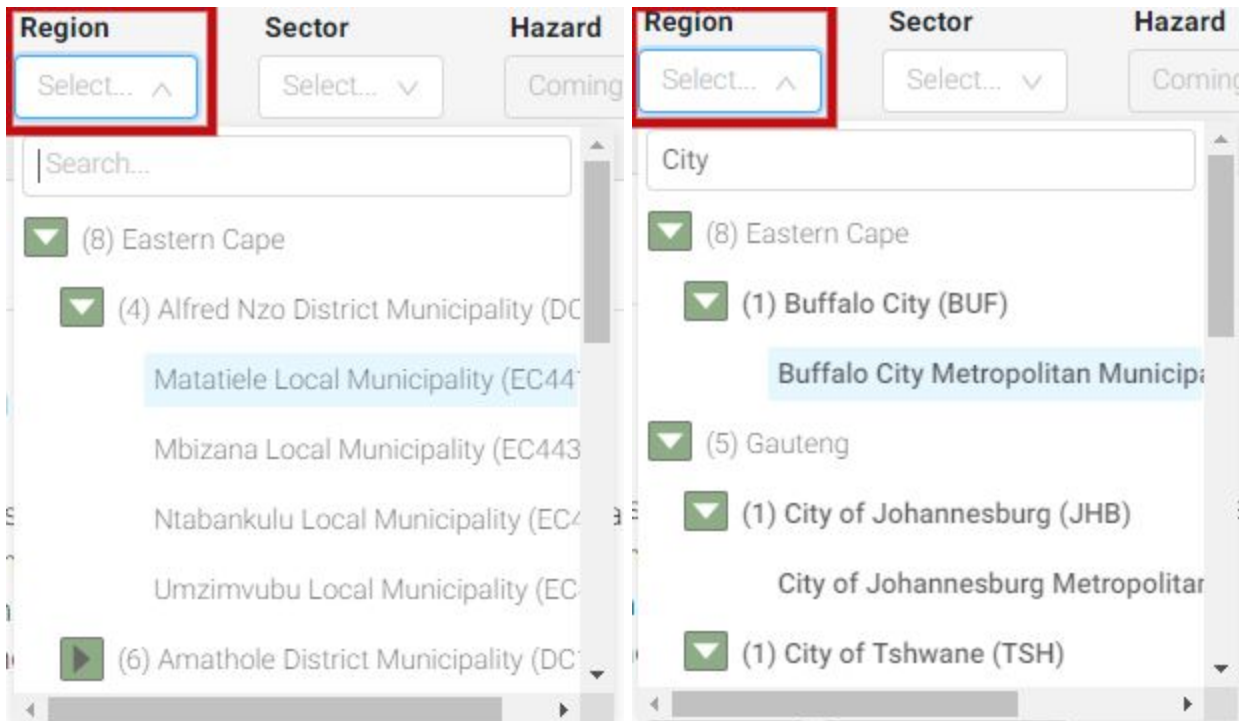


Figure 2: Filtering functions in the NCCRD.

Multiple filters can be selected simultaneously and their selection will appear in the filter bar under the filter title as well as pills in the 'Current Filters' section as shown below. Filters can also be removed individually by selecting the 'x' at the end of the filter option in the filter bar or the 'x' within the pill display under 'Current Filters'.

