CLIMATE RESILIENCE

Growing resilience in Giyani: How climate-smart water projects are transforming rural livelihoods

In Limpopo's drought-prone Giyani, a water resilience programme is changing lives. From solar-powered pumps to climate-smart farming, local co-operatives like the Ngambas are proving how community-driven innovation can turn water scarcity into opportunity.
Article by Matthew Hattingh.

Teacher-turned-market gardener Delina Ngamba has been on something of a learning curve in recent years and her newly-acquired skills are bearing fruit. Swiss chard, spring onions and other leafy vegetables grow in abundance on the little co-op farm she and her husband run near Giyanyi, in north-eastern Limpopo.

"We see… modern farming methods and tools are the future [for] our communities because you do not have to worry about removing weeds, having back pains while working, and using too much water and land," says Ngamba.

The bountiful harvests (and relief for weary bones) are thanks to lessons in hydroponics, ridge and furrow techniques, bag-planting, and water-quality testing, made possible by the Giyani Local Scale Climate Resilience Programme, which also financed the equipment to keep 0.5 ha irrigated on the 7ha Matsambo Ngamba Agricultural Co-operative farm. This included a solar-powered groundwater pump, solar panels, distribution pipes and booster pump, drip irrigation system, a modular wastewater-to-irrigation-water treatment plant, filter, and a reservoir.

The Ngambas are among an estimated 6 620 Giyani beneficiaries of the programme, which ran from January 2022 to December 2024. Funded by the Government of Flanders, Belgium, the programme was managed and implemented by the Water Research Commission, the Association for Water and Rural Development (Award), Tsogang Water and Sanitation, and the University of the Western Cape. It sought to prepare communities and officials in the Greater Giyani Local

Municipality of the Mopani District to better cope with the hotter, drier conditions climate change was expected to bring.

The aim was to help people find ways to use and share the region's limited water resources more effectively and fairly, with initiatives to build skills, engage with policymakers and develop relations with different levels of the government and local water authorities. The programme had three main areas of focus: individual economic development (the Ngambas being a good example); community development, focusing on improving access to more water sources; and helping government institutions to improve water services.

This is detailed in ***Building an enabling environment for rural climate resilience within local government Under the Giyani Local Scale Climate Resilience Programme*** **(WRC Report No. 3222/1/25)**. Published in August, the report is the work of the Award's Derick du Toit, Tebogo Mathebula, Thembhani Mabunda and Basani Ngobeni.

Giyani, the former capital of the Gazankulu homeland, is about 30 km as the pied crow flies to the Kruger fence line and roughly equidistant to the national park's Phalaborwa and Punda Maria gates. It falls within the Mopani District Municipality, much of it pretty dry country. In 2009/10, for example, when the level of the Middle Letaba Dam, one of Giyani's most important stores of surface water, plummeted, a disaster area was declared. The crisis reminded "planners of the importance of resilience planning and climate change preparation".

Planning and preparation are sorely needed in the region – implementation and maintenance too. The report shows governance failings and other ills slowing the rollout of bulk water infrastructure and services in Giyani. The municipality's existing dams, reservoirs, reticulation networks and borehole pumps are woefully insufficient for its urban and rural residents and its mostly subsistence farmers. Villages are scattered, and consumers often struggle to pay for water services, with unlawful connections and vandalism a common problem.

With no reliable water sources, most people in Giyani do with less than 25 litres per person per day, barely sufficient for very basic domestic needs. People rely on too few sources of water – a big part of the problem, so finding ways to diversify sources was among the programme's main goals.

Another goal was to promote the Multiple Use Water Services Model, an approach to water planning and provision that emerged internationally in the 1990s. This model says managing water for a single purpose, be it domestic use or irrigation, doesn't make the best use of the resource and sells the poor short. The model focuses on small-scale community practices while encouraging household economic advancement.

Agriculture is the biggest user of water and the biggest employer in Giyani, which is not to suggest formal jobs are plentiful. About 60% of the population is unemployed and 78% have no individual income. The authors felt capacity-building initiatives, including assisting Giyani residents to better understand the model's value as a response to climate change could improve access to water and its responsible use.

"In time, it is hoped these improvements will reflect in the community's ability and willingness to maintain water infrastructure and to pay for (possibly subsidised) water services," they said. The report explained that by securing a reliable water supply, crop and livestock yields could be lifted. Here, the programme intervened directly, providing water-quality testing and by equipping existing boreholes with solar-powered pumps, such as on the Ngamba's co-op.

