Digging deep to survive drought

Sean Furey discusses how East Africa could become more resilient in the face of drought

Sean Furey

Drought is a slow death that lurks beneath the headlines, occasionally surfacing when its worst effects bite hard. In California, the long-running drought appears to be ending, but its impacts will be long-lasting, not least the breakdown of trust between farmers, regulators and urban residents and water users.

As one drought ends, another – in East Africa – that has been getting worse over the last year is getting the world's attention. Livestock herds in Ethiopia are dying, while households in rural Kenya are paying more than US$25 per cubic metre of water; that's more expensive than tap water in Tokyo, New York or London, and the water quality is generally unsafe.

Images of drought-stricken Ethiopia recall the negative image that many people around the world have of Africa as a whole. But this common perception does Africans (and Ethiopians and Kenyans, in particular) a great disservice. Ethiopia and Kenya have seen dramatic economic growth in recent years, and the so-called 'Silicon Savannah' of Kenya is a hotbed of mobile phone-based innovation. University researchers from both countries are also leading the way in taking the latest in this technological progress and global climate and groundwater science to find better ways to help their countries to adapt to the current drought and to increase resilience in the future.

At a UNICEF meeting in April, Professor Daniel Olago of the University of Nairobi, presented the detailed hydrogeological maps that he and his team have been developing in Kwale, in southwest Kenya. This work uncovered fault lines and the structure of the water-bearing aquifers in far greater detail than was previously available. "This research is not just for academic journals, it provides information that can help drillers find the areas where they are more likely to find water, and those where they have little chance," said Olago.

However, while there are still untapped aquifers in East Africa waiting to be drilled, such research doesn't do away with the need for proper borehole siting and water-quality testing. "Even in rural areas where man-made pollution is not so likely, there can be natural contaminants like fluoride and arsenic, that are at levels high enough to have health impacts," he said.

New boreholes can help those affected when the rains fail, but such resources are not infinite. So it is vital that when the rain does come, which in Kenya is in March to April (long rains) and in September to December (short rains), that as much water as possible is captured and the aquifers are recharged.

Ethiopian researchers at the Water & Land Resource Centre (WLRC) and Addis Ababa University are working on this water-security challenge. Dr Meron Teferi Taye, director of the REACH Ethiopia programme, speaking to students at Nairobi University, said: "One of the key questions we are asking is: How do sustainable land-management programmes relate to interventions promoting groundwater use, and how can the benefits of groundwater development for the rural poor be secured and maximised? We think that farmers are part of the answer and that by protecting their soil, through the right combination of planting and landscaping, they can improve their yields and allow more rain to be captured and held in the soil, and the underlying aquifers."

> **"So it is vital that when the rain does come, as much water as possible is captured and the aquifers are recharged"**

The extreme variability of the tropical climate is an unavoidable reality, and climate change is adding to this. To get through the tough times, it is important to save water in the ground during good times. The drought is particularly tough because it has been persistent and the weather has been warmer than normal across most of the Horn of Africa. However, Olago and colleagues from Oxford University may be close to a breakthrough in low-cost groundwater-level monitoring that offers the opportunity for real-time drought monitoring so that interventions can be targeted.

Africa has been a global pioneer in seasonal rainfall forecasting, and this has allowed some response to tackle the problem before it becomes a crisis, but still not enough has been done. The scale of the drought challenge, in duration and extent, means that no single organisation can prevent disaster, as Eugene Wamalwa, Kenyan cabinet secretary for water and irrigation, told the UNICEF meeting: "We need all hands on deck – government can't do everything alone."

The rain is falling again, in Nairobi at least, but it takes more than a few showers to end a drought. We need science to help us come up with practical, smart solutions to save lives now and make livelihoods more resilient for the future.

More information

Reach: reachwater.org.uk
UPGro: upgro.org/consortium/gro-for-good

Sean Furey is a water and sanitation specialist at Skat Consulting, based in St Gallen, Switzerland. He is co-lead of the sustainable groundwater development theme of the Rural Water Supply Network (RWSN) and leads the knowledge broker team for UPGro (Unlocking the Potential of Groundwater for the Poor).