BASEflow

ANNUAL REPORT 2025

groundwater matters

What's Inside

We are BASEflow

BASEflow is a Malawian-led NGO and Social Enterprise founded in 2017 to make groundwater – an often invisible but critical resource – visible and sustainably managed by water users and decision-makers alike.

We work at the intersection of Water, Sanitation and Hygiene and Integrated Water Resources Management. We aim to strengthen government systems and empower communities to safeguard water security for present and future generations.

Our efforts are aligned with national priorities and policies including Malawi's Water Resources Act, National Water Policy, and Vision 2063.

OUR **VISION**

A world where no well runs dry

OUR **MISSION**

To improve groundwater sustainability for rural populations to access safe drinking water through strengthening of government and community systems to effectively monitor, manage, develop, and harness groundwater for improved livelihoods and resilience.

OUR **CORE VALUES**

BOLDNESS

INNOVATION

PRAGMATISM

SUSTAINABILITY

TRANSPARENCY

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Team Leader's Message

The Numbers Are In

For many years, conversations about groundwater in Malawi have been shaped largely by anecdotal evidence. Hydrogeologists, communities, and practitioners have observed boreholes drying earlier than expected, declining yields, and changing seasonal patterns. Yet because groundwater is invisible, these warning signs are easy to miss. Out of sight can easily become out of mind.

But today, the numbers are in, and they tell a clear story.

Malawi's Annual Economic Report (2025) indicates a clear downward trend in water availability across the country. Approximately 77.8% of monitored boreholes recorded lower water levels than the previous year, highlighting growing pressure on Malawi's aquifers. For a country where more than 80% of the rural population relies on groundwater for domestic water supply, this trend should concern all of us.

New research released in 2025 provides further clarity. The first national model of groundwater storage change estimates an average annual loss of approximately 0.59 cubic kilometres of groundwater, equivalent to losing roughly one-third of the volume of Lake Chilwa every year. These findings confirm what many practitioners have long suspected, groundwater decline is not hypothetical.

It is measurable.
It is real.
And it is happening now.

The longer we wait to act, the more this manageable challenge risks becoming an irreversible crisis.

The numbers may be sobering, but they also give us clarity. And with clarity comes the opportunity to act, but we can't act alone.

Encouragingly, others are stepping up to join this effort. Habitat for Humanity Malawi has adopted groundwater monitoring wells within its catchment areas. Self Help Africa has begun integrating flood-resilient handpump designs into its programming. WaterAid Malawi has institutionalised hydrogeological assessments as a core component of its WASH systems strengthening work.

For too long, groundwater management has been treated as a specialised corner of water resources management. It does not fit neatly into familiar sector metrics such as counting the number of boreholes drilled or people served. Yet the sustainability of water supply services ultimately depends on us grappling with the complexities of this emerging groundwater challenge.

Muthi Nhlema
Team Leader

A challenge that has compounded over years through the negligence and inaction of previous generations. Now it's our turn. What will be our legacy?

Our hope is that this momentum set by others continues to grow. Groundwater cannot remain "BASEflow's baby", as is sometimes described when organisations look for reasons not to engage or partner. Nor can we afford to remain trapped in the lingering territorialism of the Big Aid era, when development work was too often defined by institutional silos rather than shared responsibility.