However, if a virtuous development circle is to develop, where investment stimulates economic growth, in turn funding further development, the maintenance and operation of water-supply systems will need to improve. Water dialogue events in the region often highlighted maintenance and operations as key obstacles to improved water services. The report attributed these issues to a shortage of skilled staff, technical resources, and failures in budgeting, planning, and asset management. The report suggests involving communities in water system decisions to foster ownership, boost care, and reduce theft or vandalism. This approach could also increase scrutiny of municipal officials, promoting accountability. Further benefits may come from piloting community co-ownership or co-management schemes, as seen in places like Limpopo.

The Mopani Municipality, the region's water services authority, is hard pressed to meet its responsibilities for the operation, maintenance and efficient use of bulk-infrastructure. Sharing some of the burden with households, small groups and volunteer-run local committees, could ease the strain on the authorities, the report said.

Local committees could monitor neighbourhood water systems, including boreholes, pumps, rainwater harvesting, and small supply schemes. They could handle minor repairs, help collect fees, and enable residents to report issues quickly, reducing downtime and using local expertise. This should help the municipality eke out operations and maintenance budgets further, while it continued to provide technical backup and regulation and remained responsible for major infrastructure investment.

To foster self-supply and increase the role of individuals and communities the programme focused on co-management

Innovative agricultural techniques, such as bag-planting, has boosted agricultural productivity at the Matsambo Ngamba Agricultural Co-operative farm.

Green peppers being prepared for the market at the Ahi Tirheni Mqweka Agricultural Primary Cooperative. Among others, this cooperative benefited from a hybrid solar system, water storage, and pumps for existing boreholes.

agreements; village water infrastructure savings associations; and solar-powered boreholes. We will touch on some of these while drawing on case studies that document the programme's work with agricultural co-ops and community water supply projects.

The Ngambas show that co-ops can respond well to supported self-supply initiatives. Members of the Macena Primary Agricultural Cooperative, 35 km south-east of Giyani, said they were grateful to be part of the initiative and that the solar-powered pump, panels, tanks, piping and drip irrigation lines installed on their 17.5 ha farm had been a boon: "Our solar is working perfectly," said representatives of the co-op. They suggested additional storage capacity and an alarm to alert them to over pumping and to protect the pump from theft would also help. They said the programme taught them the importance of regular water-quality testing, locating cattle kraals away from water sources, and carefully managing water resources.

Patrick Sekhula, director of the Duvadzi Youth Organic Primary Agricultural Cooperative, valued the water quality-testing done on their 5ha family farm, and the installation of a solar-powered pump, reservoir, related piping and equipment, and like all the programme installations, metering. Here, the co-op keeps 0.5ha under irrigation, growing tomatoes, okra, onions, butternut, green peppers, baby marrows, cabbage, spinach and maize. Produce is sold to neighbours and local vendors, Giyani supermarkets and national markets.

"The programme has been good to us. The solar system it provided has been so helpful because we no longer rely on (grid) electricity and we are able to pump during load-shedding," said Sekhula.

He was concerned about sharing a metered borehole with a neighbouring community. A valid concern, as Giyani's rural communities face poverty, limited water infrastructure, and minimal oversight, relying mainly on volunteer borehole operators and nascent water committees. "Whilst farm pilot sites took ownership of the project, village pilot sites found it more challenging to coordinate themselves," the report notes.

At the time of the study, 2 302 residents of Matsotsosela, a village 48 km south-east of Giyani town, relied on two municipal boreholes. Villagers, many of whom survive on social welfare grants and selling mopani worms in season, must take care to purify the borehole water, lest they develop diarrhoea or break out in a skin rash. Thanks to the programme, though, at least one of the working boreholes was more reliable, with a solar-powered pump and a 2 500 litre tank.

In the neighbouring Mayephu, where unemployment stands at 70%, times are tough too. Although the village's 1 940 residents received assistance from the programme, their new system was incomplete when a case study interviewer called. "We can honestly say nothing is working in our solar system and the system needs to be improved," said Lilly Ntlhamu, chairman of the local water committee.

Du Toit told ***The Water Wheel*** these were installation hiccups that were soon remedied. "Co-management between farmers, communities and the municipal district municipality is crucial where multiple user types are present. This should be formalised with written agreements and supported by the establishment of village water committees," the report said.

Concerns included reliance on the municipality for system upkeep and ongoing infrastructure funding. The report also noted public resistance to innovations like reverse osmosis, metering, tariffs, and technology-based monitoring.

Despite these and other teething problems, the authors were optimistic about supported self-supply: "It is a transformative model that bridges policy with community-led action, ensuring the right to water becomes a reality, even for the most remote communities".

The programme proposed addressing funding difficulties through village water infrastructure savings associations. By pooling small, regular contributions from villagers, associations can fund minor repairs and tackle urgent maintenance. In most cases, committees are doing this anyway.

A model for formalising this is being investigated. The authors felt the model would build resilience to breakdowns and climate change, and suggested the municipality fund mentorship or seed grants to help saving associations get going.

