

# Stakeholder Workshop and Feedback

The stakeholder session was held on 10 March at the M-Plaza Hotel in Accra. All of the participants were from a range of government and non-government agencies and institutions: Water Research Institute, Water Resources Commission, Hydrological Assessment Project/WRC, University of Ghana, Community Water and Sanitation Agency, Ministry of Food and Agriculture, Ghana Irrigation Development Authority, Kwame Nkrumah University of Science and Technology, University of Cape Coast. Geological Services Department, University for Development Studies, Savannah Research Institute, STEPRI).

The forum was arranged as an open discussion to identify what the key issues in relation to groundwater-based agricultural development across SSA with an emphasis on Ghana. For the purposes of this report, the summary is arranged around:

- 1) the key concerns and additional issues raised
- 2) general discussion on physical and socioeconomic aspects
- 3) site suitability for detailed investigations

## **Concern 1: Where is groundwater, how much is there and what is the quality?**

- Need to understand depths of shallow wells, aquifers
- Mapping aquifer vulnerability
- Resource assessment and demand to support small scale and commercial irrigation opportunities
- Assess age and residence time of groundwater to indicate sustainability
- Need for hydrology map in Ghana; or at least update existing one
- More understanding on aquifers, recharge volumes and areas
- Need for data logging to validate existing data
- Understand how CC affects GW resources
- Consider other users (MUS) and required standards for use
- Need for modeling, like to understand effects of upstream uses on GW downstream
- Consider other issues that could affect quality and irrigation development such as salinity

## **Concern 2: What is the stimulus for farmers to start using GW?**

- Awareness verses policy
- Distance to water sources

- Access to markets for produce

### **Concern 3: Scale verses benefits**

- Individual verse communal systems. General agreement that individual, small scale systems have higher success rates
- Learning from failure: Pumping systems in surface irrigation systems
- Management aspects – WUAs

### **Other concerns**

- Need to agree on common approaches, methods in the project to allow for cross country comparisons
- What are the impacts of groundwater on livelihoods and environment?
- Create a balance between livelihoods and environment. Question of tradeoffs
- Learn from farmers; Their adaptation strategies
- Understand other factors like land tenure
- Better understanding on the economics of drilling, pumps
- Policy support triggers for small scale farmers, eg. government subsidies, improved access to electricity (electrical pumps)

## **PHYSICAL ASPECTS OF GROUNDWATER**

The following came up during the discussions as important research issues. Some overlap while others are at variance to each other. No attempt has been made in this compilation, to substitute one argument for the other as long as it was not agreed that it should be so during the discussion. I have therefore presented them as they were discussed, even though some may appear as opposing to each other. They can be synchronized if need be.

- Depth of the ground water. If the project is to be part-taken by individuals, we have to target shallow groundwater. The target has to be on aquifers ranging between 15-20 meters deep, otherwise it could be too expensive and can fail.
- The project should identify irrigable lands; determine whether to use surface or ground water. If ground water is to be used, at what depth is it available at the irrigable land area? Are the available aquifers in irrigable area shallow or low?
- The project should identify the availability of water aquifers and the most suitable areas for irrigation as is the case in Mali. The project should next determine the cost of lifting the water from the underground to the surface for irrigation. We should also determine the type of irrigation to be undertaken.

- The project is focused on small scale farmers. Lifting water from deep aquifers 200m+ may not be economically viable. We can however have a large irrigation project with several small-scale farmers in it
- We should also be concerned about the age of the available aquifers because this has implication for the rate of recharge and the sustainability of the project.
- The project needs to be specific and clear on what it wants to do. The methodologies should be similar in different country programs to allow for cross country comparison purposes. E.g. we may proceed in this way;
  - Where does the water exist?
  - How much is it?
  - How good is it for irrigation purposes? etc
- The project should also be mindful of the fact that, policies about ground water exploitation may differ from country to country. For instance, aquifers lying 50m below the ground may be considered as shallow water in one country and for which prospective operators do not need permission/license to operate while in another country, this may be considered as deep aquifers and requires permission before exploitation.
- The project also has to fashion out how the resources can be managed in a sustainable manner.
- Groundwater should not also be limited to local use or peasantry, but also commercial cultivation/use for high yielding/value crops.
- The hydro-geological map of Ghana was produced in 1955 and is too old. This needs to be replaced. However, there are more current regional hydrological maps which can be updated, validated and consolidated to produce a new hydrological map.
- Ground water data is largely not available. The project should therefore concentrate on 3-4 sites as pilot schemes to generate data to support the project
- The project should also prepare for cross-border conflict and how to resolve them when they occur since groundwater resources know no political boundaries. Exploitation of the resource in one country can affect availability in a neighboring country.
- Some surface water bodies such as the Volta Lake are strategic national assets. There is the need to determine the relationship between groundwater abstraction and the level of the resource in such surface water bodies
- Ground water modeling is an important tool to get round some of the problems. Models can be adopted to meet the specific needs of different areas