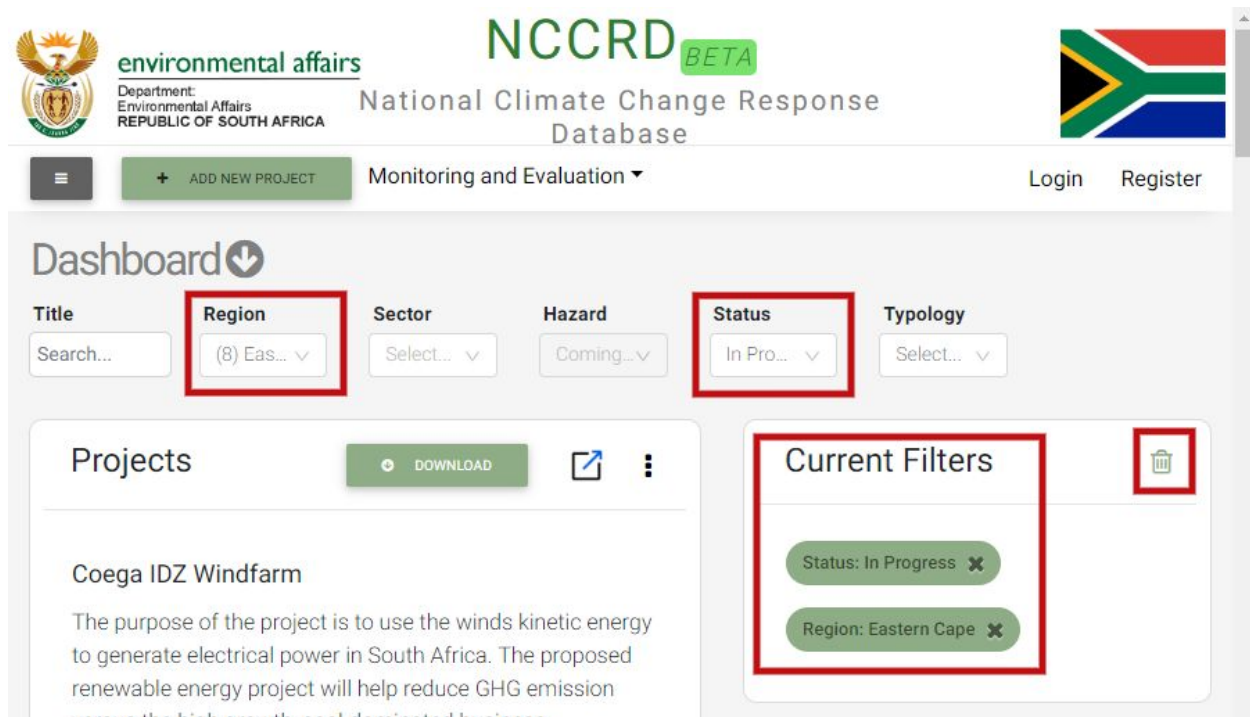


Figure 3: Filter application

Applied filters modify the project list, the map display and the charts in the NCCRD dashboard as seen below.