A big part of the programme involved efforts to build institutional backing for the model. The authors pointed out that

introducing innovations in rural municipalities can be difficult for a host of technical reasons, including the sheer distances involved and the way villages are scattered. Tough institutional hurdles included: "entrenched legacy systems; siloed governance structures; professional resistance to non-traditional approaches; political caution; limited resources; leadership turnover; and skills gaps."

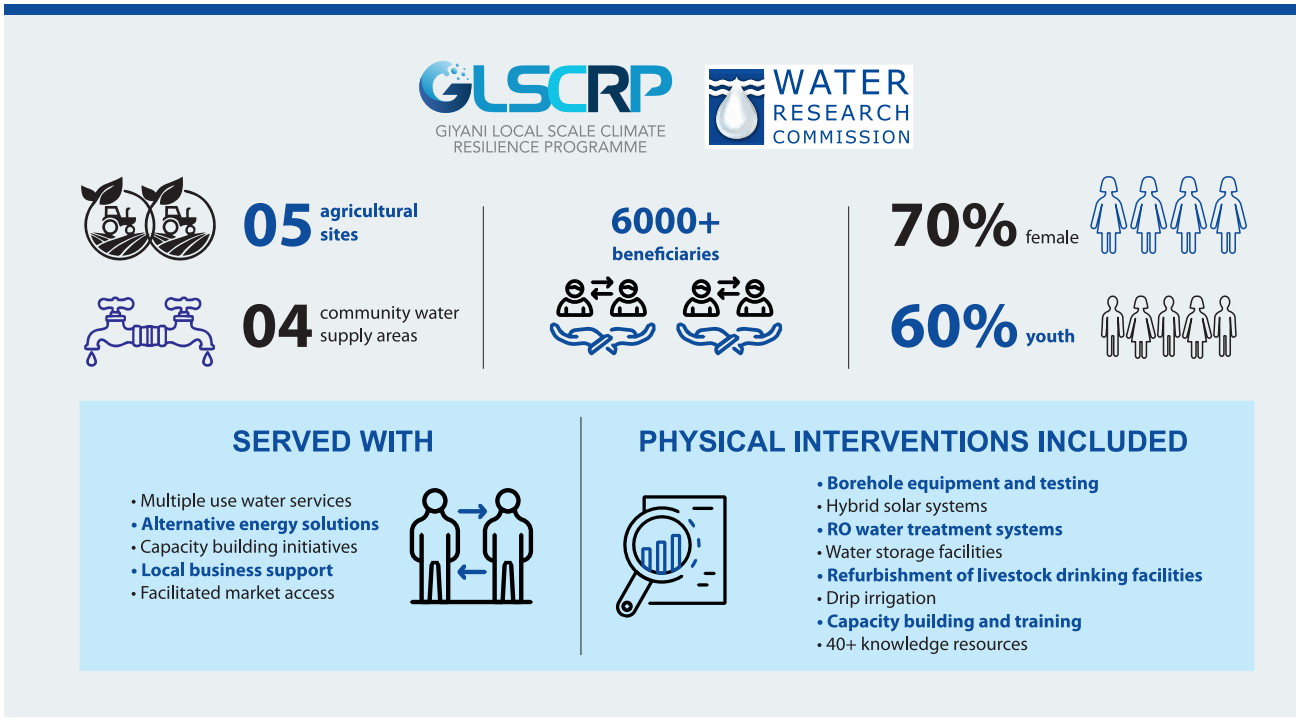
The authors proposed drafting formal co-management agreements with community water committees, ward councillors, and local contractors to clarify roles, build trust, ensure legal recognition, and align with broader water and development plans.

The report highlights that "institutional adoption" is vital for the model's sustainability, recommending stronger information sharing and collaboration among officials, councillors, water professionals, and communities. It emphasises the importance of securing ongoing political support for technical solutions and calls for regular engagement with political leaders and positive relationships across government and community levels.

Memoranda of understanding, letters of collaboration and terms of reference documents were drafted and signed by the programme partners and different arms of the provincial and local government, including water service authorities. The report also detailed engagements with council structures, including introductory meetings and sessions with portfolio committees, to build trust and a foundation for collaboration, in other words, to "secure a seat at the table", for the programme.

This set the scene for a process of innovation research, evidence-building, and protocol negotiation, ensuring alignment with legal mandates. Pilot schemes and formal handovers were seen as important ways to refine new practices and support lasting success. To help establish climate-adapted water management as the norm, the programme engaged with local political and organisational cultures and identified influential champions within key groups to drive change.

"The process of building enabling environments was thus not about dictating change from the outside, but about being a credible partner in the evolution of local governance, providing support to guide officials and decision-makers toward more adaptive and resilient practices."



The Giyani Local Scale Climate Resilience Programme in numbers.