CRIDF

PATHWAYS TO IMPACT

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Dam operating rules and community tools to ensure water for all in the Save Basin

In the Save Basin, water authorities are using new operating rules for more equitable allocation and systematic management of water. Rural communities are using reliable water resources to grow new crops, improve their health and incomes, and reduce pressure on the river system. Here, the positive connection between local projects and basin-scale management is clear.

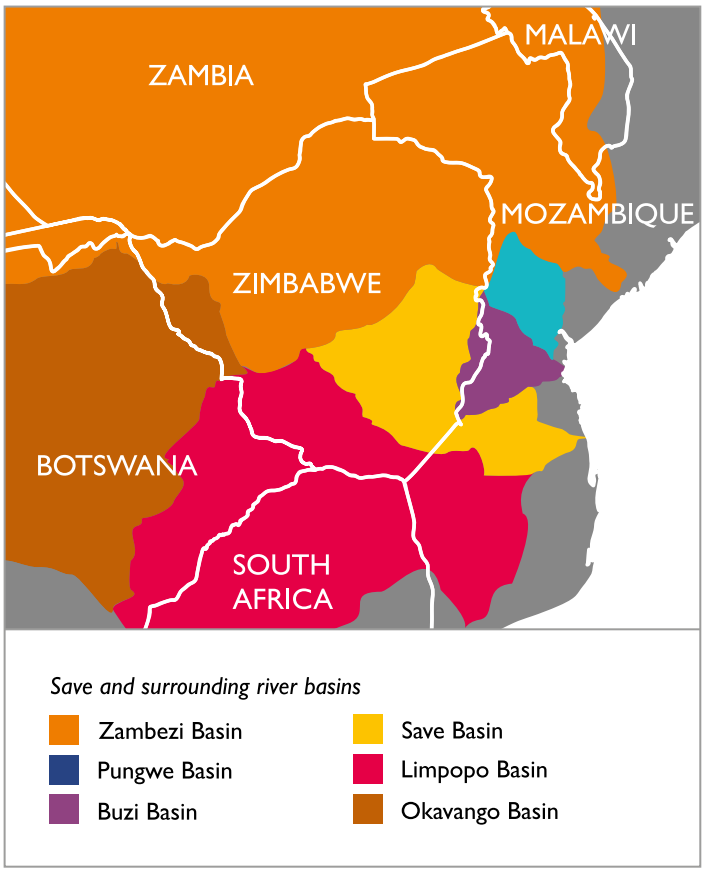
- Facing increased demands on water and less reliable rainfall, Mozambique and Zimbabwe asked CRIDF to explore how to support better joint management in their transboundary river basins, including the Save.
- Building on this request, CRIDF continued working with both countries to create a set of operating rules for existing water infrastructure in the Save. These rules use advanced modelling techniques to ensure equitable allocation of water resources in any given rainfall condition, and within a landscape of various competing demands.
- CRIDF provided technical assistance to water authorities on both sides of the border to help them use the operating rules, and to engage all basin stakeholders in the task of integrated resource management.
- Meanwhile, CRIDF managed two successful pilot projects in the communities of Bindangombe in Chivi District and Kufandada in Bikita District, showing that local-scale infrastructure enabled by solar pumps could drive sustainable economic activities without disturbing riverbanks or impacting the river system as a whole.
- The two pilot projects became a blueprint for a portfolio of similar possibilities in 50 communities across the Save Basin, which, if funded, will have a basin-wide effect, improving the equitable functioning of water infrastructure while securing livelihoods for thousands of rural households.

An uneven waterscape

The Save Basin is a catchment area of tributaries to the Runde River and the Save River, which raise complex issues for water managers as they traverse the border between Mozambique and Zimbabwe. In a region where rainfall has always been variable, the dry seasons are now becoming longer and less predictable. Even in years with ‘normal’ total rainfall, mid-season dry spells can cause crops to wilt, resulting in ‘droughts’ in a so-called normal year. And in some years, reservoirs in the Basin are full to the brim, while other years they stand empty. Water authorities in both countries therefore have to make difficult decisions about when to open dams and when to restrict water use, based on their best predictions about rainy seasons yet to come.