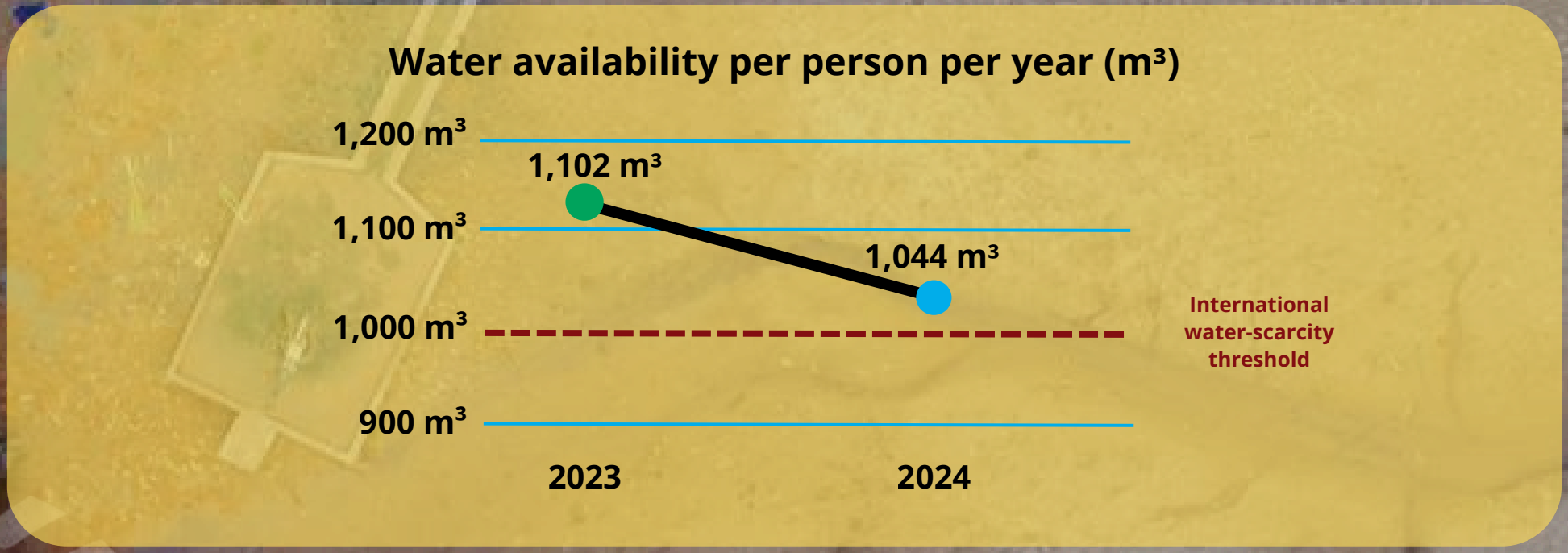
The numbers are clear. The challenge is significant, but so is the opportunity. By acting together now, we can protect the invisible resource that sustains millions of Malawians.

Because the numbers are in, and they are telling us something Malawi can no longer afford to ignore.

Water Scarcity Crisis

Malawi is running dry.

Groundwater is the **lifeline for over 80% of Malawi's population.** The increased frequency of **El Niño** cycles affects Malawi's weather system. Increased periods of **drought and insufficient recharge** have depleted groundwater reservoirs and pushed us towards a groundwater crisis. If left unchallenged, Malawi will become a water-scarce country before 2030.



Malawian Government Ministry of Finance and Economic Affairs - Annual Economic Report for 2025

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The Numbers Told the Story

80% OF MALAWIANS RELY ON GROUNDWATER

78% OF BOREHOLES MONITORED SHOW GROUNDWATER DECLINE

25% OF BOREHOLES FAIL MINIMUM STANDARDS

Global water use is predicted to outstrip supply by up to 40% by 2030. Water availability has become less predictable in many places, in part due to climate change.

According to the World Resources Institute Aqueduct Water Risk Atlas, 25 countries experience extremely high water stress annually, often depleting nearly all of their available water resources.

"The world is not on track to meet Sustainable Development Goal 6 for Clean Water and Sanitation by 2030."

— United Nations SDG Report 2023

2025 Impact at a Glance

14,645	1,168 HA	401	50
Total Beneficiaries	Land Dedicated to Groundwater Recharge	Water-Table Level Datapoints Dollected	Functional Monitoring Wells

2025 OPERATIONAL OUTPUTS	
Borehole forensic checks	43
Borehole drilling supervised	13
Functionality updates to MWAMIS	1,643
Groundwater monitoring wells rehabilitated	10
Smallholder farmers trained in deep bed farming	2,386
Local government staff trained in drilling supervision	20

PROGRAMME AREA | People Reached	
Manduwasa Water Supply System, Machinga	1,925
Chizenga Water Supply System, Chikwawa	2,000
Bank of Ireland/SRWB Board Water System, Chikwawa	3,075
Mpira Trust Water Supply Scheme, Balaka	4,560
Flood-Proof Handpump Rehabs, Balaka, Chikwawa, and Machinga	3,085
TOTAL	**14,645**

2025 TIMELINE

Key activities, partnerships, and milestones achieved by BASEflow.

