

Training Workshop on the Small Reservoirs Dashboard: From Data to Decision

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CGIAR Sustainable Animal and Aquatic Foods Program

The Sustainable Animal and Aquatic Foods Program, launched by CGIAR, focuses on sustainably transforming animal and aquatic food systems to foster inclusive, healthy and nutrient-dense food supply chains. It aims to address the challenges faced by low- and middle-income countries, particularly in the Global South, by providing access to nutritious foods while minimizing environmental impacts and supporting inclusive livelihoods. <https://www.cgiar.org/cgiar-research-portfolio-2025-2030/food-frontiers-and-security/>

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Front cover photo: Workshop participants gathered at the University of Development Studies (UDS), Nyankpala Campus, Ghana (*photo*: UDS Media)

Back cover photo: Participants engaged at the workshop session (*photo*: UDS Media)

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Background and Objectives

Small reservoirs play a vital role in West Africa's water infrastructure, though much of their capacity remains untapped. Through the CGIAR Aquatic Foods Initiative (2022–2024), now SAAF, the International Water Management Institute (IWMI) and partner organizations; Fisheries Commission of Ghana and CSIR Water Research Institute identified and mapped more than 2,000 community-level reservoirs spread across Ghana's five northern regions — North-East, Northern, Savannah, Upper East, and Upper West. Beyond supporting dry-season crop irrigation, these water infrastructures serve livestock and household water needs, forming a backbone for livelihoods and food security in the region's semi-arid environment. A range of methods were used to develop a robust evidence base: satellite image time-series analysis for monitoring dry-season water levels, field surveys capturing data on reservoir uses and infrastructure, expert input to establish aquaculture viability criteria, and geospatial modelling for suitability assessment and tracking.

This body of work led to the creation of the [Small Reservoirs Data Portal](#), a Power BI–driven platform that presents data on over 2,000 reservoirs in an accessible, visual format. Users can explore and analyze both spatial and field-collected data to address key questions: Where are these reservoirs? Do they retain water throughout the year? Under what conditions might they support cage-based fish farming? By making this spatial evidence readily available, the portal aims to facilitate the expansion of caged aquaculture across northern Ghana — supporting informed planning, ongoing monitoring, and evaluation while promoting the sustainable, multi-purpose use of small reservoirs for food and water security.

The CGIAR Sustainable Animal and Aquatic Foods (SAAF) Program now aims to embed this decision-support tool within institutional workflows to accelerate data-driven planning. As part of this effort, the Department of Aquaculture and Fisheries Sciences (DAFS) at the University for Development Studies (UDS) hosted IWMI for a training workshop on 30 January 2026 at the Nyankpala Campus. The objectives of the workshop were to empower participants to independently use the Small Reservoirs Dashboard to answer practical questions related to small reservoirs, equip students and faculty with practical skills to navigate the portal and extract insights on water dynamics, multi-use functions, and aquaculture suitability, and to strengthen the application of these outputs in research, extension services, and policy dialogues. The workshop further aimed to foster collaboration between DAFS and IWMI, laying the groundwork for joint research, student engagement, and practical application of digital tools in aquaculture and water resource management.

Workshop Structure

The training was organized by IWMI in collaboration with the Department of Aquaculture and Fisheries Sciences under the Faculty of Biosciences. The workshop began with welcome and opening remarks from Prof. Emmanuel D. Abarike, Head of Department, Aquaculture and Fisheries Sciences. Dr. Komlavi Akpoti then delivered a session on data sources, portal structure, and navigation overview, introducing participants to the technical foundations of the Small Reservoirs Dashboard. This was followed by a hands-on session on visualizing water status, where participants learned to visualize the evolution of surface area during the dry season from November to April. The next session focused on the characterization module, covering multiple uses, irrigation infrastructure, water quality, aquaculture potential, and accessibility metrics. After a brief coffee break, a session on aquaculture suitability was co-facilitated by Dr. Komlavi Akpoti and Ms. Sarah Appiah, guiding participants through the multi-criteria suitability assessment. A group discussion and brainstorming session followed, during which participants explored the potential use of the dashboard in their research and academic work. The workshop concluded with closing remarks and a summary of key takeaways.

- Participants

The workshop brought together 52 participants including students and staff from the University for Development Studies with a focus on aquaculture, water management, and environmental sciences. Students from the Faculty of Biosciences and selected departments within the Faculty of Natural Resources and Environment participated in the training, gaining hands-on experience in using the dashboard. UDS staff participants included Prof. Emmanuel D. Abarike (Head of Department, Aquaculture and Fisheries Sciences), Prof. Seth M. Abobi (Academic Advisor, Faculty of Bioscience), Ms. Kezia Baidoo (Lecturer), Ms. Edwina Avatim (Administrator), Mr. Mohammed J. Wumbadoo (Fish Farm Technician), Dr. Abdul Mumeen Iddrisu (Head of Department, Biochemistry), and Dr. Julious Dongsogo (Lecturer). The workshop was facilitated by IWMI experts Dr. Komlavi Akpoti and Ms. Sarah Appiah, and was convened with the support of Prof. Daniel N. Akongyuure, Vice Dean of the Faculty of Biosciences. Table 1 summarizes the participants by gender.

Table 1. List of Participants

Participant Category	Male	Female	Total
Academic Staff and (Professors and Lecturers)	5	1	6
Students	25	14	
IWMI Facilitators	1	1	2
Other University Technical Staff	2	3	5
Total	33	19	52

Key Discussions and Outcomes

This section provides an overview of the key discussions, findings, and outcomes from the workshop. It begins by summarizing the core messages conveyed through presentations and live demonstrations, followed by participant feedback including observed challenges and suggested solutions and concludes with agreed-upon priorities and action items for follow-up.