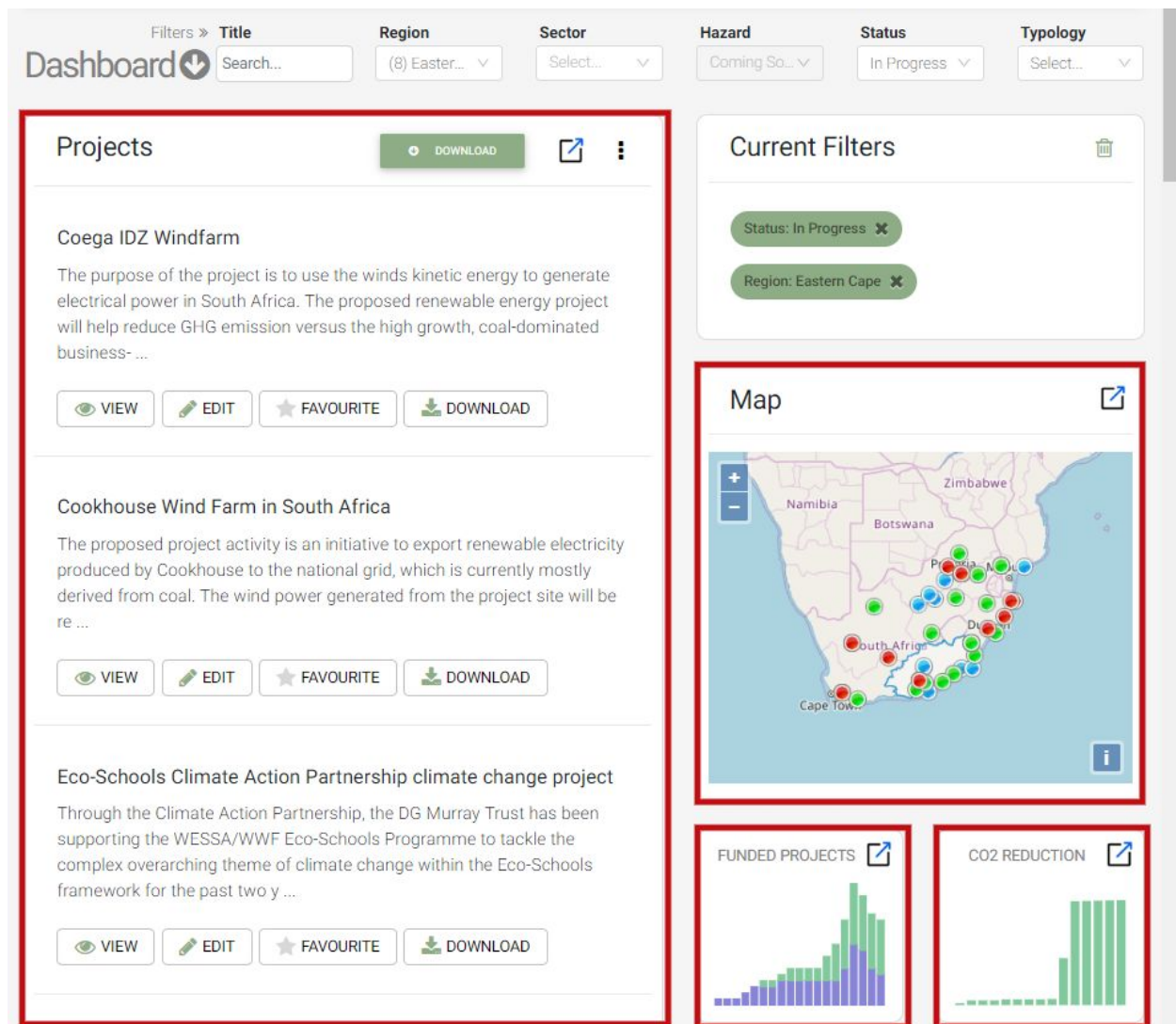


Figure 4: Filter impact

The details of the map and chart widgets and the project list can be further explored by selecting the arrow icon in the top right corner of their boxes. Once review of these details has been concluded the arrow in the top left corner can again be selected to return to the dashboard.

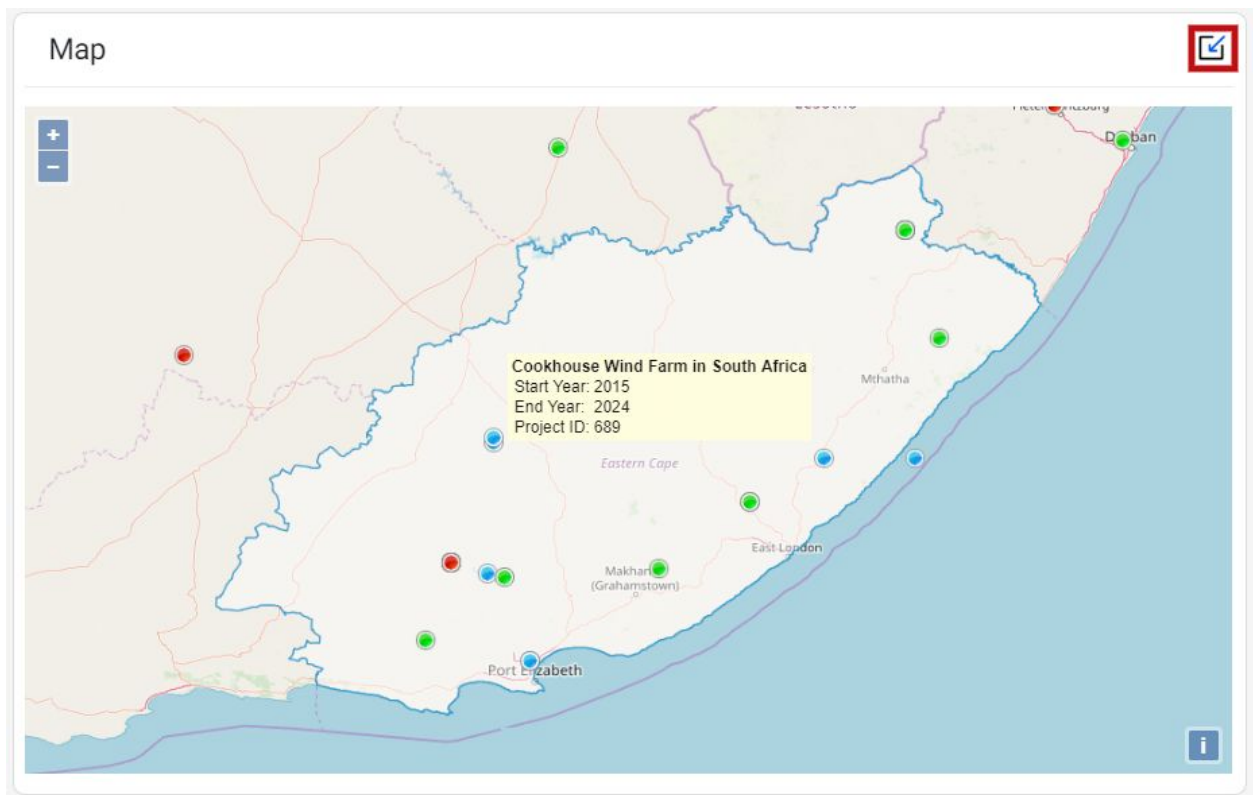
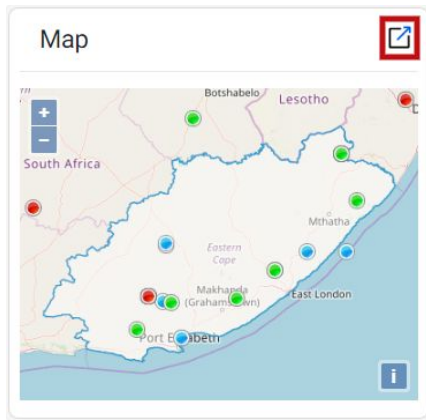


