



STUDY NAME

**Adaptive management of groundwater resources for small-scale irrigation in sub-Saharan Africa (AMGRAF)**

RESEARCH ORGANISATIONS

University of Newcastle (UNEW): School of Agriculture, Food & Rural Development (AFRD) and School of Civil Engineering & Geosciences (CEGS), Geological Survey of Ethiopia (GSE), International Water Management Institute (IWMI)

Partner institutions have been identified in Ghana and South Africa.

RESEARCH TEAM

UNEW: **John Gowing** (PI), Geoff Parkin, Elizabeth Oughton, Jaime Amezaga  
GSE: Demis Alamirew Ayenew  
IWMI: Simon Langan, Karen Villhoth

RESEARCH AIM / HYPOTHESIS

*The study will tackle the following questions:*

- 1. How and at what rate is groundwater being recharged?*
- 2. Can a tool be developed to help decision makers manage the resource?*
- 3. What are the implications of changes in land use?*
- 4. What are the implications of climate change?*
- 5. How can policy and practice assure livelihood benefits for poor people?*
- 6. What governance approaches are most likely to deliver equitable and sustainable use of groundwater?*

STUDY DESCRIPTION

The volume of groundwater in Africa is more than 100 times the annual renewable freshwater resource and 20 times the amount of freshwater stored in lakes, but its productive use in sub-Saharan Africa (SSA) remains low. Global abstraction of groundwater increased tenfold between 1950 and 2000 and contributed significantly to growth in irrigation particularly in Asia. The global area equipped for irrigation has been estimated as 301 million hectares of which 38% depends on groundwater, but for sub-Saharan Africa only 5.7% of the irrigated area is supported by groundwater.

Community level monitoring of groundwater (levels, spring flows, abstractions) is necessary and feasible for assessment of available resources and for adaptive management under stressed conditions.

Tools will be developed for estimating recharge and water balances at



**Unlocking the  
Potential of  
Groundwater  
for the Poor**

**CATALYST PROJECT**

A social and natural science approach to enabling sustainable use of groundwater for the benefit of the poor

different scales. Research will focus on how local monitoring can be incentivised to provide direct benefit to local communities through improved local drought resilience, as well as providing information for management at the resource unit scale. In addition, the social and governance constraints on effective resource management under relevant development scenarios will be assessed.

The research has begun with a pilot study in Ethiopia that is looking technical, social and governance aspects of groundwater resource assessment and management from the regional to the local scale in the Lake Tana basin.

In parallel, additional exploratory research will be done in Ethiopia, Ghana and South Africa. In-country workshops will aim to increase understanding current state of knowledge around groundwater resources. Critical knowledge gaps likely to influence design of follow-up research will be identified and in-country collaborators will carry out short term studies.

At the end of the study collaborating scientists representing partners from Sub Saharan Africa together with UNEW and IWMI will meet for 3-day workshop in Addis Ababa to review lessons learned and agree design of the follow-on research.

WHERE?



Ethiopia, Ghana,  
South Africa

WHERE TO FIND OUT  
MORE:

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