

Introduction

This brief presents the outcomes of the stakeholder engagement activities, known as “The Dialogue,” in the AgWater Solutions Project. A schematic diagram of the process with main meetings and events is given on page 2 and the key findings are presented.

Project overview

The **AgWater Solutions Project** aims to improve the livelihoods of poor and marginalized smallholder farmers in sub-Saharan Africa and South Asia through **agricultural water management (AWM) solutions**. The project is assessing where and how agricultural water management (AWM) can improve rural livelihoods and reduce poverty. Work focuses on five African countries (Ghana, Burkina Faso, Zambia, Tanzania and Ethiopia) and two states in India (West Bengal and Madhya Pradesh).

In each country the AgWater Solutions Project has followed a consistent methodology: initial research to understand the status of AWM (*situation analysis*) followed by a *national consultation* to discuss findings and distil priorities for field-level research and piloting. In parallel, FAO and IFPRI have been *mapping* the potential for AWM to contribute to poverty alleviation at national and subcontinental levels. A series of workshops (the *AWM Dialogue* led by FAO with National Dialogue Facilitators) have been held at national and subnational levels, to ground truth research findings and identify gaps and priorities for influencing AWM through policy, and links with private sector and farmer groups. The project is now finalized (September 2012) and project findings are packaged into investment recommendations for target stakeholder groups.

AWM Dialogue process

The dialogue aims to consult, discuss and validate possible AWM solution options and suggest priorities for investment at the national level on the basis of scientific references and a good understanding of local knowledge, actors’ needs and preferences. Discussions in the events aimed to understand the causes of adoption or abandonment of some of the AWM interventions, and to enlarge the range of the “possible”. They help the project team explore practical means to forge links between water, poverty and livelihoods in rural areas, in particular by showing how access to agricultural water determines livelihoods and survival in rural areas.

In Ghana, only 1.5% of the arable land is currently under both formal and informal irrigation, despite the ample water resources in most parts of the country. Only relatively wealthy farmers have access to pumps. A Situation Analysis of Agriculture Water management was carried out by IWMI, IFPRI and the Ghana Irrigation Development Authority (GIDA) to review the different types of irrigation in Ghana, how profitable these are and what are the obstacles for wider use of the most promising systems.

Discussions during the National Consultation in August 2010 centred on increasing water storage in small dams in the north, where rainfall is less frequent, improving access to water lifting technologies (WLTs) and better management of lowland valleys where water is easily accessible. AgWater Solutions research focused on these issues and the dialogue events discussed the following:

- Ways of improving access to WLTs, including rural finance, rental markets and farmers’ capacity for agribusiness development.
- Information gaps on dam construction, use of appropriate pumps and pipes, and ways to make production inputs available and affordable.
- Support measures to stimulate WLT use, in particular electricity and rural infrastructure for smallholders.

Ghana AWM Dialogue Team

The National Focal Point is Dr. Ben Nyamadi, Executive Director, Ghana Irrigation Development Authority (GIDA). He has helped link us to the Honorable Minister of Agriculture, the Chief Director of MOFA, the Parliamentary Select Committee on Agriculture and other policy makers in other ministries, notably the Ministry of Energy. His interest in the Project has ensured easy mainstreaming of the findings into government policies, programs and projects.

The National Dialogue Facilitator, Prof. Saa Dittoh, is a rural/agricultural development economist with the University for Development Studies (UDS) in Tamale. One of his main research interests for over 25 years has been the economics of irrigated agriculture in West Africa.

Research coordination is done by Dr. Regassa Namara (IWMI-Ghana). He is a senior Economist & Head of IWMI West Africa with a strong interest on assessing the impacts of irrigation and rural poverty.

The project is implemented by IWMI, FAO, IFPRI, SEI and IDE, with a number of partners in each country - see <http://awm-solutions.iwmi.org/partners.aspx> for more. FAO coordinates a multi-stakeholder dialogue process on AWM in close collaboration with national partners. Each country has a National Dialogue Facilitator who supports the appointed National Focal Point within the relevant government agency. Together they ensure the events are prepared in line with country needs and preferences, receive the relevant inputs from country partners, and are effectively followed up.