JAN

Manduwasa 1.5km water supply network brought water to 315 households as construction was funded by Irish Aid through Trocaire under the Irish Aid Civil Society Program

MAR

BASEflow signed an official MoU with Ministry of Water and Sanitation

APR

Attendance at the Skoll Foundation World Forum in Oxford to share BASEflow's climate innovation for insured flood-proof handpumps

MAY

Manja Village borehole flood-proofing with Trocaire through the Irish Aid Civil Society Programme

JUL

SADC-GMI Winter School with lecturers and practitioners from Botswana, Eswatini. Lesotho, Namibia, South Africa, Zambia, and Zimbabwe

AUG

Training on borehole drilling supervision for frontline staff from the Ministry of Water and Sanitation, District Water Officers, and Self Help Africa teams from Dowa and Thyolo Districts

NOV

- BASEflow Flood-Proof Hand Pump Manual released to the public
- 7th SADC Groundwater Conference in Johannesburg on Investing in Groundwater for Climate Action
- National Conference on Rainwater Harvesting in Lilongwe

DEC

EPANET 4-day training on water-network modelling software to simulate hydraulic behaviour in piped distribution systems

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Fellowships & Awards

AFRICAN VISIONARY FELLOWSHIP

African change makers worked on grassroots innovation and community-driven development. The Segal Family Foundation believes organisations who are proximate to the challenges are best placed to devise sustainable solutions relevant to local contexts.

ASHOKA FELLOWSHIP

Social entrepreneurs identified and networked to reimagine solutions for the world's most pressing challenges. For 40 years, Ashoka has nurtured the largest network of social entrepreneurs to champion new patterns of social good.

RAINER ARNHOLD FELLOWSHIP

The Mulago Foundation looks for mostly early stage founders who have a big scalable solution to provide a better life for the poor and a route out of poverty. Fellows are given $100K and an intense year of learning. The best ideas continue to be funded.

WOMEN IN WASH AWARDS

Assistant Hydrogeologist, Gloria Musopole, together with her incredible team of technical assistants, Gloria Maliana and Florence Chirwa, were named the Rising Star Award winners at the African Water and Sanitation Association Conference in Yaounde, Cameroon.

Groundwater Matters

Putting our 2025-2030 Strategy into action

BASEflow undertook an internal realignment across human resources, finance, M&E, and performance management to align with our 2025–2030 Strategy and ensure that groundwater remains the core focus across external programmes and internal systems.

In 2025, we streamlined programme activities to deliver on our mission and the **five priority intervention areas** outlined below:

