Building Localised Climate Resilience in KwaZulu-Natal: the uMhlathuze Water Stewardship Partnership

The recent devastating floods in KwaZulu-Natal, and ongoing drought in Gqeberha, demonstrate the scale of natural disasters that we are up against.

Natural climate variability is being intensified by climate change, resulting in more frequent and intense droughts and floods. Extreme weather events are exposing challenges in our built and natural infrastructure, planning and ability to adapt. The cost to the economy and livelihoods is huge.

In Northern KwaZulu-Natal, dealing with drought and extreme weather is nothing new. Since its formation in 2016, the uMhlathuze Water Stewardship Partnership (UWASP) has been working to adapt and mitigate these issues, within the constraints of a pandemic.

What began as a common focus on water stress has grown to include food security, economic development and reduced exposure to disaster events. This collaboration between government, industry and civil society is now very much about strengthening water security *and* climate resilience, as the two are deeply intertwined.

Water stress in the uMhlathuze catchment

The uMhlathuze region has been a priority stressed catchment for many years, due to the high demand for water and limited reliable yield from the catchment. In recognition of these significant constraints, uMhlathuze was one of three catchments in South Africa prioritised by the Department of Water and Sanitation (DWS) for the lengthy compulsory licensing process. This was done in the hopes that water uses could be accurately documented and licensed to curtail the over abstraction of the resource.

Over the past few years, the available volume of water has decreased significantly due to ongoing drought conditions, with parts of the catchment still declared disaster areas. For the many industry and agricultural water users in the lower part of the catchment, the probability of closing operations due to water scarcity has become the highest business risk.

Several industries have implemented water reduction measures within their fence lines, but despite significant success, these corporate efforts are insufficient to improve overall water security in the catchment. For this reason, UWASP is working hard with its partners to improve this situation, through a number of projects.

Developing the basis of an early warning system

UWASP is in the process of developing and implementing two innovative real-time river flow monitoring tools, that could form part of a locally developed early warning system for the uMhlathuze River catchment and Richards Bay area of South Africa. These tools are being developed by the not-for-profit water resource management specialists AWARD, together with the National Business Initiative (NBI), GIZ's Natural Resources Stewardship Programme (NatuReS) and WWF-South Africa, with support from UWASP corporate partners Mondi and South32.

The tools, known as FlowTracker and Inwards, were initially developed by AWARD and used in the Olifants River catchments as water resource management tools, and are now being adapted for use in the uMhlathuze region. Their ability to provide near real-time data on rainfall and river flows is also serving equally well as the foundation of an early warning system, that has widespread visibility to impending flood and drought disasters.

FlowTracker is a cell phone app with public access, and the Inwards decision-support system is a more in-depth computer desktop application that supports mandated water resource managers and authorities to interrogate the data in detail. These tools will assist authorities and water users to make informed strategic decisions, but also support the involvement of all stakeholders in Integrated Water Resource Management in the catchment.

The beauty of the approach being adopted in uMhlathuze is not only the low cost and low data needs of a South African developed system, but also the ability to meet the needs of both mobile phone and desktop users. Thus, whether you are a farmer, business or government official, you can have visibility on key water and weather indicators in the palm of your hand, or dive into the numbers and trends on a computer.

In addition to rolling out FlowTracker and Inwards, we are also working closely with the provincial DWS to improve the water gauging and monitoring stations in the uMhlathuze River catchment. Used correctly, data is powerful and can help us understand the strengths and vulnerabilities in a water stressed system. This will increase data reliability and visibility for all users, based on improvements made to *existing* monitoring networks, rather than creating new ones.

If we are to adapt effectively to climate change, we will need to build on our existing institutions, assets and expertise to tackle the difficult issues by working together. The implementation of FlowTracker and Inwards in uMhlathuze is a good example of this type of collaboration, with the private, public and government sectors working together to ensure "some water, for all, for ever".

Using drones to improve municipal finances and resource planning

Why is it that cities experience an ongoing and increasing discrepancy between their calculated water demand and actual water consumption? Could it be non-revenue water through leakages? Illegal water connections? A mistake in the calculations?

In 2019, the City of uMhlathuze experienced exactly this problem. A gap analysis commissioned by GIZ NatuReS and the City confirmed the urgent need for the municipality to improve the water supply to

traditionally managed areas, while at the same time decreasing the unbilled consumption in these regions. To meet this objective, two pilot studies were undertaken using drone technology to measure population increases, calculate average per capita water consumption, understand the extent of water losses and improve water supply planning.

The villages of Gobandluvo and Vulindlela were chosen as pilot areas to determine the population and subsequent water demand using a Remote Pilot Aircraft System (RPAS), known commonly as drone technology.

Aerial photos of Gobandluvo were compiled from autonomous drone flight information indicating the most recent developments. The aerial photos were then georeferenced over the existing zonal areas and two project focus areas. This information was then used to calculate the theoretical water demand, and to compare this with the area's actual water demand.

The findings of the investigation were surprising. They highlighted that the population had increased dramatically from the 2011 Census. The result was that the area of Gobandlovu, which was marked as a "High Water Loss Area" and thus a high priority for water conservation, was actually close to its expected per capita water consumption. In reality, the region's population had tripled and with it their water demand.