Amid these concerns, the large dams that supply cities and agricultural estates garner a lot of attention. Yet the Save Basin’s poor rural populations are often forgotten – and this has consequences. With few options to access water, people are forced to cultivate vulnerable riverbanks, even if this means breaking local laws. This cultivation exacerbates the

build-up of silt in rivers, which in turn can reduce the storage capacities of dam infrastructure and damage habitats in the river ecosystem.



Finding pathways

CRIDF first worked in the Save Basin at the conclusion of an earlier programme, the Southern African Development Community-supported and African Development Bank-funded Shared Water Courses Support Project. This project supported Mozambique and Zimbabwe in developing a joint integrated water resource management strategy for the Save Basin and two other transboundary basins, Ruvuma and Buzi. The two countries asked CRIDF to support the implementation of a number of components from within this strategy.

An integral part of this work was the identification of a programme of community-based water management projects (CBMPs) to be implemented under the joint strategy. The programme chose Bindangombe and Kufandada as demonstration sites. In addition to protecting water resources, CRIDF extended support on the community projects to include setting up institutional management structures (committees), providing access to markets and training farmers to help them move from subsistence to semi-commercial activities.

These initiatives together resulted in an overall upgrading of community livelihoods and consequently embedded the sustainability of the investments. In cooperation with the United Nations Development Programme (UNDP), CRIDF assisted the Government of Zimbabwe in preparing a proposal comprising 50 other CBMPs for funding by the Green Climate Fund. Furthermore, CRIDF is at the early stages of formulating support for a similar World Bank-funded IRRIGA project in Mozambique. This IRRIGA project targets development totalling 3,000ha of CBMPs.

The right tools

Modelling-based operating rules

CRIDF created the first set of operating rules for the Save Basin – a management regime for using existing infrastructure on both sides of the border to ensure equitable access to water by all users. The basis for these rules is an advanced modelling platform with simulation engines for month-by-month flow optimisation, risk analysis, and a water resource yield model. The operating rules also created a platform for sharing of real-time water resource data that was a first between the countries.

Technical assistance for integrated management

The two water authorities managing parts of the Save – the Regional Administration of Water in Central Mozambique (ARA-Centro) and the Zimbabwe National Water Authority (ZINWA) – both received technical assistance to comply with the integrated water resource management strategy the countries were developing. This prepared them for implementing the operating rules and prioritising investment for the future.

'With a phenomenon like siltation, if you stop it on a local scale but it is still happening everywhere else in the Basin, it doesn't really change anything. The dams will still become silted. If you are addressing it across the Basin, you are making a change.

The impact of the isolated projects in Bindangombe and Kufandada is that people see this is a good thing and want to do it elsewhere. But that does not mean much if they lack the funds. So, we chose to package other projects like these and do them on a large scale. The two small projects are like seeds we planted, and the big plant that grew is the application to the Green Climate Fund. It is climate resilience on a basin-wide scale, impacting thousands instead of a few hundred vulnerable households, while promoting resource protection. And it demonstrates a symbiotic relationship between human beings, water bodies and infrastructure.'

Leonard Magara
Chief Engineer, CRIDF

Portfolio financing approach

CRIDF's management of two community-based projects in the Save became a start point for bundling together many similar investments for local resilience into a larger portfolio that is finance ready and promises to have positive effects at the basin scale.

Rules for equitable access to water in dry times

In a basin with unreliable rainfall, water managers have to take an active hand in predicting the future and managing flows. Rising water demands must be answered in the long term by developing more infrastructure, but this is a decades-long process; the more immediate need is to fairly and efficiently distribute water from the 60 or so dams already standing in the Save.