1 INFRASTRUCTURE
Building rural groundwater-dependent infrastructure for community resilience

2 DATA GOVERNANCE
Improving data governance for groundwater management and development

3 COMMUNITY STEWARDSHIP
Empowering communities for groundwater stewardship

4 STAKEHOLDER CAPACITY
Enhancing stakeholder capacity for groundwater governance

5 KNOWLEDGE EXCHANGE
Managing an up-to-date platform for groundwater knowledge

PRIORITY 1 · INFRASTRUCTURE

Building Resilience

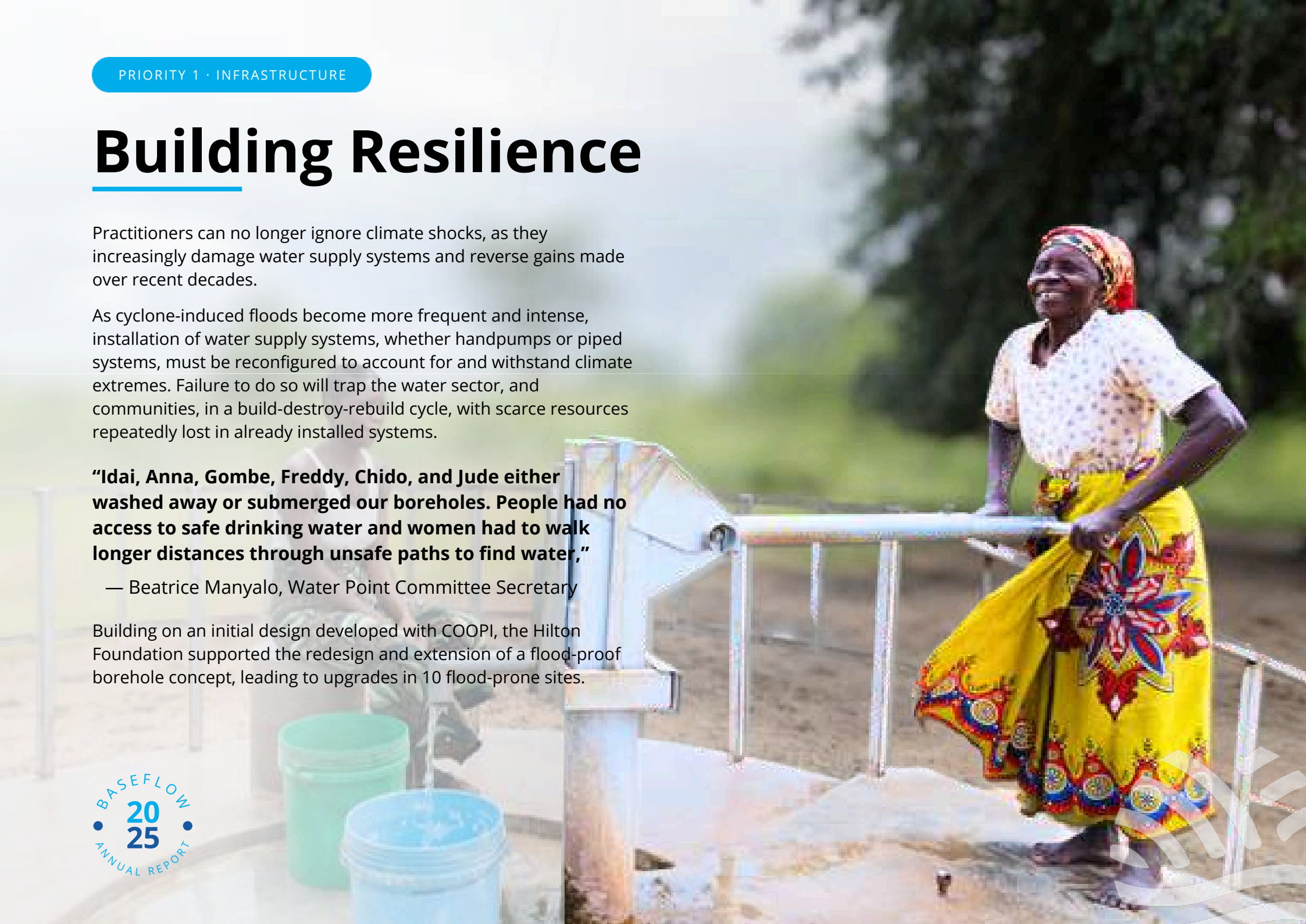
Practitioners can no longer ignore climate shocks, as they increasingly damage water supply systems and reverse gains made over recent decades.

As cyclone-induced floods become more frequent and intense, installation of water supply systems, whether handpumps or piped systems, must be reconfigured to account for and withstand climate extremes. Failure to do so will trap the water sector, and communities, in a build-destroy-rebuild cycle, with scarce resources repeatedly lost in already installed systems.

“Idai, Anna, Gombe, Freddy, Chido, and Jude either washed away or submerged our boreholes. People had no access to safe drinking water and women had to walk longer distances through unsafe paths to find water,”

— Beatrice Manyalo, Water Point Committee Secretary

Building on an initial design developed with COOPI, the Hilton Foundation supported the redesign and extension of a flood-proof borehole concept, leading to upgrades in 10 flood-prone sites.



Borehole Insurance

In recent years, Malawi has faced repeated cyclones that damage infrastructure, disrupt communities, and expose a growing vulnerability. The critical question is, *"What happens when water systems are repeatedly destroyed?"*

In response, BASEflow engaged several insurance companies to explore financial protection mechanisms for at-risk boreholes against future damage. Most were reluctant to engage or become first adopters, but one was willing to develop a viable solution.

Khumbo Banda, a Business Development Officer at NICO General, told us that while NICO had insured drilling operations, there were no prior models to guide them on how to underwrite an installed rural water point — this was both unprecedented and high risk.

However, after reviewing the flood-proof design and BASEflow's proposed endowment fund to generate annual interest for premiums, Khumbo saw an opportunity to innovate in a way that aligned with NICO's corporate social investment agenda and risk management approach.