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Dialogue Progress

Phase 1: AWS Assessment

AWS Situation Analysis

August 2009 , Accra

National AWM Consultation

July 2010 , Accra

Technical Brainstorming Workshops

- Small dams
- Livelihood mapping and AWM potential
- Gender mapping and AWM patterns

Phase 2: Dialogue

Technical Brainstorming Workshops

April 2011, Accra

- Access to finance for AWM for smallholders: zoom on microfinance

July 2011, Accra

- Livelihood AWM potential and gender mapping
- Technical constraints on AWM technologies: dams construction, water lifting and drilling

Regional Consultation and Technical Workshops

July 2011, Kumasi

- Access to finance for AWM for smallholders

July 2011, Accra (for southern sector)

- Technical constraints on AWM technologies: dams construction, water lifting and drilling

August 2011, Tamale

- Smallholder access to inputs (chemical and physical)
- Technical constraints on AWM technologies

November 2011, Tamale

- Mutistakeholder consultation on AWM technologies
- Validation of Livelihood zone AWM mapping

Phase 3 Information for Action

14 Meetings

400 Stakeholders + Many more from outreach

OUTREACH ACTIVITIES

NATIONAL, REGIONAL and INTERNATIONAL

2011

October

Exchange visit of Indian groundwater expert to Ghana.

November

ICID regional conference in Bamako (presentation on motor pumps)

2012

January

Learning route of the national facilitators & national focal points (Burkina, Ghana, Ethiopia, Zambia, Tanzania, India-MP, India-WB) to Madhya Pradesh to visit promising agriculture water management solutions.

March

World Water Forum, Marseille, France (presentation on small pumps ; and groundwater issues)

May

Land and water days @ FAO (presentation on small dams, presentation on individual water lifting devices, presentation on the Dialogue process in GH)

March 2012, Accra

- **Technical Workshop** Electricity and rural roads for irrigation

June 2012, Accra

- Policy level workshop, Electricity and irrigation in Ghana

September 2012, Accra

- Memo on rural electrification and agriculture presented to Cabinet

Ongoing Dialogue events

Briefing of District Chief Executives and Traditional Leaders (Chiefs) at their scheduled meetings on AWM findings and their expected roles to promote smallholder irrigated agriculture in Ghana.

Face-to-face briefing of Ministers and top policy-makers on the project's findings and the required next steps to ensure adequate support to smallholder irrigators

Representatives of the investors and donor agencies in the country will also be briefed on the project's findings as a basis for discussion of their priorities for investment in support to smallholder farmers. Follow up products will be developed accordingly to propose avenues for their engagement in AWM.

Main findings from the dialogue events

This section summarizes the feedback received from participants during the various dialogue events on the suitability and feasibility of the AWM options analyzed, as well as financing needs and options to explore, together with investments required on information and training needs

Water lifting technologies

In Ghana, river pumping systems are the most common but there is high potential for use of groundwater for irrigation in several parts of the country. Further research is needed to map its potential and identify measures that ensure it is used sustainably **(RC SS; RCM)**.

Pump availability

There are large price and quality variations in pumps. This can be addressed by providing information on pump types, prices, quality and specification through registries of pump dealers; pump availability and accessibility; and on financing possibilities.

In the medium term, participants in the regional consultation in Kumasi suggested that the Ministry of Food and Agriculture (MOFA) and District Assemblies procure and sell pumps and accessories to irrigators **(RC K)**.

Irrigators often make poor decisions with regard to the acquisition and use of pumps and pipes. They should be able to consult MOFA or GIDA personnel, private companies and NGOs on technical specifications of a range of WLT equipment. The lack of irrigation extension by MOFA/GIDA is considered to be hampering the adoption of small pump use **(RC SS)**

Pump affordability

Lower costs of irrigation

Rural electrification could reduce the cost of pumping as electric pumps are less expensive to run than diesel and petrol pumps. Currently, the rural electrification strategy and pricing policy do not consider agriculture. The government should extend power to potential irrigable sites and reduce cost of power for agricultural use. Electric pumps should be promoted because they are cheaper to buy and operate. The government should consider instituting a well-thought-out and targeted subsidy system. Improvement in the credit provision can also help. **(TBW D)**

Following a technical workshop on 28 and 29 March 2012 on Agriculture–Energy Policy linkages in which the Chair of the Parliamentary Select Committee on Food and Agriculture and another MP member of the Committee as well as several other key stakeholders participated, a draft memo was produced for the consideration of Cabinet and Parliament. The Ministry of Food and Agriculture/GIDA is liaising with the Ministry of Energy to present a joint memo to Cabinet in September 2012. **(TBW E)**

The use of appropriate technologies and better physical explorations could reduce high drilling costs. **(RC SS)**

Support emerging rental markets

Although rental markets are yet widely accepted in Ghana, there is potential for them as pump irrigation picks up across the main irrigation areas in the country. **(all)**

Access to rural finance

There is need to ensure capacity building of the finance experts about AWM and the AWM experts about financing. Farmers' demand for financial products and services is large but scattered and they have low negotiation capacity, whereas the supply of financial products and services is centralized, organized and limited in availability.

