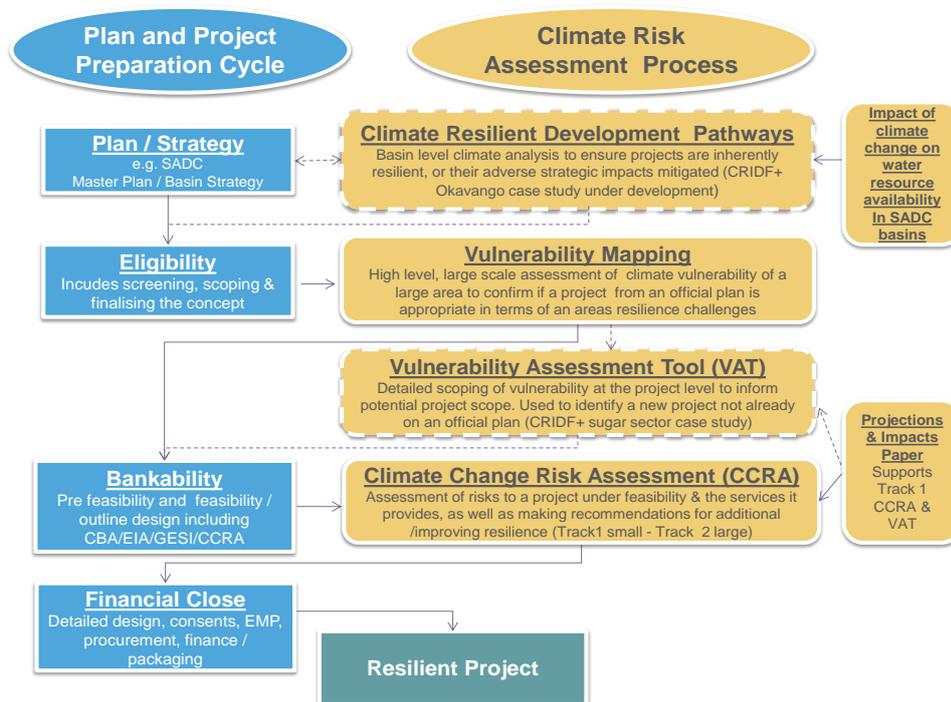


# Integrating Climate Resilience into Infrastructure Planning in Southern Africa

**CRIDF's tools for integrating climate risk and resilience thinking into infrastructure policy, strategy, planning, project preparation and implementation.**

## Background

CRIDF has developed a comprehensive suite of tools for understanding and assessing climate risk. These tools include assessment processes together with GIS mapping and preparation of region wide evidence bases to support these assessments.



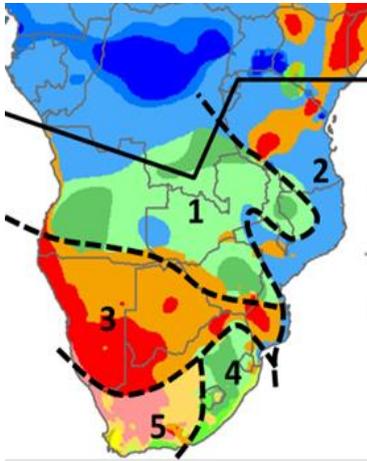
The figure above shows how CRIDF applies its various climate analysis and risk assessment tools within the planning and project cycles for water infrastructure. Applying the Climate Resilient Development Pathways (CRDP) analysis (currently under development) at an early stage in planning or strategy preparation, promotes development that is inherently climate resilient through adjusting the plan or strategy objectives along a more climate resilient path. Moreover, projects that enhance resilience are identified early and prioritised before too many decisions lock the plan and its constituent parts into a less resilient pathway.

## Applying the Tools

Integrating climate risk considerations into the preparation of infrastructure plans and strategies enables the project level analysis (the Climate Change Risk Assessment - CCRA) to focus on additional resilience benefits on top of an already inherently resilient project outline identified through the CRDP process. For example, the need for improved flood warning and / or management is identified and prioritised as part of the CRDP analysis. This can then be assessed further through the application of a project level CCRA to identify the additional resilience required to address future climate change. This will lead to a better understanding of the scale and scope of the flood

management challenge at a particular site, which can then be integrated this into an individual flood management projects detailed design.

This suite of climate resilience tools is supported by two documented evidence bases which are applied consistently across CRIDF projects.



1. **The impact of climate change on water resource availability in SADC basins** – this provides information on the future water availability in all the mainland SADC river basins.