With support from the Shockwave and Crap Foundations, NICO engaged the Mulanje District Council and beneficiary communities across 10 sites to build shared understanding and collaborative governance around a pilot for the borehole insurance model.

The pilot, to insure 10 boreholes, focused on building community trust and refining operational details, whilst aligning corporate social investment with practical innovation and community priorities. If successful, this offers a pathway to scale across flood-prone areas in rural Malawi.

"I don't think even the Water Boards insure their infrastructure. It will ease pressure on Council budgets if we spend less emergency funds on borehole repairs, and focus on building new systems in places that do not have any."

— Edwin Mchilikizo, District Water Development Officer

PRIORITY 1 · INFRASTRUCTURE

“The first time I opened the tap in my house, the water flowed right here. It was such a joyful moment.”

— Anne Osman Sailos, mother and businesswoman

The Day Water Came Home

For eight years, Anne walked 6km every day to stand in a long queue at the Namikalango borehole. As a trader who sells dried fish and pigeon peas, these were long days.

“Sometimes, I would leave early in the morning and only return in the afternoon with my water. If I travelled and returned late, then there was no water. We had to ask neighbours for help.”

Then the Mpheza Water System was introduced. Three community water kiosks were installed through a partnership between BASEflow, the Southern Region Water Board, and the Irish charity, Trocaire. The kiosks were a great improvement, but Anne wanted more, she wanted a tap at her house.

Anne worked with nine neighbours to buy pipes and dig trenches. She invested 150,000 MWK (approximately $100) for the materials and the connection fee. Anne now has running water at home and pays an affordable monthly water bill.

“Life has changed tremendously. Visitors come here and say they want water too. I tell them, it is possible. Every drop from this tap means freedom. I pray that one day, everyone in Mpheza will have the same.”

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Blind Spots Became Data Points

Monitoring wells form the frontline of groundwater management, enabling tracking, early warning, and informed decision-making. However, a 2022 assessment found that only 16 of Malawi's 100 monitoring wells were functional, leaving the country effectively blind to the condition of its groundwater resource.

Groundwater Monitoring

With growing anecdotal and empirical evidence of groundwater decline, establishing and maintaining a functional monitoring network is essential. This requires locally appropriate technologies and sustained investment to ensure continuous, reliable data collection.

In 2025, BASEflow continued efforts to rehabilitate the national monitoring network while expanding collaboration with stakeholders to improve coverage. The objective was to transform blind spots into reliable data points, to ensure that groundwater conditions across the country are consistently tracked and understood.

With support from the SADC Groundwater Management Institute, Shockwave Foundation, and Crap Foundation, BASEflow rehabilitated monitoring wells and installed three telemetry-enabled wells to enable real-time transmission of groundwater level data and strengthen national capacity for proactive groundwater management.

BASEflow partnered with Habitat for Humanity Malawi to provide technical support to integrate water resources management into WASH programmes. This included procurement, installation, testing, and the launch of a telemetry-enabled monitoring well in T.A. Masumbankunda, Lilongwe District. It was then handed over to the National Water Resources Authority.

PRIORITY 2 · DATA GOVERNANCE

Our First Open Data Release

BASEflow partnered with ETH Zurich on an Open WASH Data Project to challenge data silos and promote collaboration in the WASH sector.

Through the work of a Data Steward based at BASEflow, the **Borehole Forensics 4 – Pumping Test 2018-2024** dataset was released. This is an open-access resource for transparent, data-driven decision making. It provided comprehensive insights into groundwater extraction and borehole performance. The dataset included 203 observations and 44 variables that covered critical aspects of borehole functionality and water quality:

- **Test Conditions:** dates, administrative regions, and GPS coordinates
- **Hydrogeological Metrics:** static water levels, pumping rates, and flow measurement methods
- **Water Quality Indicators:** pH, turbidity, electrical conductivity, and total dissolved solids
- **Operational Observations:** equipment used, permissions granted, and borehole performance notes

The dataset can serve hydrogeological analysis, environmental studies, infrastructure planning, and regulatory compliance.
It is accessible through https://openwashdata.github.io/boreholeforensicspumpingtest/

WASH professionals and researchers can explore and contribute to the dataset by visiting openwashdata.org

PRIORITY 3 · COMMUNITY STEWARDSHIP

Citizen Scientists

Citizen science refers to the participation of non-specialists in scientific processes. In Malawi, community involvement in water management was already common practice. Within groundwater monitoring, citizen scientists supported routine data collection and site stewardship. They provided a locally embedded approach to sustain monitoring systems that were otherwise under-resourced at national level.