Rural credit from official sources is rare. The current micro-finance institutions and products need to be reviewed and packages tailored to AWM-related needs (e.g., lending to groups, repayment schedules adjusted for farmers' needs, etc.).

Microfinance institutions lack a policy framework that would enable them to source external funds, e.g., from donors and other forms of external investments and partnerships. They are not insured by the Bank of Ghana (i.e., they do not have insurance deposits with the Bank of Ghana), so that the customers/farmers are always at risk **(TBW D)**.

National Technical Brainstorming Workshops

- Livelihood Mapping and AWM for smallholders, July 2010 (TBW A)
- Gendered Farming systems in Ghana, July 2010 (TBW B)
- Technical Seminar on small dams, "What roles for multipurpose small dams in Ghana", 16 July 2010 Accra.(TBW C)
- Access to finance for AWM for smallholders: microfinance. April 2011, Accra (TBW D)
- Policy for Electricity and Irrigation in Ghana. 28-29 June 2012. Accra (TBW E)

Regional Consultations

- Access to finance for AWM for smallholders; July 2011, Kumasi (RC K)
- Technical constraints on AWM technologies: dam construction, water lifting and drilling. July 2011, Accra for Southern Sector (RC SS1)
- Livelihood and gendered potential mapping. July 2011, Accra (RC SS2)
- Smallholder access to inputs. August 2011, Tamale (RC T)
- Technical constraints on AWM technologies. August 2011, Tamale (for northern sector) (RC NS)
- Livelihood and gendered potential mapping. August 2011, Tamale (RC M)
- Electricity and rural roads for irrigation. March 2012, Accra (RC A)

AWM Solution event briefs

Visit AWM Solutions website to download:

<http://awm-solutions.iwmi.org/publications-and-outputs.aspx>

- AWM Situation Analysis in Ghana, 2009
- AWM National Consultation, August 2009, Accra regions/BFA/indexfra.stm



A regulatory framework is needed for the microfinance sector to protect farmers and other users.

Poorer farmers who are not yet market-oriented need to be informed about grant funding options **(RC K)**.

Improving agribusiness capacity

Financial institutions lack confidence that farmers will succeed and, therefore, building farmer's agribusiness capacity, including financial management is key **(RC K)**. Technical assistance is required all along the produce value chain in: agronomy-water productivity, soil conservation, and crop diversification as a way to manage risk, input use (agro-chemicals and organic manure in the production of vegetables and other irrigated crops), produce storage, marketing and crop insurance **(RC K; RC T)**.

Training on the selection and efficient use and maintenance of irrigation equipment will also be required. It was pointed out during the Regional Consultation in Accra **(RC SS)** that farmers often use inappropriate pipes and/or are unfamiliar with their required upkeep (too much exposure to sunshine). The lack of irrigation extension by MOFA/GIDA is also hampering the realization of the high potential profitability of irrigation in the country. A plan is being developed to address this **(RC K; RC T; RC SS)**.

Improve input supply chains: Break the "monopoly" of some chemical companies in the distribution of seeds and agro-chemicals, improve the supply of fertilizers and extend the prevailing fertilizer subsidy scheme to irrigated farming **(RC T)**.

- Market development for fresh produce could be achieved through: setting up farmer markets; regulating brokers' networks; formulation of policies to encourage consumption of local produce; and investment in storage and processing facilities **(RC K)**.
- Provide basic infrastructure like roads and electricity for potential irrigation areas **(TBW A)**.
- Irrigation planning: irrigation schemes should be designed with the farmers' requirements in mind. Identify ecological zones to determine what to irrigate, where to irrigate and what type of scheme to use. The economics of crops to be irrigated should be considered before irrigating, and research should be on how high-value crops grown in other countries can be irrigated in Ghana **(RC K)**.
- Landownership and land tenure problems (water accessibility is dependent on landownership/occupation): The government should accelerate the land registration project. Land and legal frameworks should be clarified to allow farmers to use land as collateral for loans **(RC K, RC SS)**.

