

Coordinating to halt the damage of floods in the Lower Incomati Basin

A productive, but flood-prone, Mozambican river basin presents a challenge for its diverse private and public stakeholders. Working in coordination with a shared set of tools has brought them together to consider a less vulnerable future for all.

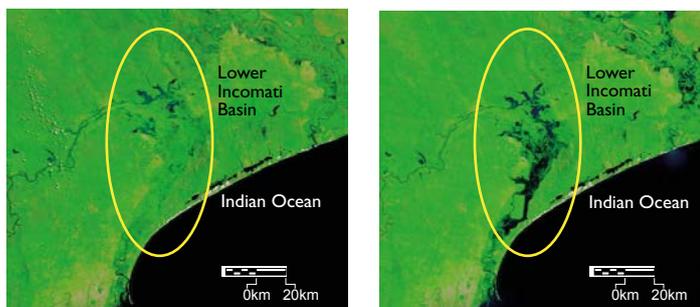
Sugar and water

Lying at the downstream end of several major Southern African river basins, Mozambique is highly vulnerable to flooding, which strikes every year to some extent and some years to a very destructive extent. The Lower Incomati Basin is one area that is trapped between coastal water surges and significant flood waters from the rivers in the upper areas. The resulting floods hit smallholder farmers and communities living in the floodplain especially hard – and due to climate change, the worst floods are coming more often.

The Basin is also where most of Mozambique's sugarcane is grown, and the sugar estates have experienced more flooding recently, too. These private companies have the resources to raise their flood dykes higher and higher to avoid flooding of their sugar estates, which is what they have been doing. But without looking at the bigger picture, this only worsens the situation outside of the estates and

- CRIDF provided strategic support to Illovo Sugar and the nearby sugar estate operated by Tongaat Hulett (the two largest private employers in the Lower Incomati) to recognise a need for a different approach to their flood mitigation, beyond the continual raising of flood control dykes around their sugar estates. They turned to CRIDF as a trusted neutral partner to better understand their risks.
- Using hydraulic flood modelling to inform an engagement and vulnerability assessment, CRIDF built a cost–benefit case for infrastructural approaches that will allow for better sharing of risks and increased resilience for different groups in the face of climate change. CRIDF effectively introduced a holistic approach to flood risk management in the Lower Incomati.
- CRIDF brought private and public stakeholders – the sugar estates, their outgrowers, and national and local government agencies – together in a project steering committee that has developed into the de-facto flood management committee for the Lower Incomati Basin.
- By working together in the steering committee and implementing the approach of vulnerability assessment, stakeholders adopted a change in thinking about risk. They began pursuing infrastructure solutions that would allow for the equitable sharing of risks and financial benefits.
- CRIDF scaled up this project to enhance cooperation with the larger transboundary Incomati Basin in Mozambique, South Africa and eSwatini by implementing an early warning flood forecasting system for the entire basin, which is live on a website that can be accessed by all.
- The success of this project enabled CRIDF to influence and provide strategic support to Illovo to introduce a climate resilience approach to planning in other estates operated by Illovo in the SADC region.

harms other growers and communities. Illovo Sugar, Africa's largest sugar company owned by Associated British Foods, realised that they couldn't resolve the issue on their own. They asked the Climate Resilient Infrastructure Development Facility (CRIDF) to help them find ways of protecting their estates without unintended consequences for others.



Satellite images taken before and during 2014 floods in the Lower Incomati Basin. Source: MODIS

Finding pathways

CRIDF began its intervention with a close analysis of the Lower Incomati Basin through two data-rich methods. The first was a 2D hydraulic river flood model of the Basin, used to simulate the extent of flooding under the worst conditions that are likely to occur within 5-year, 10-year and 20-year periods. The second was a vulnerability assessment that mapped the different types of farms and estates in the area to understand how severely they would be affected by these floods.

This research showed something surprising: in hydrological terms, the frequently submerged areas did not have a flooding problem, but a drainage problem. Some of this was due to the sugar estates themselves, which block water from reaching the river. Among those being flooded were many of the outgrower farmers who sell their sugarcane to Illovo and Tongaat – meaning that the companies' flood defences were impacting their own business.

CRIDF proved, using an engineering and economic approach, that restoring a river embankment 200m in length and 4m high upstream of the Tongaat Hulett sugar estate, as well as installing flood control gates, could change the direction of waterflow during smaller flood events. CRIDF concluded that this will

significantly reduce the impacts of flooding for over 50,000 households in low income communities, including many outgrowers. The project also proved, through a financial decision-making tool developed by CRIDF, that if the sugar estates invested in the flood risk management infrastructure there would be significant economic and financial benefits for all parties, especially the outgrowers and local communities.

The right tools

Flood modelling and vulnerability assessment

By combining a hydraulic model with vulnerability mapping in the Basin, CRIDF was able to demonstrate the economic and financial benefits of shared flood risk management. Illovo and other stakeholders used the model results to identify and compare flood risk mitigation measures.