Figure 5: Research using dashboard widgets

4 .Review

To find projects of interest, the filters can be applied as described in the previous section. The details of a specific project can be reviewed by selecting the 'VIEW' button under the project title in the 'Projects' list as indicated below.

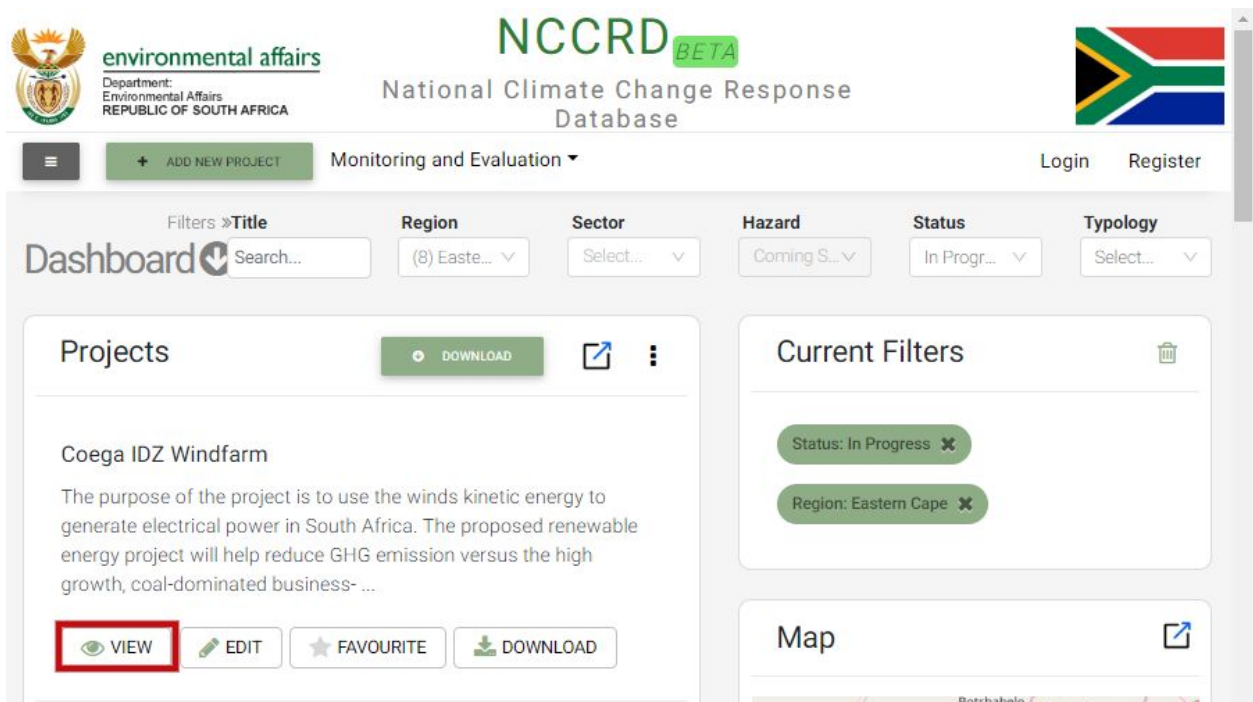


Figure 1: View project details

Selection of the 'VIEW' button results in an accordion summary of a project's details. This is broken into relevant sections which can be viewed one at a time by selecting the relevant section such as '> PROJECT' or by viewing all of the sections simultaneously by selecting the 'Expand all' option in the top right corner as shown below. Selection of the section header or of the 'Collapse all' option in the top right corner will collapse a single section or all of the sections respectively.