Dam design

The use of small dams for irrigation is relevant, cost-effective and will effectively contribute to food security and income generation in rural communities if managed properly. Small-scale dams have been helpful but in some cases, there is underutilization of dams and dugouts by farmers. Recommendations to address the shortcomings of dams include:

- Standard designs should be updated, published, disseminated and enforced by GIDA. Brochures should be printed. Stakeholders should be given training on standards.
- Staff skill development: GIDA should consider training staff and contractors and enter into performance contracts with them.
- Capacity of contractors (personnel and equipment): The contractors need to be trained by GIDA. There should be a leasing company with all the equipment available, this should be facilitated by GIDA. Financial due diligence should be done on all contractors before contracts are awarded to them. This should be done by the financier (government, NGOs) through checks from the banks.
- Small dams land acquisition (who pays for the land to be used?): Landownership should be taken into consideration before construction of dams and dugouts. The ability of the communities to decide on how land should be shared for irrigation purposes is often a problem. The solution would be to have community bylaws and specific social criteria for the construction of community dams. With regard to water use rights, especially of the big dams, government should take responsibility and set regulations.
- Construction costs of dams are high. Cost overruns (delays in payment); high costs of labor and materials all contribute to making construction costs high. There is a need for rigid enforcement of priority and GIDA should have basic construction equipment.

AWM Solution research briefs

Visit AWM Solutions website to download:

<http://awm-solutions.iwmi.org/publications-and-outputs.aspx>

- Water lifting
- Low land valleys
- Shallow groundwater
- Small reservoirs (cross-country)



Other relevant research (IWMI-Ghana)

- Gender in Agricultural Water Technologies Adoption and Management in Ghana
- Outgrowers (contract-farming) and other institutional innovations in irrigation
- Potential of drip irrigation in the context of climate change



AgWater Solutions Project Outcomes

The AgWater Solutions Project has provided inputs for the revision of the national irrigation strategy and the strategies of some NGOs. This has been achieved through continuous engagement by the National Dialogue Facilitator with MOFA and GIDA at national, regional and district levels as well as NGOs, which has generated an active exchange.

Attention is now being strongly focussed on small dams and groundwater by governmental agencies and some NGOs.