A 2022 national assessment found that, while Malawi had over 100 groundwater monitoring sites, only 20 had active gauge readers, or citizen scientists. These individuals, drawn from local communities, played a critical role in collecting groundwater level data and safeguarding monitoring infrastructure, yet their network was limited.

Through BASEflow's work, the number of monitoring sites with citizen scientists increased to 30. They were supported with equipment such as manual dippers, reflective vests, and mobile phones for digital data collection. In partnership with the University of Strathclyde, 13 sites piloted mobile-based monitoring to improve data transmission, reduce reliance on paper, and enable real-time support and troubleshooting.

Citizen science brings local information to policymakers and connects government to community action.

PRIORITY 3 · COMMUNITY STEWARDSHIP

Local Volunteers

Tumani Kaliyati, a 35-year-old teacher at Chidoole Primary School, once overlooked the groundwater monitoring well on campus. This changed after a sensitisation meeting with the Ministry of Water and Sanitation and BASEflow, where he learned its importance. He volunteered as a gauge reader under a citizen science initiative and received training in measurement, maintenance, and digital data collection through the mWater platform.

"I saw the well for years, but I didn't understand why it was there. Why should I care?"

— Tumani Kaliyati, community volunteer

As his confidence grew, Tumani trained a colleague to ensure continuity, reflecting a growing sense of ownership at the local level. His work forms part of a broader effort where citizen scientists act as the frontline of groundwater management, collecting data, and safeguarding monitoring wells in resource-constrained environments. Recognising their importance, the Mwanza District Water Office committed to provide regular support to volunteers like Tumani, to strengthen both data quality and collaboration between communities and government.

For Tumani, the work was deeply personal, rooted in a responsibility to future generations. Through consistent data collection and stewardship, citizen scientists like him made groundwater visible, contributed to evidence-based decision making, and shaped a more sustainable water future for Malawi.

PRIORITY 4 · STAKEHOLDER CAPACITY

Private Sector Partnerships

While Malawi has established guidelines for groundwater infrastructure, these are often poorly understood or not followed by local government extension workers and drillers. This led to weak supervision and non-adherence to standards, compromising construction quality and increasing the risk of nonfunctionality. In 2025, BASEflow received support from Self Help Africa to train 20 extension workers, but a gap remains in engaging private-sector drillers, who play a critical and often overlooked role.

Drillers Association of Malawi

BASEflow, in partnership with the Water and Environmental Sanitation Network, convened an interface meeting with the Borehole Drillers Association of Malawi and the Ministry of Water and Sanitation to discuss key technical challenges affecting drilling practices and construction quality. The aim was to strengthen collaboration toward improved service delivery and responsible groundwater development.

Beyond technical discussions on improving drilling standards and practices, conversations revealed the human side of the work. Drillers spoke about enduring dust, heat, long hours, and difficult terrain. They described the work as deeply rewarding, with the greatest moment being when they strike water and celebrate alongside communities.

PRIORITY 4 · STAKEHOLDER CAPACITY

Changing the Narrative

Drillers shared concerns about inconsistent drilling quality and high borehole failure rates. They felt they were often portrayed as villains when things did not work out. Drillers took the opportunity to sit at the same table with the legislators to discuss conditions in the field honestly.

"There are no standard operating procedures for drillers — everything is learned informally on the job. It's easy to blame drillers, but the problem is bigger than any one actor. Some licensed companies do not even own drilling machines. There are no trained geophysical surveyors for proper site selection. Contracts are weak, and drillers are paid only for wet holes. The whole system needs attention."

Grand Chikweza, driller, business owner and President of the newly established Drillers Association of Malawi (DAM)

Everyone listed challenges and confirmed their willingness to improve the situation. The drilling association members were ready to collaborate and demonstrate accountability.

"As an association, we can weed out bad practices and support those who want to do things the right way. We are already uniting drillers from the north, center, and south. We are having hard conversations and learning from each other."