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

NCCRD BETA

National Climate Change Response
Database



+ ADD NEW PROJECT

Monitoring and Evaluation ▾

Login

Register

⦿ BACK TO LIST

[Download](#) [Expand all](#) [Collapse all](#)

📍 Coega IDZ Windfarm


> [PROJECT](#)

> [FUNDING](#)

> [ADAPTATION](#)

> [MITIGATION](#)

[BACK TO LIST](#)[Download](#)[Expand all](#)[Collapse all](#)

 **Coega IDZ Windfarm**

▼ **PROJECT**

Description

The purpose of the project is to use the winds kinetic energy to generate electrical power in South Africa. The proposed renewable energy project will help reduce GHG emission versus the high growth, coal-dominated business-as-usual energy production scenario

Link

<https://cdm.unfccc.int/Projects/projsearch.html>

Year

2014 - 2020

Status

In Progress

Budget range

R - R

Linked DAO's

0 linked DAO's

Regions

Nelson Mandela Bay Metropolitan Municipality (NMA)

Figure 2: Expand and collapse project details

The project details can also be downloaded as a spreadsheet by selecting the 'Download' option.

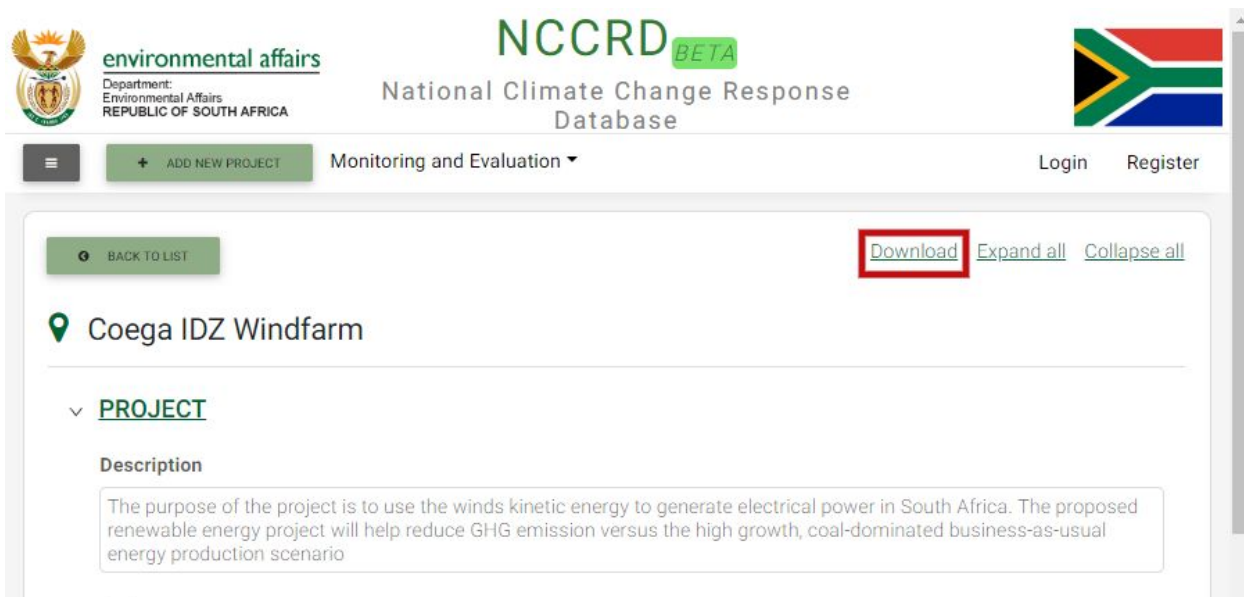


Figure 3: Download project details

Selecting the download option engages the 'Save As' popup and will allow the user to select where on their computer they would like to save the project details. The project can be saved by selecting the 'Save' button in the bottom right corner.

