

TERMS OF REFERENCE

Aquatic food initiative in Ghana

1. BACKGROUND OF THE RESEARCH PROJECT

Northern Ghana is characterized by rainfed agriculture with very low development of groundwater irrigation, low agricultural productivity, and high poverty rates. Climate change induced uncertainty in rainfall intensity and timing is likely to contribute to a worsening situation in the region. Thus, lack of irrigation access is a core challenge in northern Ghana for boosting agricultural production and reducing poverty levels. The reason for the very limited spread of groundwater irrigation is due to large variations in geology and climate leading to complex hydrology and the high costs and well-failure risks associated with tubewell construction (Forkuor et al. 2013). In this context, the government had started constructing small earth dams in five of the poorest regions of Northern Ghana under the “One Village, One Dam” project (starting in 2017 with a target of 570 dams in total). The objective is to provide water access to rural communities all year round for dry-season irrigation and other uses including livestock and domestic water uses.

This also creates a unique opportunity for a greater degree of multi-purpose use of these water infrastructures by introducing aquatic food production in these small earth dams. It can benefit the communities through increased income, improved nutrition, and empowerment of marginalized groups (women, small farmers). The “Resilient Aquatic Food Systems for Healthy People and Planet” initiative by CGIAR will be working in collaboration with government departments (agriculture, fishery), NGOs, and rural communities to co-design and upscale aquatic food production in these small earth dams in northern Ghana (Allison and Buisson 2021). This intervention will also be accompanied by appropriate institutional models of managing land and water that will make it possible for inclusive and sustainable scaling up of aquatic food production in small earth dams of Northern Ghana.

As part of this project, an aquaculture pilot is being implemented in 4 reservoirs in the North-East region by IWMI in partnership with the CSIR Water Research Institute and the Fisheries Commission. The communities using the reservoirs will receive training and initial investment to carry out fish farming.

This research work has four main objectives: (1) characterize the current uses of small reservoirs in northern Ghana; (2) study the suitability of small reservoirs for aquaculture; (3) assess the socio-economic impact of the aquaculture pilot in the North-East region; (4) evaluate scaling opportunities and bottlenecks for aquaculture in small reservoirs in northern Ghana.

To support this research, a household and community survey will be conducted in two regions of northern Ghana: in the North East region, where the pilot is taking place, and in the Upper East region, where IWMI researcher have mapped small reservoirs using remote sensing techniques (Ghansah et al. 2022).¹ The target sample size is 80 reservoirs and 1400 households. Moreover, a short reservoir-level survey will be administered in the approximately 350 reservoirs in all the 5 regions of northern Ghana.

¹ Ghansah, B., Foster, T., Higginbottom, T.P., Adhikari, R., Zwart, S.J.: Monitoring spatial-temporal variations of surface areas of small reservoirs in Ghana’s Upper East Region using Sentinel-2 satellite imagery and machine learning (2022). <http://doi.org/10.1016/J.PCE.2021.103082>

2. *PURPOSE OF THIS ASSIGNMENT*

IWMI is looking for an organization who will support our work by leading data collection in northern Ghana. IWMI will develop the survey instruments and the sample design. However, the vendor will be encouraged to provide input and feedback based on their experience and knowledge of the local context.

3. *TASKS AND RESPONSIBILITIES*

ACTIVITY 1 – Household survey

This activity will be conducted in the first half of 2023 and will include approximately 1400 households in the communities utilizing 80 reservoirs in the North East and Upper East regions. A community questionnaire will also be administered to the leaders of each of these communities.

The potential sections that will be included in each of the questionnaires are listed in the table below:

Household questionnaire	Community questionnaire
Section 1 – Household demographics (incl. migrations) Section 2 – Livelihoods (incl. agriculture, livestock, fisheries and others) Section 3 – Vulnerability and responses to shocks Section 4 – Youth and women empowerment (intra-household agency) Section 5 – Time allocation Section 6 – Health Section 7 – Nutrition and food security Section 8 – Household wealth and assets ownership	Section 1 – Village demographics and socio-economic characteristics Section 2 – Access to infrastructures and services Section 3 – Shocks Section 4 – Social networks Section 5 – Reservoirs and water security

Moreover, qualitative data collection will be conducted in some of the communities in the sample, this includes a maximum of 20 Focus Group Discussions (FGDs) and 20 Key Informants Interviews (KIIs).