The work undertaken also identified significant illegal and unbilled connections. With the information obtained from the drone, the municipality can now target areas with the right interventions to reduce illegal connections and upgrade infrastructure to meet community needs.

Through the strong success of the pilot project, NatuReS through UWASP was also able to donate a drone to the municipality and is presently supporting three municipal officials in obtaining their drone license. This certification will help the municipality to carry out similar exercises in other areas, but will also allow them to:

- Detect water leaks
- Undertake point leak detection at high lying reservoirs
- Implement population counts
- Monitor invasive plant species
- Monitor river flows, including identifying spillages and illegal structures
- Track progress in construction activities

This ongoing work will improve service delivery and water demand management across the City of uMhlathuze. It also provides a further example of UWASP's approach of embracing new technologies and supporting the capacity of local stakeholders to improve planning and reduce risk.

Strengthening localised water governance

This UWASP project focuses on the establishment of a local water management institution to support and drive, in a coordinated manner, the various initiatives that support improved water resource management and stewardship arrangements on the ground. It also aims to connect local actions to broader national water resource management strategies and action plans.

Local water management institutions are critically important for localised water resource management and are a key part of the institutional framework required for water resource governance. These institutions can take various forms and include catchment management forums (CMFs), catchment management committees (CMCs) and water user associations (WUAs).

The initial idea of this project was to strengthen agricultural irrigation governance through the merging of five irrigation systems into one Water User Association. However, there has been a significant array of challenges in the process to establish WUAs and as a result, the progress nationally has been limited, especially with the transformation of Irrigation Boards to WUAs.

UWASP through WWF-South Africa, has been working with Pegasys, a renowned consultancy specialising in water resource governance and management, to assist in the establishment of a local Water Management Institution. Pegasys conducted a scoping study for the establishment of such an institution. After holding stakeholder consultations with the Department of Water and Sanitation and key UWASP stakeholders, it was concluded that a Catchment Management Committee (CMC) be established, aligned to the establishment of the Pongola-uMzimkhulu Catchment Management Agency (CMA), as stipulated by the National Water Act. A business case for the CMC was developed by Pegasys and presented to all key stakeholders.

Unfortunately, the DWS process of establishing fully fledged CMAs has been temporarily put on hold around the country while DWS decides on the appropriate way forward. Once this process has restarted, UWASP will work with Pegasys to formally develop an implementation plan for the Catchment Management Committee, coupled with the development and evolution of the Pongola-uMzimkhulu CMA.

Building the adaptive capacity of the uMhlathuze agricultural sector

The Covid-19 outbreak disrupted many facets of life, including agricultural trade. Lockdowns reduced the spread of the virus but also reduced the movement of people, goods and the provision of services. This impacted labour and productivity, especially within the agriculture sector, deepening income inequality and the need for diverse livelihood strategies of the poor.

In South Africa, the pandemic's impact on the agricultural sector has been significant. In KwaZulu-Natal and the uMhlathuze catchment, commercial and small-scale farming is highly prevalent, and the region was deeply affected by the pandemic's impacts on the economy. Apart from Covid-19, this situation was further exacerbated by the unprecedented looting and political instability experienced in the province in July 2021. All these challenges impacted on the recovery efforts of the local agriculture sector.

To understand the exact effect of the pandemic on the local economy, the City of uMhlathuze partnered with NatuReS and UWASP in 2021 to assess the pandemic's impacts on agriculture and food security in the uMhlathuze catchment, including the main resilience strategies that can support the region's farming community.

This work builds off UWASP's previous support to enhancing the commercial networks of smallholder farmers in the uMhlathuze area, through the Siyazisiza Trust, and demonstrates how the work of the partnership now encompasses water, agriculture and greater resilience to external shocks, in an integrated approach.

"Let's be responsible and save our future together"

Together with the City of uMhlathuze, UWASP launched an information campaign with the overarching slogan "Let's be responsible…" in late 2021.

The campaign, which was broadcast through social media and on GagasiFM in English and isiZulu, built awareness around being a responsible citizen with a focus on environmental protection, including using water sparingly and not littering, but also wearing masks and getting vaccinated.

The campaign has continued into 2022 and has been rolled out in several primary and secondary schools in the area, in tandem with an information sharing campaign targeting up to 500 seasonal farm workers.

Supporting the well-being of seasonal workers and the youth, and building a culture of environmental stewardship, is a further step on the road to achieving greater societal understandings of the urgency in being a responsible citizen, in an ever-changing world.

Scaling for impact in Northern KwaZulu-Natal

The challenges facing South African companies, communities, farmers and ordinary households from climate change and existing weather extremes are stark.

But, as an example of successful collaboration in the face of adversity, UWASP has demonstrated that an effective partnership between business and government is achievable, that our efforts can build greater trust, and that it is possible to tackle key challenges to reduce systemic risk and build local economies.

The opportunity for the partnership is clear: now is the time to strengthen our impact and further embed the systems and capacity that will meet our future water and climate adaptation needs.

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uMhlathuze Water Stewardship Partnership

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