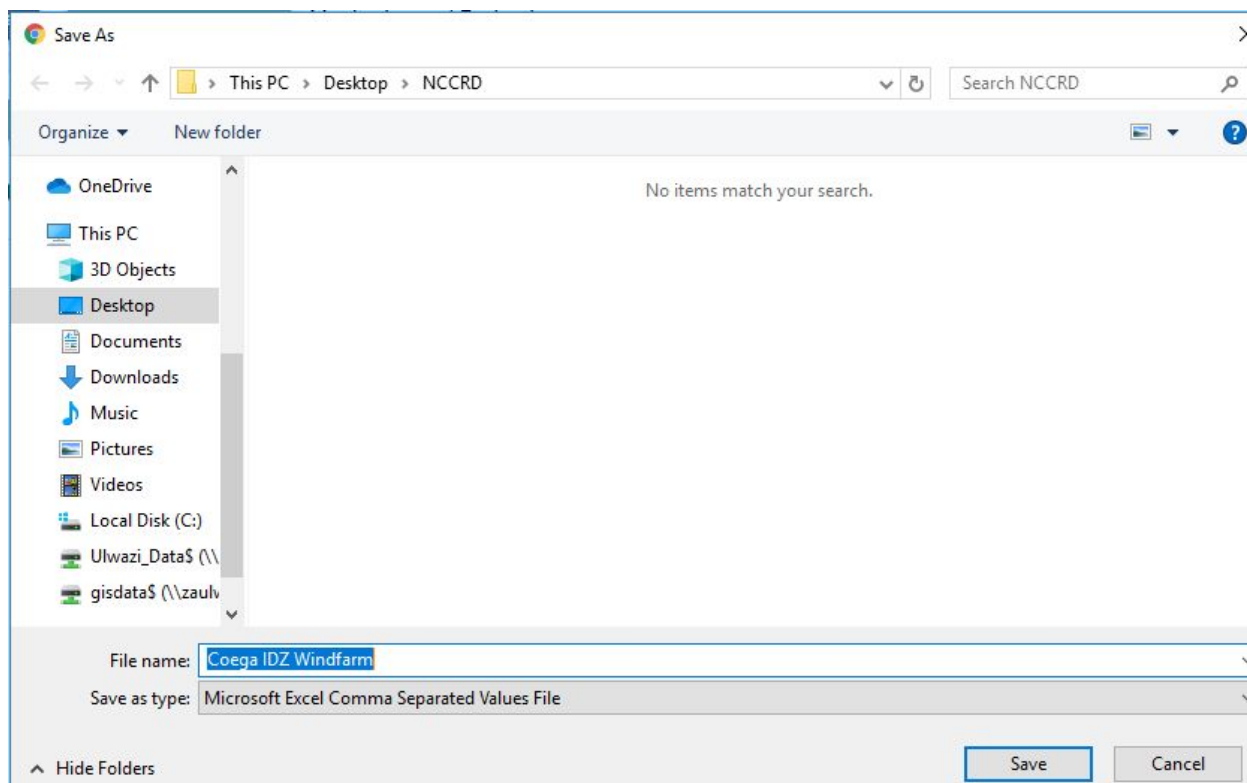


Figure 4: Save As popup

This file can now be viewed in Microsoft Excel, Office Libre, or saved to Google Drive and viewed as a Google Sheet.

Once the user has finished reviewing the project details, they can return to the NCCRD dashboard by selecting the '< BACK TO LIST' button in the upper left corner of the project summary.



Figure 5: Return to dashboard view

If errors or necessary updates are identified while a user is reviewing a project, the project can be modified by selecting the 'EDIT' button from the dashboard as shown below which will engage the input wizard for that project. Users must be logged in in order to edit a project. To edit a project a user must first be logged in.