2. **The projections and impact paper** – this provides a consistent set of projections broken down by 5 key agro-climatic zones in Southern Africa (see inset figure). It also contains high level information on the possible impacts of climate change on precipitation and temperature as well as extreme events, with a focus on the agriculture and health sectors.

This information provides some guidance and acts as a starting point for the project teams (including engineers, agronomists and water sanitation experts), to discuss climate change risk and impact on the projects they are preparing.

The CCRA is the primary project-level tool used to identify and assess risk to the project and its ability to provide services to beneficiaries, both currently and in the future. As part of that process, the inherent climate resilience of a project as well as the additional resilience incorporated during the detailed project design are clearly documented. The CCRA has been split in to two levels:

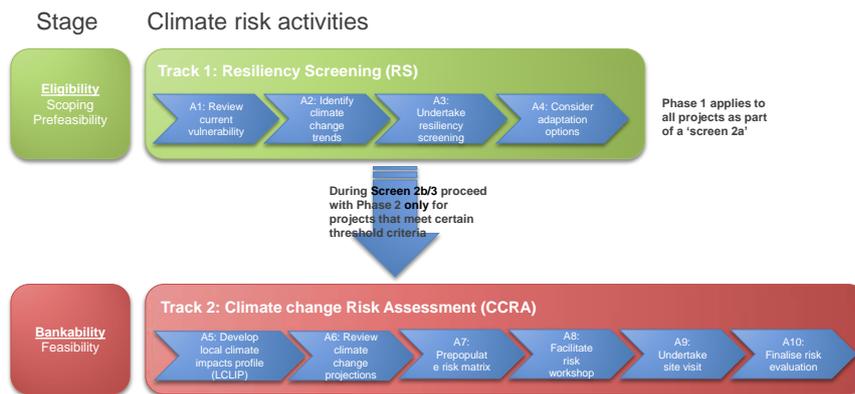
1. **Track 1:** small water infrastructure projects below £5,000,000 which makes use of CRIDFs Impacts and projects paper to enhance value for money.
2. **Track 2:** larger water infrastructure projects which include more detailed and bespoke analysis of projections and impacts and dedicated site visits by a climate risk expert

16 CCRA's have been conducted so far on CRIDF, three of which are Track 2s. The results from one of the Track 2 CCRA's are reported below.

## **Makonde Water Supply – Tanzania**

The primary aim of the Makonde Project is to expand and improve upon the current water supply scheme by increasing water production, expanding water distribution networks and building the capacity of both the local water authority and the target population to better manage water resources. The project is comprised of two stages:

- The “Immediate Measures” aimed at improving the performance of the current infrastructure.
  - The “Longer-term Measures” (Phase 1) are aimed at expanding the current water supply system and consolidating the supply to a single-source
- Due to the combined scale of these interventions it was deemed necessary to carry out a Track 2 Climate Change Risk Assessment. The activities undertaken are detailed in the Figure below.



The assessment considered the likelihood and associated consequences of current and future climate scenarios on a range of social, environmental, technical and economic risks. Desk-based research and analysis, site surveys, observations and interviews, and stakeholder workshops were used. The outcome of this assessment was a list of recommendations and targeted actions that would improve the immediate and longer term sustainability and resilience of the intervention. These added value to the technical designs, but more importantly also to the social (livelihoods and educational interventions) and institutional components.

The project team and key project proponents in Makonde found great value in both the CCRA process and the resulting recommendations. Most immediately, the team plans to take forward four key actions:

- As a first step towards better understanding groundwater recharge in the area, a water level **sensor** should be installed in the unused borehole at Mitema wellfield. This could later advance into a full **hydrogeological study** to better understand the relationship between temperature changes and lower groundwater recharge rates (as a result of climate change) in the area.
- Carry out a study to establish the **baseline ecological conditions** of the Mambi River. This will be monitored during the operation of the rehabilitated Mitema wellfield to assess the impact of the abstraction on the ecological health of the river system.
- **Enhance the environmental protection** of the Mkunya springs and Mitema Wellfields through community education activities and clear demarcation of protected areas.
- An investigation as part of the Immediate Measures preparation programme of **the power interruptions issue** and specifically to explore two options: 1) a dedicated renewable energy supply; or 2) the development of standby generator capacity.

## Strategic significance

CRIDF has developed a suite of tools to help planners, engineers and even local communities better understand the impacts of climate change on the implementation of new infrastructure. The tools combine a strong technical evidence base, with on the ground-truthing and stakeholder engagement. They are also designed to be 'fit for purpose' in terms of the stage in the infrastructure planning and implementation cycle and the size and complexity of the intervention.