Such is the role of the operating rules, which optimise the sharing of available water. Based on computer modelling of the whole basin system, the rules maintain a view on the seasons ahead – with their ever-present potential for drought – and on users downstream. They allow water managers to plan for releasing water from dams in some parts of the Basin to settlements in others, when it is most needed, and by moving water downstream rather than pumping it upstream. While droughts are still difficult times for all, equitable access enhances trust and means that people are more likely to share and conserve their water.

Along with designing the operating rules, CRIDF helped the Mozambican and Zimbabwean authorities put them into practice. Technical assistance, including workshops, training and study visits between the two countries, allowed both authorities to build their capacities in new areas. Assistance to strengthen wider engagement in basin management led to the formation of a Save Basin stakeholder committee in Mozambique – a big step in promoting equitable transboundary management with a stronger sense of waterway ownership among all users. The two countries also formed agreements on regular information sharing and a computer modelling package to support the use of the operating rules, as well as to plan further development in the Basin.

Transformational change

With the operating rules in place, Mozambique and Zimbabwe can now turn their attention to the future of the Save Basin. The countries understand that this future needs to include all rural communities, supporting their sustainable livelihoods and building their resilience to climate change.

In the two communities of Bindangombe and Kufandada, CRIDF has shown exactly how this can be done. In Kufandada, the pilot project introduced solar-powered pumps and water storage, while both sites introduced irrigation for fields, and safe water and sanitation for local households. With their water supply no longer a matter of chance, the residents of the two communities quickly began to generate income through small-scale commercial farming. Importantly,

these farming developments have taken place away from riverbanks, ending the erosion and siltation that had resulted from bankside farming in these areas. Bindangombe and Kufandada are just two isolated communities, but using their success as a blueprint, CRIDF identified a further 50 potential projects in the Save Basin. It then helped the Zimbabwean government to bundle these into a single funding portfolio with the additional support of UNDP. The result is a proposal, submitted to the Green Climate Fund in September 2018, that could mobilise US$35 million to improve the livelihoods of thousands more people and restore the environmental prospects of the Basin. This is considered the first phase for a programme that will total up to US$100 million.

Lessons learned in the Save

- Transboundary cooperation in shared waters supports peaceful management of shared basins, particularly as the service is based entirely on the needs of country governments and their desire to work together on transboundary issues.
- Operating rules mitigate water allocation problems by providing guidance on the optimal operation of river infrastructure for the equitable and climate resilient management of water resources. When paired with organised stakeholder engagement, these rules also promote a widespread sense of waterway ownership.
- CRIDF's intervention can create spaces for dialogue and cooperation, particularly when technical assistance includes water authorities on two sides of a national border. In the Save, Mozambique's ARA-Centro and Zimbabwe's ZINWA have come closer together through study tours, enhanced information sharing, and training in the same modelling software.
- Successful pilot projects in support of local livelihoods are not enough to effect basin-wide change on their own, but they can form blueprints for larger portfolios of projects that have transformative potential for communities and the basin environment.

> *'We had poor harvests due to poor rainfall, with two years of drought prior to the scheme establishment. We were getting water for cooking, washing and drinking from shallow wells and rivers, which caused diarrhoea. We are now selling crops and getting income to improve our lives: to pay school fees, buy clothes, etc. The income has helped widows too. And our diet is also improved with new crops like sugar beans.'*
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> **Women's focus group comments at Kufandada Irrigation Scheme**

ABOUT CRIDF

The Climate Resilient Infrastructure Development Facility (CRIDF) is a DFID (UK Aid) supported programme working to provide long-term solutions to water issues that affect the lives of the poor in Southern Africa. Our focus is to work together with organisations to show them how they can better build and manage their own water infrastructure to improve people's lives. Because rivers, lakes and river basins cross borders, CRIDF is working with 12 different countries in Southern Africa that share water resources. In so doing, CRIDF aims to improve the lives of over 200 million people, many of them extremely poor.

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