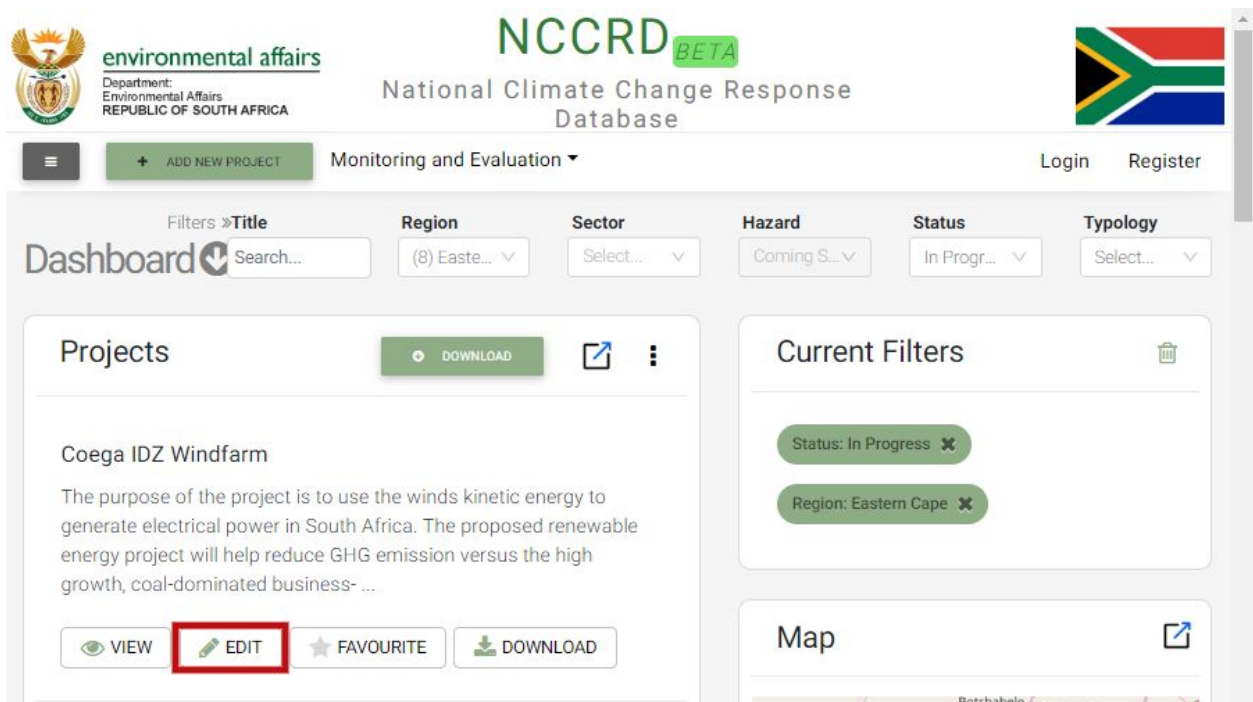


Figure 6: Editing a database entry

The interface engages the input wizard and allows the user to interact with the relevant section of the database entry. Updates to entries can be saved on the 'Review - Summary' page by selecting the 'SUBMIT' button.

1

Project - Details

2

Project - DAO

Link

3

Project -

Location

4

Project -

Manager

5

Actions -

Overview

6

Funding #1 -

Details

7

Funding #2 -

Details

8

Review -

Summary

0%

Project - Details

Project title:

Coega IDZ Windfarm

Description:

The purpose of the project is to use the winds kinetic energy to generate electrical power in South Africa. The proposed renewable energy project will help reduce GHG emission versus the high growth, coal-dominated business-as-usual energy production scenario

Link:

<https://cdm.unfccc.int/Projects/projsearch.html>

Year:

2014

-

2020

Project status:

In Progress

Budget range:

R

-

R

CANCEL

NEXT

Figure 7: Editing in the wizard

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Glossary of Terms

Adaptation is a means of responding to the impacts of climate change. It is “the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate harm or exploit beneficial opportunities. In natural systems, human intervention may facilitate adjustment to expected climate and its effects” (Field et al. 2014). It aims to moderate the impacts as well as to take advantage of new opportunities or to cope with the consequences of new conditions.

Adaptive capacity refers to the varying characteristics that determine how a climate event is experienced. It refers to the ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences (IPCC, 2014). The capacity to adapt is dependent on a region’s socio-economic and environmental situation as well as the availability of information and technology. Adaptive capacity can reflect the status of poverty, health, knowledge/education, and governance.

An **early warning system (EWS)** refers to “the set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss” (UNIDSR, 2007).

An **extreme (weather or climate) event** is the unusual, severe or unseasonal occurrence of a weather or climate variable at the extremes of the historically observed values; the range that has been observed in the past.

Climate change refers to a change in the average weather experienced in a particular region or location. The change may occur over periods ranging from decades to millennia. It may affect one or more seasons (e.g. summer, winter or the whole year) and involve changes in one or more aspects of the weather, e.g. rainfall, temperature or winds. Its causes may be natural (e.g. due to periodic changes in the earth’s orbit, volcanoes and solar variability) or attributable to human activities, e.g. increasing emissions of greenhouse gases such as CO₂, land use change and/or emissions of aerosols. Commonly, the term ‘climate change’ often refers to changes due to anthropogenic causes.

Climate refers to the average of individual weather conditions in an area, taken over sufficiently long periods of time.

Climate-smart disaster risk reduction (CSDRM) has been borne out the need to integrate disaster risk reduction and climate change adaptation. CSDRM is considered as the initial step to adapting to climate change and variability, providing policymakers with practical measures to allocate resources to reduce current and future risks at all levels (Mitchell et al. 2010; Davis-Reddy & Vincent 2018).

Climate variability refers to variations in climate on all spatial and temporal scales beyond that of individual weather events. This variability may be caused by natural internal processes within the climate system. One of the most important (and widely known) examples of

natural climate variability is the El Niño-Southern Oscillation (ENSO). Variations may also be caused by external influences which may be due to naturally-occurring phenomena (such as periodic changes in the earth's orbit around the sun).

A disaster is a serious disruption of the functioning of a community or society due to a physical event resulting in widespread human, material, economic or environmental losses that require immediate emergency response. A disaster is a negative outcome brought about by high vulnerability (or low adaptive capacity) in the face of exposure to an often sudden event. It is for this reason that an event of similar magnitude in one place may translate into a disaster, but in another may not, depending on the capacity of the population to cope.