Mapping for dialogue and decision making

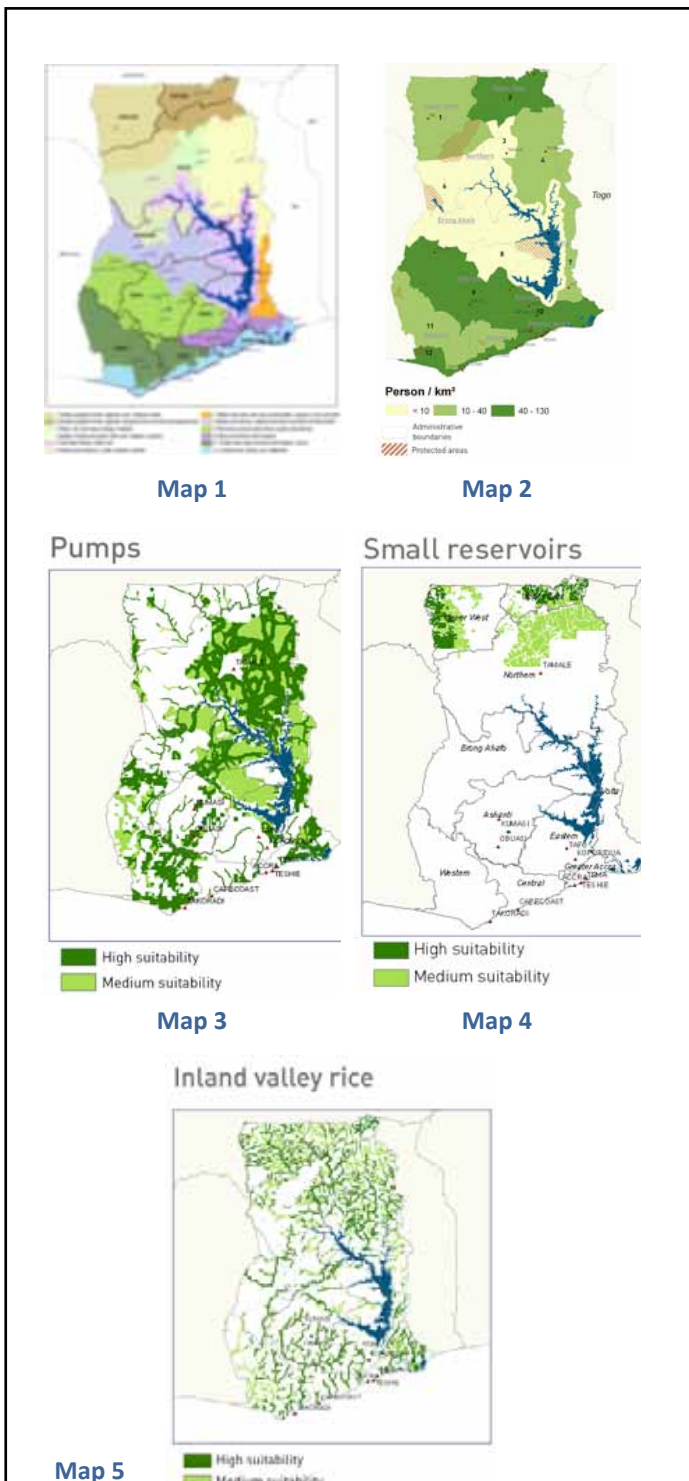
Maps can help stimulate discussion and visualize where to invest. The basis for the AWM potential mapping is the livelihood context (biophysical and socioeconomic determinants), captured in the Livelihood Zones (Map 1) through an iterative consultation, data gathering and desktop analysis process. The livelihoods context combined with hypothesis on conditions for success for AWM development allows to identify the “AWM Potential”: areas where water constraints are a major factor affecting smallholder livelihoods and where AWM can be the entry point to boost the livelihoods of farmers (Map 2).

The following step is identifying AWM practices which are most suitable in each Livelihood Zone. First, considering their biophysical suitability, like rainfall, hydrological network, and soil type (Map 3 to 6) and then linking that with the demand for a given practice by livelihood zone (based on farmers’ typology and their ability to invest in improved AWM practices).

The mapping process has gathered stakeholders’ feedback through three major workshops:

- July 2010: Livelihoods Mapping Workshop (TBWA)
- July 2011 and August 2011: Livelihood AWM Potential and Gender Mapping (RCSS ; RC NS2)
- November 2011: Technical Brainstorming Workshop on AWM Potential and Suitability Mapping

Maps, being a very effective communication tool in soliciting feedback, have, on the other hand, supported the dialogue process in various events.



AWM Potential and Suitability Mapping

- Livelihoods Zones in Ghana (Map 1)
- Potential for Poverty Alleviation through AgWater Management (Map 2)
- Suitability of AWM Technologies:
 - Low-cost pumps (Map 3)
 - Small dams (Map 4)
 - Inland Valley Rice (Maps 5)

Physical suitability for three small pumps has been assessed on the basis of: travel time to market (defined as centers of 20,000 inhabitants or more), with areas at 4 hours or less considered highly suitable (areas at more than 8 hours excluded), proximity to surface water, and occurrence of soils with shallow groundwater potential.

Livelihoods context is assumed to be more favorable in zones with relatively higher prevalence of market-oriented smallholder farmers and high population density.

A suitable area for small dams has been assessed using Aridity Index (where yearly precipitation divided by yearly reference evapotranspiration is between 0.2 and 0.65, semiarid to dry-subhumid); in addition, a higher livestock

density is assumed to favor the multiple uses of small dams.

Suitable area for inland valley rice is defined using slope (< 2%), proximity to rivers, and classified using the Global Agro-ecological zones index of land suitability for wetland rice.

A higher suitability is also attributed to areas closer to market centres.

A key element to consider in further assessment are related to the gender roles in farming systems. In systems where women are head of the household, it is important to target them specifically. (gendered farming systems workshop (RCSS).

For more information:

Report Livelihood zones analysis, 2012. http://www.fao.org/nr/water/docs/GHA_LZ_analysis.pdf

Country Investment Brief. 2012. http://www.fao.org/nr/water/docs/Country_Investment_Brief_Ghana.pdf.