The vendor will be responsible for the following activities:

1.1 Survey preparation

- **Adapt the survey instruments to the local context and translate them into local languages.**

IWMI will provide draft survey instruments in English. These include a household questionnaire, a community questionnaire, and qualitative data collection guides for the FGDs and the KIIs. The vendor is responsible for reviewing the survey instruments and ensuring all questions are framed in a way that correctly considers the local context.

The vendor will also be responsible for translating the survey instruments into all the local languages in which the fieldwork will be conducted, translate them back into English by a different person, and ensure that the translation correctly reflects the original English version.

- **Program the questionnaires.**

The vendor is responsible for programming the questionnaires using a data collection software (Survey Solutions, Survey CTO, etc.). The vendor will share a programmed version of the questionnaire with IWMI researchers ahead of fieldwork.

- **Pretest questionnaire.**

The vendor will pretest the household questionnaire and the qualitative survey instruments, and provide feedback to IWMI, with recommendations on how to modify, add or remove to increase their effectiveness for the intended purpose. Particular attention will be paid to the responses 'other' which should be systematically reported and specified to include new codes, if required.

- **Obtain authorizations for data collection and inform the authorities.**

While IWMI will provide a letter introducing the project and obtain IRB approval, the vendor is responsible for making sure that their organization has secured all permissions and authorizations for collecting data and sending enumerators into the field. Similarly, representatives from the local government institutions should be informed of the data collection by the vendor.

Throughout the whole process, the vendor and all staff will treat all survey subjects with courtesy and respect and take all steps to respect their privacy (such as in the choice of settings to collect personal or household data) and to protect the confidentiality of information that has been collected.

1.2 Quantitative data collection

- **Provide experienced enumerators to implement the surveys.**

The provision of experienced enumerators is the responsibility of the vendor. Particular attention should be given to the prior experience of the enumerators in implementing quantitative surveys in field settings. The enumerators should have good knowledge of the rural context in northern Ghana. The team of enumerators should be able to communicate easily in the local languages.

- **Provide electronic devices for data collection.**

The vendor will administer the household and community survey using electronic devices such as tablets. The vendor will provide tablets to enumerators and will also design the data entry templates to replicate the questionnaire into the electronic devices. The vendor will be responsible for all technical aspects related to the use of tablets including providing adequate power to the devices, and daily back-up of the data collected.

- **Train the enumerators.**

The training of the enumerators will be undertaken before the survey begins. The training should include a classroom part to define the questions and then a practical part (in the field). The vendor

will be responsible for organizing and for leading the training. IWMI researchers will participate in the training.

- **Collect household lists.**

- The vendor will collect lists of all the households in the communities using the 80 reservoirs. In case a reservoir serves multiple communities, the community closest to the reservoir will be chosen.
- These lists should provide some basic information on the household's use of the reservoirs (irrigation, fishing, other purposes). IWMI will provide a short questionnaire for this data collection exercise.
- The data should be collected using tablets and will be used for the final selection of 15 households in each community with selecting rules provided by IWMI

- **Finalize the sample.**

- To the initial sample of 1200 households, the vendor will add an additional sample of approximately 200 households from the 4 communities selected from the pilot and a set of 10 communities selected as "control group." These communities will all be included in the original set of 80 communities.
- IWMI will provide detailed information on which communities to include in this exercise and how to select the households to be included in this sample.
- In each pilot community, 10-15 households that directly benefit from the project will be included in the sample. In each control community, the vendor will coordinate with community leader to select 10-15 households that would satisfy the pilot's eligibility criteria.
- The final sample will include approximately 1400 households.

