



STUDY NAME

**Groundwater recharge in Africa:  
identifying critical thresholds**

RESEARCH ORGANISATIONS

British Geological Survey (BGS), University College London (UCL), Oxford University (OU), Addis Ababa University (AAU), University of Maiduguri (UNIMAID), University of Ibadan (UI), University of Witwatersrand (UW).

RESEARCH TEAM

BGS: Alan MacDonald, Helen Bonsor  
UCL: Richard Taylor  
OU: Mike Edmunds  
UW: Tamiru Abiye  
UNIMAID: Ibrahim Goni  
AAU: Seifu Kebede  
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RESEARCH AIM / HYPOTHESIS

*The aim of this project is to bring together international and African expertise on groundwater recharge to collate and examine existing data and evidence to provide a benchmark of current understanding of African recharge, search for evidence of critical recharge thresholds and explore the consequences for rural water supply based on future trends. This knowledge will then be used to map out a detailed programme of targeted research using the best practice to measure recharge processes in a wider study of sustainable groundwater management in priority catchments.*

STUDY DESCRIPTION

The development of groundwater for safe drinking water, irrigation and other uses offers huge potential for improving the lives of many African people. Recent research showed that groundwater was present in most parts of Africa and represented a resource greater than the water available in lakes and rivers. However, a key uncertainty is how sustainable groundwater abstraction will be: is it being replenished and if so by how much and will this change in the future?

This research project will bring together a team of African, European and US scientists to examine all the available evidence for groundwater recharge across Africa. The team will use these data to search for the existence of critical recharge thresholds: conditions beyond which recharge may not occur or become unreliable. They will use the dataset to develop a map of observed groundwater recharge volumes for Africa and look for systematic changes across the continent.



The team will also use the opportunity to examine the different methods for measuring groundwater recharge and identify the most appropriate for African conditions.

Together with social scientists they will use the results of the research to highlight areas and future scenarios where groundwater recharge may become a major constraint on sustainable groundwater abstraction, and where wells or boreholes may run dry, impacting particularly on the rural poor. The maps of groundwater recharge, and the quantification of critical thresholds can have many different uses: they should help quantify the risks of groundwater development and manage trade-offs in abstraction for the benefit of the poor; for water engineers working in Africa, they should allow a first pass assessment of groundwater recharge to screen whether recharge may be a major constraint on a project, and also provide the tools for measuring recharge more accurately; for the academic community these new datasets can be used to validate global or continental scale land surface hydrological models. Once the research is completed a workshop and webinar convened by WaterAid will help explore the implications of the research results for planning and implementing new water projects in Africa.

The results of this research will be used as a springboard to design a large field programme of interdisciplinary research to examine the processes which lead to these critical recharge thresholds to allow much more reliable forecasts of where groundwater development may become unsustainable in the future and to explore how groundwater can be best managed in these critical areas.

WHERE?



Ethiopia  
Nigeria  
South Africa

WHERE TO FIND OUT MORE:

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