The drilling executives agreed to communicate openly and coordinate with regulatory bodies; BASEflow committed to continued support for training and advocacy; and the legislators recognised the importance of sitting together to rewrite the narrative about drilling in Malawi.

PRIORITY 5 · KNOWLEDGE EXCHANGE

Knowledge Drives Impact

From technical manuals to digital resources, BASEflow's knowledge reached practitioners across Malawi, Africa, and beyond.

Flood-Proof Hand Pump Manual

72 downloads **21** countries

This was one of BASEflow's most downloaded technical resources in 2025, helping practitioners access flood-resilient infrastructure knowledge across multiple regions.

The New BASEflow Website

In 2025, BASEflow relaunched its website to improve access for partners, practitioners, and researchers. Annual reports, field stories, technical manuals, and key partner resources are now easier to access in one user-friendly digital hub.

Digital Reach

4,260 users **5,459** sessions

Top audiences: China (1,598), United States (877), Malawi (677).

Diagnosis and Physical Audits of Boreholes and Pumps

The conversation around rural water supply is shifting, and the Rural Water Supply Network Early Webinar Series made that clear. The discussion reflected a growing global urgency to confront these challenges more systemically. Bringing together practitioners from across the globe, our webinar focused on our borehole forensics methodology. It highlighted that borehole failure was rarely the fault of a single actor or factor, but the result of systemic weaknesses across the entire value chain.

We had 489 people registered, with 194 participants who joined live from 20 countries across four continents. Another 95 accessed the recording afterwards.

A key outcome was the strong emphasis on diagnosis over assumption. Rather than defaulting to quick fixes, we demonstrated the importance of structured physical audits to uncover the root causes of failure, whether linked to siting, design, construction, or maintenance. The forensic approach is essential to improve long-term performance.

The webinar underscored the need for independent supervision and stronger accountability mechanisms. This is important during drilling and installation, to ensure quality and value for money. We called for better use of data, not just for reporting, but also for learning, adaptation, and decision making.

Ultimately, we emphasised that sustainable rural water services can only be achieved when governments, drillers, NGOs, and communities move beyond blame and use verifiable data to work together openly and share responsibility.

If you would like to watch the full webinar, you can access it here: https://youtu.be/tVUaRDMn_Ek?si=pm-kVKihelNR5o9C.

Social Enterprises

BASEflow Services, BASEflow Construction, and BASEflow Products are three social enterprises designed to support our mission and ensure long-term financial sustainability for our non-profit work. Every penny we earned helped us grow and innovate!

BASEflow Services
Consulting support and assessments helped governments, communities, and NGOs make smart, evidence-based decisions

BASEflow Construction
We built and rehabilitated water infrastructure to last, from boreholes to full piped solar reticulation networks.

BASEflow Products
Off-the-shelf water tools, solar pumps, and quality testing kits improved service delivery and quality assurance.

Project	MWK	USD
Solar-Powered Water Reticulation System Rehabilitation and Expansion - Chizenga	54,000,000	$31,450
Primary School Sanitation Facility Rehabilitation and Upgrade - Kapeni	103,309,000	$60,000
Waste Treatment Civil Works Construction-Mzuzu	18,768,990	$10,833
Borehole Rehabilitation-Blantyre, Chiradzulu, Lilongwe & Mwanza	28,882,033	$16,670
Elevated Borehole Construction	16,500,000	$9,525
Total project costs	**221,460,023**	**$128,478**

Funding groundwater innovation

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Financial Overview

NGO	2025	2024	2023
Income MWK	1,063,526,512	1,101,964,397	848,249,909
Expenditure MWK	1,192,120,876	1,064,762,069	844,365,916
Income USD	619,529	636,935	757,914
Expenditure USD	694,438	620,249	754,444

SOCIAL ENTERPRISE	2025	2024	2023
Income MWK	292,048,956	206,987,133	94,508,892
Expenditure MWK	276,012,276	181,138,888	109,304,329
Income USD	170,125	120,575	84,444
Expenditure USD	160,784	105,518	97,664

Our Partners

BASEflow's work is made possible through the generous support, collaboration, and expertise of our partners across government, civil society, academia, and the private sector. See our partners below.

"Together, we are building a future where no well runs dry."

Get in Touch

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