The workshop commenced with introductory remarks framing the training within the context of CGIAR SAAF Program's goal of integrating the Small Reservoirs Dashboard into institutional decision-making processes. Prof. Emmanuel D. Abarike opened the session by welcoming the IWMI team and underscoring the significance of evidence-based tools for advancing aquaculture in northern Ghana. It was acknowledged that while small reservoir aquaculture pilots have yielded encouraging results, expanding these models at scale demands robust monitoring systems. The dashboard was presented as an advanced decision-support platform that combines satellite-derived observations with ground-level survey data, allowing users to track water availability, observe seasonal patterns, and evaluate aquaculture potential across over 2,000 community reservoirs in the region. Dr. Komlavi Akpoti facilitated the technical sessions, starting with an introduction to the data sources underpinning the portal, its architecture, and basic navigation. He outlined how satellite image time-series are employed to map reservoirs, detect changes in water surface area throughout the dry season (November–April), and cross-check findings against manually digitized boundaries and field observations. He further explained how on-the-ground surveys enriched the remote sensing analysis by collecting information on reservoir functions, ownership structures, water quality conditions, irrigation infrastructure, and current aquaculture activities across more than 900 sites. In addition, he emphasised that expert consultations contributed additional criteria for assessing aquaculture viability, ensuring the framework reflected both local expertise and practical realities. These datasets were synthesized into a geospatial suitability model that weighs social, economic, biophysical, and water quality parameters to identify reservoirs with the greatest potential for cage-based aquaculture expansion.

Subsequent sessions focused on introducing and demonstrating the Small Reservoirs Data Portal, an open-access digital platform built to consolidate, query, and visualize information on over 2,000 small reservoirs across northern Ghana. Dr. Komlavi Akpoti walked participants through its four principal modules: (i) Monitor Water Status, which tracks seasonal fluctuations and year-round water retention; (ii) Visualize Reservoir Dynamics, offering map-based and graphical representations of surface area changes over time; (iii) Characterize, which links detailed survey findings from over 900 reservoirs covering uses, ownership, infrastructure, and aquaculture practices to individual sites; and (iv) Aquaculture Feasibility, which applies a multi-criteria assessment combining social, economic, and biophysical indicators to rank reservoir suitability. Figure 1 shows a segment of participants at the workshop.



Figure 1. Participants attentively listening during the workshop (*photo: UDS Media*)

Dr. Komlavi Akpoti and Ms. Sarah Appiah subsequently guided participants through a structured, hands-on walkthrough of the portal, progressing from straightforward regional and district-level queries to more complex filtering and suitability analyses. Students and faculty practised zooming into specific reservoirs, reading seasonal performance charts, and applying aquaculture feasibility filters based on criteria such as perennial water availability, site accessibility, and proximity to markets. Illustrative case studies notably Langbensi reservoir, which demonstrated consistent year-round water retention, and Bilmi Mogri, which exhibited unusual drying patterns in 2023–2024 showed how the portal can reveal contrasting reservoir conditions and inform monitoring, evaluation, and planning decisions. Through these exercises, participants gained practical experience in applying filters, extracting time-series datasets, and producing outputs relevant to research, agricultural extension, and policy engagement.

Towards the end of the workshop, participants were invited to complete an online survey to provide structured feedback on the sessions and the dashboard demonstration. The survey aimed to capture participants' impressions of the tool's usability, the effectiveness of the training exercises, and priorities for future improvements. Facilitators emphasized that the feedback would be incorporated into the next iteration of the dashboard and would help shape ongoing capacity-building activities.

In his closing remarks, Dr. Komlavi Akpoti thanked the UDS participants for their active engagement and enthusiasm in exploring the dashboard. He stressed that the Small Reservoirs Data Portal is not a finished product but an evolving tool that will be strengthened through user input, institutional collaboration, and continued research. He also reiterated that aquaculture expansion in small reservoirs must proceed with community consent, policy alignment, and sustainable management practices. Prof. Daniel N. Akongyuure, Vice Dean of the Faculty of Biosciences, noted that “the engagement has laid a strong foundation for sustained collaboration” between DAFS and IWMI. The workshop ended with appreciation for participants' contributions and a call for continued collaboration to integrate the dashboard into UDS teaching and research programmes, refine the tool for local relevance, and develop capacity-building activities in remote sensing and hydrologic modelling.

Annex

Workshop Agenda (UDS Nyankpala Campus, 30 January 2026).

Time	Session	Facilitator
08:30–09:00	Arrival and registration of the participants	Sarah Appiah
09:00–09:15	Welcome & opening remarks	Prof. Emmanuel Abareke
09:15–09:35	Data sources, portal structure, navigation overview	Komlavi Akpoti
09:35–10:00	Visualize water status: Visualize the evolution of surface area during the dry season from November to April	Komlavi Akpoti
10:00–10:20	Characterize: Multiple use, irrigation infrastructure, water quality, aquaculture, and accessibility.	Komlavi Akpoti
10:20–10:30	Coffee Break	Sarah Appiah
10:30–11:00	Aquaculture suitability	Komlavi Akpoti/ Sarah Appiah
11:00–11:45	Group discussion & Brainstorming on the potential use of the dashboard	Komlavi Akpoti/ Sarah Appiah
11:45–12:00	Closing Remarks & Summary of key takeaways	Komlavi Akpoti/ Prof. Emmanuel Abareke
12:00–1:00	Lunch	



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