- The project need to do some geological logging to identify the aquifers, the materials in the water, etc

## **SOCIO-ECONOMIC AND INSTITUTIONAL ASPECTS**

The process to get farmers to use ground water for irrigation will be gradual. It took 20-25 years in South East Asia to get farmers to use ground water for agriculture in a sustainable way. Farmers in South East Asia gradually and eventually got concerned about well yields and started to use strategies such as deepening, horizontal boreholes, etc to increase the productivity of the wells. Farmers also eventually learned how to divert run-off water into their fields to recharge their wells. They also started to come together to construct local level recharge structures after they understand the benefit of groundwater to them. In discussing the socio-economic aspects of the project, the following issues also came up:

- There is the need to focus on the cost of the drilling, pumping and maintenance of the water systems. The technology to be used for the drilling, pumping and maintenance should be cost effective. E.g. shallow aquifers up to 12m deep can be reached by hand-dug wells.
- There is the need for education and awareness creation. The stimulus to use groundwater for irrigation in the South East Asian experience was driven by knowledge and awareness. Tomatoes in Northern Ghana and Burkina Faso consumed in major cities like Accra are produced from shallow groundwater. People now make more money by growing tomatoes than migrating southwards to work in cocoa plantations.
- The project also need to learn from the experience of the farmers who are already doing shallow groundwater gardening.
- Irrigation Development Authority (IDA) has been in existence for a long time. They have been depending on surface water – dams, canals, pumps, etc. Even then, the use of surface water is confronted with a lot of problems. Public schemes in particular such as Dowenya and Weija did not do well at all. Individual schemes are better. Hence, if resources are available to lift water from shallow aquifers for farmers to irrigate their farms.
- Though individual schemes may be preferred to public schemes, farmers should not be left alone. They should be supported e.g. subsidized electricity to pump water.
- Area under irrigation in the informal sector is far more than the formal sector
- Recession agriculture has been pursued in Ghana for a long time for growing onions in the Bawku area and along the White Volta. However, government policy is moving out some of these people from their livelihoods. This is because we now understand the environment better and believe there is the need to regulate these activities for long term benefits.

- Production should impact on the lives of the producers and not to worsen their situation. There should be forward and backward linkages with other institutions e.g. marketing
- Land tenure need to be clearly addressed in the project. The issue as to whether the shallow groundwater should be owned by communities or individuals needs to be clarified and known.

## **WHERE THE RESEARCH PROJECT SHOULD CONDUCT DETAILED STUDIES**

From the discussions, the various sites were selected/proposed for the respective countries.

### **Ghana**

There are existing selected areas in the past which were not developed due to lack of funds: e.g. in the Upper East Region (around Mognori), Ejisu-Basiansi, Beyond Akosombo (Keta Basin) and floodplains of major rivers in the Upper West and Northern Regions. These areas are suitable sites for the project.

### **Mali**

Office de Niger – this is because, data is already available on this site. It also has large alluvial plains. Even though Office de Niger is sparsely populated, there is the possibility to expand the irrigation project in this area.

### **Tanzania**

The Pangani Basin is known for its shallow water aquifers and its very fertile soils. Yields potentials

### **Ethiopia**

The representative from Ethiopia could not immediately tell precisely where the project would be located in that country. He intends to consult 2 major stakeholders before finalizing the location of the project in Ethiopia. However, he proposed the Upper Blue Nile Basin as this is also the focus of the Ethiopian government. In addition, the Rift Valley Basin and the Ali Degge Plain in the North Eastern part of the country are possible location sites. These areas have experience in surface water irrigation. The selected project site will definitely be one of these areas.