For decades, there has been a strong focus on supplying improved water infrastructure to rural communities in Sub-Saharan Africa. Whilst large gains have been made, estimates of non-functional water points vary from 15-50% at any one time between different studies. The focus now is on understanding the technological and social causes of this ‘hidden crisis’, and how they interrelate. In this paper, we present the findings of the second phase of a large, interdisciplinary study on the functionality of community boreholes in rural Ethiopia, Uganda, and Malawi. The research employs the latest in physical and social science thinking on this issue to analyse above and below ground dynamics, revealing the ways in which different dimensions of the functionality crisis influence each other.

Informed by the findings of the first phase of the study, a broad survey of 600 sites across the three project countries, the fieldwork consisted of an in-depth survey of 150 boreholes and their related community management arrangements. Two days were spent in each community, where a range of physical and social science methods where employed to understand the causes of non-functional community boreholes. Physical science methods included: aquifer testing; deconstruction and investigation of handpumps; CCTV surveys of borehole construction; characterisation of water chemistry and corrosivity; and assessment of groundwater age and residence times. Social science methods included focus groups; interviews; community mapping; and village transect walks. We employed Qualitative Comparative Analysis to analyse the data. This method blends quantitative and qualitative metrics, generating nuanced contextual knowledge to detect combinations of causal conditions leading to non-functional boreholes.

The multi-country research design and robust interdisciplinary methodology moves this study beyond existing research in this area. Our findings point to key determinants of non-functional boreholes and how above-below ground dynamics play out, sometimes in unexpected ways. We also reflect on the necessity and challenges of explanations generated using this interdisciplinary framing. The research represents an important step forward in realising Target 6.1 of the Sustainable Development Goals, which aims, “by 2030, [to] achieve universal and equitable access to safe and affordable drinking water for all.”