Disaster risk management (DRM) refers to the “integrated multisectoral and multidisciplinary administrative, organisational and operational planning processes and capacities aimed at lessening the impacts of natural hazards and related environmental, technological and biological disasters” (Republic of South Africa 2015). Disaster risk management includes all forms of activities to avoid (prevention) or to limit (mitigation and preparedness) the adverse effects of hazards.

Disaster risk reduction (DRR) is defined as the process of “reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events” (UNIDSR, 2007). DRR includes all forms of activities to avoid (prevention) or to limit (mitigation and preparedness) the adverse effects of hazards.

Droughts may refer to “meteorological drought (below average precipitation), hydrological drought (low river flows and water levels in rivers, lakes and groundwater), agricultural drought (low soil moisture), and environmental drought (a combination of the above)” (Stocker et al. 2013). In this report, drought refers to the extended period of unusually low precipitation that produces a shortage of water (CRED 2015).

Exposure refers to the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected (IPCC, 2014).

Extreme temperature refers to both cold waves and heat waves (CRED 2015).

Floods refer to riverine, flash and coastal flood events and in South Africa are the result of tropical cyclones, cut-off lows, and thunderstorms which cause heavy rainfall and high runoff volumes (CRED 2015).

Global warming refers only to the overall warming of the Earth, based on average increases in temperature over the entire land and ocean surface. Climate change is more than simply an increase in global temperatures; it encompasses changes in regional climate characteristics, including temperature, humidity, rainfall, wind, and extreme weather events, which have economic and social dimensions.

A hazard refers to the physical parameters (e.g. rainfall or temperature) that may cause property damage, loss of livelihoods and services, economic disruption, or environmental

damage. A hazard can be incremental temperature or precipitation change, which unfolds gradually over a long time, or it can refer to weather-related hazards, such as droughts, floods and heat waves.

Impacts, in the context of this website, refer to the effects of climate change on natural and human systems (IPCC 2012).

Mitigation refers to the measures taken to reduce the emission of greenhouse gases and to enhance sinks (i.e. ways of reducing) of greenhouse gases.

Projection is a statement of a possible (hopefully likely) future state of the climate system dependent on the evolution of a set of key factors over time (e.g. carbon dioxide emissions).

Radiative forcing is a measure of the energy absorbed and retained in the lower atmosphere.

Representative Concentration Pathways (RCPs) are four greenhouse gas concentration trajectories adopted by the IPCC Fifth Assessment Report and describe four possible climate futures. The RCP's are named according to their 2100 radiative forcing level. There are four pathways - RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

Resilience is defined as the capacity for a socio-ecological system to (a) absorb stresses and maintain normal functioning in the face of external stress and (b) to adapt in order to be better prepared to future impacts (Folke 2006).

Risk refers to the likelihood of an adverse impact from an event. Risk is often represented as the probability of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur. Risk results from the interaction of vulnerability, exposure, and hazard (Field et al. 2014).

Sensitivity is the degree to which a system or species is affected, either adversely or beneficially, by climate variability or change. The effect may be direct (e.g., a change in crop yield in response to a change in the mean, range, or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to sea level rise) (Field et al. 2014).

Storms refer to tropical, extra-tropical and convective storm events as well as coastal storm surges (CRED 2015).

The **El Niño-Southern Oscillation** (ENSO) is a recurring natural climate phenomenon that is caused by abnormal warming in sea surface temperatures across the Equatorial Pacific is usually associated with high temperatures and below normal rainfall in the southern hemisphere.

Vulnerability is the “propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt” (Field et al. 2014).

Weather describes the set of meteorological phenomena we experience on a daily basis. Weather conditions might be sunny and hot, or cloudy and rainy. We expect changes in weather to occur from day to day.

Wildfires refer to any uncontrolled and non-prescribed burning of plants in a natural setting (CRED 2015). The occurrence of fires is closely linked with high temperatures and dry spells and are generally the result of deliberate or accidental actions of people (Forsyth et al. 2010).

Schedule A

TRAINING SCHEDULE

Day 1 ([DATE] [TIME])

[TIME] – [SESSION]: [DESCRIBE SESSION]

[TIME] – [SESSION]: [DESCRIBE SESSION]

[TIME] – [SESSION]: [DESCRIBE SESSION]

Day 2 ([DATE] [TIME])

[TIME] – [SESSION]: [DESCRIBE SESSION]

[TIME] – [SESSION]: [DESCRIBE SESSION]

[TIME] – [SESSION]: [DESCRIBE SESSION]