



Preliminary assessment of policies, regulations and institutions required for management of shallow groundwater at local community level in Dangila woreda, Ethiopia

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Background and objectives

Information on groundwater use for irrigation in sub-Saharan Africa (SSA) is poor and data on its extent is unreliable (Giordano, 2006; Villholth, 2013). This reflects the lack of systematic development and management of the groundwater resource (Braune & Xu, 2010). Large scale use for irrigation (either commercial or public projects) is limited and autonomous development of shallow groundwater by individual farmers is the dominant system (Villholth, 2013). Groundwater is more widely used for rural water supply and in this case public sector and NGO projects have provided deeper boreholes. The absence of systematic development and management is again apparent and trends towards decentralisation and privatisation have led to institutional fragmentation (Braune & Xu, 2010).

Groundwater has been described as an extreme case of a common pool resource management problem (Braune & Adams, 2013). It is easy for an individual user to appropriate the resource simply by accessing the groundwater below his/her own land. Indeed, it is the case across much of SSA that groundwater was until recently viewed as 'private water' with entitlement to its use being linked to land ownership. In addition, the problem is further complicated by the fact that groundwater is unseen and poorly understood. Improved governance arrangements are needed to support access to groundwater in an inclusive, equitable and sustainable way. Although evidence from Asia (Molden, 2007) suggests that groundwater irrigation promotes greater inter-personal, inter-gender, inter-class and spatial equity than is found under large scale canal irrigation, there is a significant risk that future development of groundwater resources in SSA will lead to inequitable resource use (Sokile & van Koppen, 2004).

Progress towards achieving good governance of water resources in SSA has been pursued largely through adoption of an IWRM approach. The focus has been on high level policy and the river basin as the management unit, but this has little relevance to groundwater resource management. Groundwater is "a widely distributed but essentially local resource" (Braune & Adams, 2013) and governance initiatives must recognise this reality. There is a need for appropriate social and governance systems to support resource management to achieve sustainable development and to assure equitable access to the resource by poor people. This requires better (gender disaggregated) understanding of how individuals and communities value groundwater and make local decisions regarding its use. Interventions to promote development of groundwater resources must be based on a participatory approach at local community level.

Groundwater governance can be defined as the "range of political, organizational and administrative process through which community interests are articulated, their input is incorporated, decisions are made and implemented, and decision-makers are held accountable in the development and management of [ground]water resources" (Bakker and Morinville, 2013). This study adopts a



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methodology of groundwater governance as collective action (IAD), but further refines the approach by using an approach proposed by Clement and Amezaga (2013), which incorporates political ecology concepts focusing on discourses and power relations in particular political-economic contexts. This framework has been developed further at Newcastle University through active use in water management research in Iran (irrigation from surface and groundwater) and Spain (wetlands management). Whaley and Weatherhead (2014) have highlighted its ability to address contextual factors and power dynamics which, together with its socioeconomic and institutional dimensions, means that it is particularly well-suited to the study of adaptive co-management in interactions between resource users and government.

Progress to date

(i) Stakeholder consultations

Consultations with institutional stakeholders have taken place in Ethiopia, Ghana and South Africa. This document deals only with Ethiopia*. Stakeholder workshop participants agreed that management of shallow groundwater resources must be devolved to local level; woreda level offers advantages of technical expertise together with close engagement with beneficiary households and communities. The AMGRAF proposal to develop and test participatory techniques for adaptive management is seen by key stakeholders as a valuable contribution.

We can expect a general issue that administrative boundaries do not coincide with resource management units; catchment boundaries are likely to cut across woredas; groundwater units may not coincide with surface water catchments; groundwater pumping may have adverse effects on dry season spring flows or stream flows. Governance considerations must therefore allow for co-administration and arbitration on disputes at zonal level and/or regional level.

Discussion of broader legal framework, within which governance arrangement must reside, indicated that there is some ambiguity in Ethiopia. The Civil Code (1960) is believed to be still the applicable law ([http://www1.umn.edu/humanrts/research/Civil%20Code%20\(English\).pdf](http://www1.umn.edu/humanrts/research/Civil%20Code%20(English).pdf)) and states (Art. 1255) that:

- (1) Underground accumulations of water and rivers shall form part of the public domain.
- (2) No person may without permission construct on his land a drilling exceeding one hundred metres in depth.

This supports the view that groundwater has been viewed as 'private water' with entitlement to its use being linked to land ownership. More recent documents exist for the Water Policy (undated) and Water Strategy (2001), but they are not believed to clarify the situation of groundwater resource use and management.

* Outcomes of preliminary discussions with stakeholders in Ghana and South Africa are reflected in the notes on study sites in these two countries.



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(ii) Pilot study at local community level in Dangila woreda, Ethiopia

Assessments of formal and informal institutions for resource management has been based around the sites selected for the technical evaluation in Amhara region. Dangila woreda comprises 27 rural kebeles; three were selected for detailed study on the basis of: (i) access to market and road as proxy of market orientation which is necessary for adoption of groundwater irrigation, (ii) experience in small scale irrigation, (iii) potential of shallow groundwater and experience in evidence of groundwater use for small-scale irrigation. The selected kebeles are: Kwakurta, Gult and Dengesheta.

Using informal participatory enquiry within these sites, the emphasis was on understanding the role of groundwater in the livelihood system and gaining insights into local knowledge of groundwater. The entry point in each kebele was to undertake participatory mapping exercises with groups of women (Figure 1a) and men. After establishing interest in gaining improved understanding, the next step was to test feasibility of participatory assessment of the resource through monitoring groundwater levels, rainfall and streamflow (Figure 1b).



Figure 1: Participatory enquiry at pilot study sites.

Conclusion: lessons learned

The pilot study and associated stakeholder consultations in Ethiopia has confirmed that local level participatory management of shallow groundwater is both necessary and feasible provided that appropriate tools and governance arrangements can be devised.

In the absence of any prior experience with suitable groundwater governance arrangements, it is apparent that the best entry point for local level participatory research will be to build upon other experience with (a) community-based catchment management and (b) farmer-managed irrigation.

Ethiopia has a history of watershed management initiatives dating back to the 1970s. The basic approach has shifted from top-down planning to community-based approaches. There is now a supportive policy and legal framework in the form of policies that facilitate decentralized and



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participatory development, institutional arrangements that allow and encourage public agencies at all levels to work together, and an approach to natural resources that reflects local legislation and tenure practices. Previous work on community-based watershed management has taken place in Dangila woreda.

There are many examples of farmer-managed small-scale irrigation systems throughout Amhara region, including Dangila woreda. Generally they depend on gravity diversions from small streams but there are some examples of pumped supply. The institutional and legal framework designed by the Ministry of Water Resources promotes farmer-managed small-scale irrigation through the establishment of irrigation user communities (IUCs) under the national cooperative law starting from 2002. Recently, 233 IUCs were reported to have been established in the region (CPA, 2010), but their success is variable. Recently prepared (2010) draft regulations for Irrigation Water Users Associations are currently under consideration.

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