

Mobile technology to fix hand pumps in Africa

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Hand pumps in Kenyan villages will be among the first to benefit from the new transmitters. Credit: Rob Hope.

(Phys.org) -- Thousands of families affected by the ongoing drought in East Africa are set to benefit from improved water supplies thanks to innovative mobile technology designed by Oxford University.

Hand pumps provide the main source of [drinking water](#) for [rural communities](#) in Africa, but around one-third of them do not work at any one time. It can take up to a month or more before they are fixed, leaving communities without easy access to clean [water](#). But in August Oxford University researchers will start a pilot project in Kenya to install new, low-cost data transmitters that work in a similar way to mobile phones.

These Smart Hand Pumps will automatically send a [text message](#) to the district and national [water managers](#), so they know when and where there is a problem, as well as when the problem has been fixed.

Researcher Patrick Thomson said: "The technology is simple and robust. The transmitter is no bigger than a [mobile phone](#) and fits inside the hand pump. It automatically registers the movement of the handle of the pump and from this calculates the amount of water extracted from the pump. An automatic text about the [water usage](#) at each pump is sent at regular intervals to water supply managers, who then immediately know when and where a pump needs fixing. This should enable problems to be addressed more quickly and transparently than they are at the moment, so people don't have to go without safe water – with all the resulting health problems that can cause."

Lead researcher Dr. Rob Hope, Senior Research Fellow at Oxford's School for Geography and the Environment, said: "Reliable water supplies lead to healthier people and more productive livelihoods. We hope that by applying mobile communications technologies within the rural water sector, we can improve water security and reduce poverty for the 276 million people in rural Africa who currently don't have safe and reliable water supplies."

The researchers will start to install the technology in 70 village hand pumps across the Kyuso District of Kenya, in a pilot trial funded by the UK Department of International Development. Kyuso commonly experiences droughts and will be the first place in the world to use the new Smart Hand Pumps, a mobile technology that should improve the functionality of its hand pumps.

Lack of reliable access to clean water is an enduring problem in rural Africa. Yet [mobile technology](#) in Africa is booming: the number of people within range of a mobile signal has already overtaken the number

with an improved water supply and, this year, the number of people with a mobile subscription will pass the same benchmark.

The Secretary of State for International Development, Rt Hon Andrew Mitchell MP, whose department is funding the pilot project in Kenya, said: "This is a fantastic example of British innovation helping some of the poorest people in the world. Water does not just save lives in the short term – it is a cornerstone for delivering economic growth and helping countries to work their way out of poverty. That is why the UK will help more than 60 million people get access to clean drinking water, hygiene and proper sanitation over the lifetime of this parliament."

A research paper about the technology used in the [pilot project](#) is now online in the *Journal of Hydroinformatics*.

The research team will gather data on the advantages and disadvantages of the Smart Hand Pumps so they can refine the technology as and when needed. Following the trial in Kenya, they plan to roll out a national trial in Zambia, which will be funded by the Economic and Social Research Council.

Provided by Oxford University

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