TETRA TECH
International Development

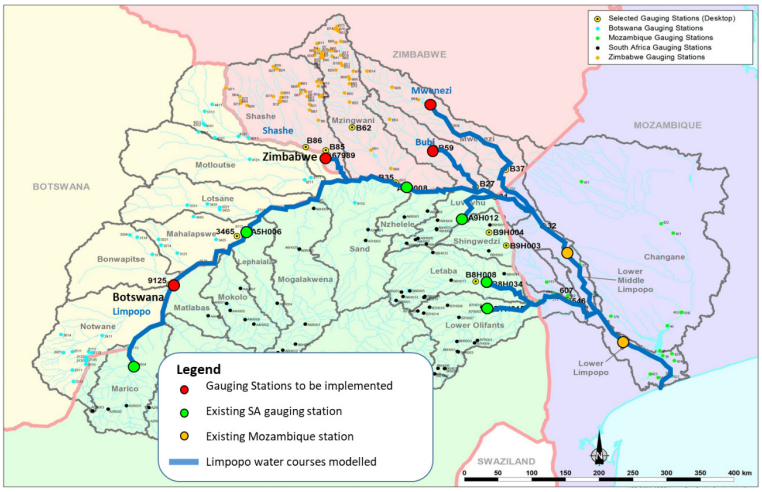
Fighting flood damage in the Limpopo River Basin with early warning systems

The CRIDF-supported development of an early warning flood forecasting system (EWFFS) for the Limpopo River Basin is protecting lives and livelihoods across the region.

Author: Jonathan Barnes
Technical Advisor, CRIDF

The Limpopo River Basin is a rich ecosystem that spans the borders of Botswana, Mozambique, South Africa and Zimbabwe. From South Africa and Botswana, the river flows eastwards, combining with tributaries from Zimbabwe, descending to the floodplains of Mozambique and emptying into the Indian Ocean.

Some 20 million people live within its watershed – and as many as 1.5 million of those people have their lives regularly upended by major flooding events. With climate change increasing the frequency and intensity of these events, the communities also have to endure increased loss of life, infrastructural damage, hardship and economic losses.



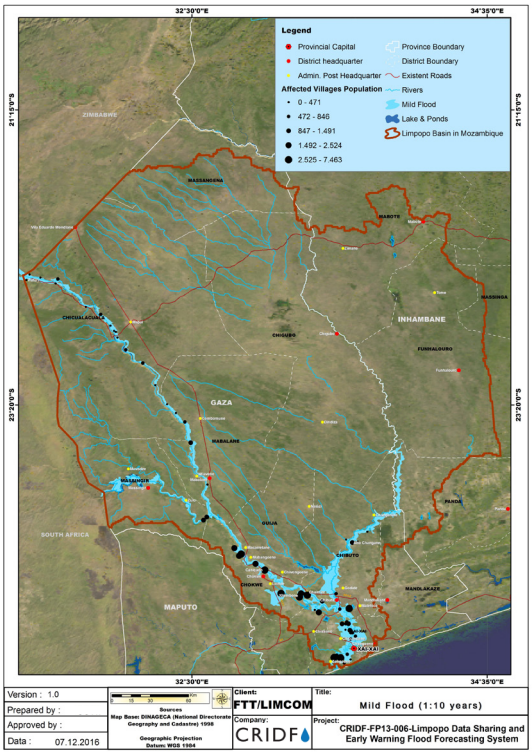
Limpopo River Basin showing the extent of the early warning flood forecasting system

An opportunity for early warning

There was a clear opportunity to establish an early warning flood forecasting system (EWFFS) for the river basin, which would use near real-time data to mitigate the flood damage and limit the loss of life. Designed as a transboundary system, it is used by all four member states, under the coordination of the Limpopo River Basin Organisation (LIMCOM).

The Limpopo Basin flood forecasting early warning system connects to weather and information systems data across the four countries and informs management actions to prevent damage and move communities out of harm's way. It also serves to benefit major economic activities along the basin including agriculture, mining, forestry and tourism, by allowing communities, smallholder farmer, agri and other businesses to prepare for and measure the impact of flooding events at different locations of the river basin.

Developing an intervention



Between 2014 and 2017, the Tetra Tech-managed Climate Resilience Infrastructure Development Facility (CRIDF) worked with LIMCOM and the basin's member states to develop a pilot EWFFS system and the accompanying training. The system, funded through CRIDF by the Foreign and Commonwealth Development Office (FCDO), is operated via a website and produces flood magnitude data in real time in a reliable cost-effective manner.

The development of this system saw our CRIDF team work with LIMCOM to build key partnerships with other development cooperation partners in the basin including the GIZ community flood warning programme and the USAID funded Resilient Waters Programme in the Limpopo Basin. Our other strategies included developing relationships with the agricultural sector in Mozambique and working closely with the government departments managing the rivers in each of the four riparian countries of the Limpopo.

With one eye always on the sustainability of the EWFFS, we also developed a business case for investment in the system and carried out analysis on the significant economic benefits of commissioning the system.

Since 2018, the EWFFS system has been developed further with the member states adapting the system to suit the needs of LIMCOM and the member state government departments responsible for flood risk management.

Over a five-year time period, the costs of running the system amount to £100,000, against damage reduction benefits of a minimum of £1m.

A sustainable future

We gave significant consideration to the sustainability of the EWFFS system during the design stage. The software and weather information and river gauging systems were robust and relatively inexpensive. Operational costs such as data transmission and maintenance are low and designed in such a way that will make it straightforward to check the system is giving plausible results and keeping it maintained.

This business case provides a framework for assessing the associated costs and benefits of implementing the Limpopo EWFFS. The business case for investment quantifies the benefits of such a system by quantifying the reduction in costs that could result from having an early warning provided to potential communities impacted by floods. Operational and maintenance costs of the system are approximately GBP 20,000 per year, and the benefits in flood damage reductions using the system are a minimum of GBP 1 million every five years.

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107 Gray's Inn Road, London WC1X 8TZ, UK
+44 (0) 20 7837 2881 | intdev.tetratecheurope.com

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