

Rethinking water storage for climate change adaptation in sub-Saharan Africa

International Water Management Institute IWMI

Country/Region:	Volta Basin, Ghana Blue Nile Basin, Ethiopia
German participation:	Centre for Development Research (ZEF) Potsdam Institute for Climate Impact Research (PIK)
Leading scientists:	Dr. Matthew Mc Cartney
Duration:	April 2008 – April 2011

Initial situation

Variability in rainfall and temperature mean that in many places access to fresh water is unpredictable. For many smallholder farmers storing water when it is abundant and conserving it for times of shortage can be the difference between plenty and famine.

As the world's climate changes, increased variability in precipitation and higher temperatures will pose great challenges for agriculture's use of fresh water. Water storage is a key approach to adaptation. However, the value of different types of agricultural water storage may alter and needs to be re-evaluated in light of climate change. Great care must be taken to ensure that future investments in water storage do not undermine poor people's livelihoods, but rather contribute to a safety net for those least capable of coping with climate change.

Approach of the project

For agriculture, there is a continuum of surface and sub-surface water storage options ranging from natural wetlands and water stored *in-situ* in the soil through to rainwater harvesting ponds and to small and large reservoirs.

Each type of storage has its own niche in terms of technical feasibility, socio-economic sustainability, impact on health and environment and institutional requirements. Each needs to be considered carefully within the context of its geographic, cultural and political location. With so much uncertainty in relation to climate change, it is essential to focus on ensuring flexibility in storage systems, possibly combining a variety of types to take advantage of their unique characteristics.



In this project, through multi-disciplinary research conducted at different scales in the Nile and Volta Basins, we are developing methods for evaluating the effectiveness and suitability of all water storage types under existing conditions and a number of future climate scenarios.

Major results achieved

To date, project activities have included:

- the development of a framework for analysis. This provides a basis for assessing different water storage types within a continuum of options.
- the development of a database of hydro-meteorological data as well as different storage types in both the Nile and Volta basins.
- a review of existing and planned storage in both the Nile and Volta basins.
- initial development of models to simulate climate change scenarios and the impacts on water resources in both basins.

Expected impact

The major project output will be guidelines that will assist decision-makers determine storage needs and decide between different storage options. The ultimate beneficiaries will be farming communities in sub-Saharan Africa who through improved storage and

hence increased agricultural productivity and income and decreased risks will be better able to cope with climate variability and change.



Collaborating institutions: Arba Minch University (AMU), Ethiopia; Ethiopian Economic Association (EEA); Water Research Institute (WRI), Ghana; Institute of Statistical, Social and Economic Research (ISSER), Ghana

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Dag-Hammarskjöld-Weg 1-5
65760 Eschborn, Germany
T +49 61 96 79-1435
F +49 61 96 79-7137
E beaf@gtz.de
I www.gtz.de/beaf

Dahlmannstr. 4
53113 Bonn
T +49 228 24934 231
F +49 228 24934 231
E judith.jansen@gtz.de

Pictures by:
International Water Management Institute (IWMI)

Contact:
Dr. Matthew McCartney: M.McCartney@cgiar.org



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