Public-private steering committee

Realising that success required the cooperation of multiple stakeholders, CRIDF established a public-private steering committee chaired by ARA-Sul, the government body managing river operations, with the sugar estates and their outgrowers as key participants. The committee soon grew to include the national roads agency, national electric company and the Manhica Local District Planning and Infrastructure division. This has become a de-facto flood management committee for the Lower Incomati Basin.

The cost-benefit case and mobilisation of funds

The public and private partners are now working with CRIDF to mobilise funds for the more equitable sharing and management of flood risk, based on informed calculations of costs and benefits. Illovo diverted their own resources and EU funds away from building higher flood defences and towards a risk-management solution that combines infrastructure with allowances for certain areas to flood. Based on CRIDF's work, £4.7 million is being mobilised to improve climate resilience for the poor in the Lower Incomati Basin.

A choice of modelled interventions

CRIDF's tools meant that stakeholders could consider different infrastructure options – such as new protective structures, dredging and adaptations to road infrastructure – with a common, informed understanding of their risk outcomes for vulnerable areas and groups. These will be supplemented with regional-scale solutions such as developing real-time flood forecasting with increased cooperation between Basin countries and working with Illovo Sugar to roll out a more sophisticated risk sharing approach with its outgrowers across its six Southern Africa countries of operation.

“We are British owned, and the Southern African countries we operate in are all part of the Commonwealth, so there’s quite a strong natural association back to the UK government and DFID in particular. We have a pretty open and free exchange of information.

[CRIDF] know what we do, and we try and understand what they do and how we can help them. In this particular project they had access to a whole lot of fantastic modelling capability that we couldn’t hope to have in our business. Sometimes we stumble upon these sweet spots of mutual benefit, and we always work to find them. The project in the Incomati River Basin is really a brilliant example of that.”

— Gavin Dalgleish
Group Managing Director, Illovo Sugar Africa

become a de-facto flood management body; in participatory workshops with outgrowers; and in Illovo corporate meetings.

It was also essential to show the specific ways in which a public–private consultative approach could benefit all parties. Over time, the perspective on benefits grew from individual stakeholders’ bottom-line concerns to the wider impacts of their choices. For example, the national roads agency will be using the flood models to design roads that will minimise flooding impacts on local communities. Illovo itself raised funds from the EU to contribute to a fine-grained LiDAR elevation mapping of 1,300km² of the Basin; while this has benefited them in better supporting their outgrowers with irrigation planning, the partners have released this valuable data to the public domain for use by government planners and NGOs.

Transformational change

When Illovo first approached CRIDF, it was to help with better managing flooding in their own estate. By the end of the project they were thinking about how to support communities throughout the Lower Incomati and other basins where they work. This change was catalysed by Illovo’s collaborations with CRIDF and other stakeholders. The Company also considers it to be a direct outcome of working with CRIDF’s vulnerability assessment tool, which made visible the need to systematically address severe climate vulnerabilities throughout the Lower Incomati Basin. Climate resilience aspects are now being mainstreamed in Illovo’s outgrower strategy across six countries, something the company acknowledges had not been done in a structured way before.

Bringing stakeholders along on the journey

The Incomati project was a success in using discussions about infrastructure as an opening to involve private and public stakeholders in a journey towards a more balanced distribution of future flood risks, with benefits that increase the resilience of small-scale farmers. CRIDF achieved this by involving itself and the stakeholders at every engagement: in the steering committee, which has



The project's impact is also being scaled up by CRIDF itself with subsequent work on a regional, transboundary approach to promoting pro-poor climate resilience. CRIDF is enhancing cooperation and progressing dialogue through the entire Incomati Basin (upper and lower) in eSwatini, Mozambique and South Africa. This opens up new possibilities such as a real-time flood forecasting system and a dam operation framework, which could benefit hundreds of thousands of people who share the Basin, its risks and its resources.

Lessons learned in the Lower Incomati Basin

- A team of impartial experts can mobilise companies and government agencies for shared action to face the impacts of climate change. Bringing these partners into a multi-stakeholder forum created a team of key players – including small outgrowers – committed to the future of the Basin.
- Tools with a wide geographic scope enable water competitors to work together and choose the best solutions for themselves and communities in their floodplain. This project's tools, from hydraulic modelling to LiDAR imagery and technical support, provided good infrastructure options while also building trust.
- The special vulnerabilities of smallholder farmers can be much better addressed in basin-wide approaches when these vulnerabilities are rigorously analysed by outside experts; when smallholders themselves are included in planning; or, ideally, both.

“Sugarcane needs hot, humid conditions, which generally pushes it into more remote and climatically vulnerable areas. Of course, as a company you address the climatic conditions for the business, but increasingly you’re recognising the pressures that they put on the communities around, and you can’t easily run a successful business if you’ve got unhealthy and struggling communities around you.”

CRIDF helped to identify where blockages were stopping the natural flow of water, which is why the floods were getting worse each year. And because it engaged with the government and brought in all different sectors, it worked really well to address it all on a longer-term basis. It was really helpful to get everybody around the table.

All of these things, the climate resilience approach, the water management programme, the grower engagement and going for a more participatory approach, which the CRIDF work also helped with, has shaped how we now approach development.”

— Kate Mathias
Illovo Group Development Consultant

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.