- **Implement the community questionnaire.**

The community survey will be implemented in each of the 80 communities selected. The questionnaire will be administered to a community leader or a knowledgeable person from the community. The survey will take approximately 20 minutes. In total, 80 community surveys will be administered, one per community.

- **Implement the household questionnaire.**

The household questionnaire will be implemented to approximately 1400 households in the 80 communities selected. The household questionnaire is expected to take 60 to 80 minutes.

- **Provide and manage all the logistics of data collection.**

The vendor will be responsible for the organization and for all costs related to the survey administration, oversight and quality control. This should include the provision of electronic devices, the printing of materials (maps, sample lists, code lists...), staff travel and accommodation costs, staff costs, data compilation, and quality checking.

- **Data quality checks and post-survey verifications.**

The vendor will be responsible for checking the data during and after collection. In cases of problem or inconsistency detected either by the vendor or by IWMI, the vendor will be responsible for contacting the respondents again and clarifying/correcting the data for transmittal to IWMI. This applies equally to each of the survey instruments.

1.3 Qualitative data collection

- **Focus Group Discussions**

The vendor will provide a facilitator to conduct up to 20 Focus Group Discussions (FGD) with groups of community members in the selected communities. The guidelines will include quantitative and qualitative questions and will be developed by IWMI in consultation with the vendor.

- **Key informant interviews**

The vendor will provide a facilitator to conduct Key Informant Interviews (KII) with key stakeholders including fish farmers, extension agents, government representatives, and community members. A maximum of 20 KIIs are expected. The guidelines will include quantitative and qualitative questions and will be developed by IWMI in consultation with the vendor.

- **Transcripts and database from the Key Informant Interviews and Focus Group Discussions**

The vendor will provide written transcripts from the FGDs and KIIs conducted. The vendor will also be responsible for data entry of the quantitative questions included in the KII and FGD guidelines and deliver the corresponding datasets, clean and ready to use for analysis by IWMI researchers.

1.4 Outputs to be submitted.

- **Finalized translated questionnaires and programmed data collection tools.**

- **Datasets in STATA format**

- List of households in each community.
- Community questionnaire dataset.
- Household questionnaire dataset.
- The datasets delivered from the vendor should be clean and ready for analysis by IWMI researchers.

- **Qualitative data collection outputs**

- Transcripts and database from FGDs and KIIs

ACTIVITY 2 – Reservoir suitability survey.

This activity will be conducted in the second half of 2023 and will include a maximum of 450 short surveys administered at the reservoir level to knowledgeable people across the 5 regions of northern Ghana (see Annex 1 for a map). The purpose of this exercise is to collect the necessary data to evaluate the suitability of the reservoirs for aquaculture.

2.1 Survey preparation

- **Program the questionnaires.**

IWMI will provide the questionnaires. The vendor is responsible for programming the surveys in a software that allows for electronic data collection.

- **Obtain authorizations for data collection and inform the authorities.**

While IWMI will provide a letter introducing the project and obtain IRB approval, the vendor is responsible for making sure that their organization has secured all permissions and authorizations for collecting data and sending enumerators into the field. Similarly, representatives from the local government institutions should be informed of the data collection by the vendor.

2.2 Data collection

- **Provide enumerators to implement the surveys.**

The vendor is responsible for providing enumerators to implement the survey. The enumerators should have some knowledge of the context in northern Ghana.

- **Provide electronic devices for data collection.**

The vendor will administer the household and community survey using electronic devices such as tablets. The vendor will provide tablets to enumerators and will also design the data entry templates to replicate the questionnaire into the electronic devices. The vendor will be responsible for all technical aspects related to the use of tablets including providing adequate power to the devices, and daily back-up of the data collected.

- **Train the enumerators.**

The training of the enumerators will be undertaken before the survey begins. The training should include a classroom part to define the questions and then a practical part (in the field). The vendor will be responsible for organizing and for leading the training. IWMI researchers will participate in the training.

- **Implement the reservoir suitability questionnaire.**

The survey will be conducted in each of the reservoirs selected². The questionnaire will be administered to an extension worker or a knowledgeable person from the area in which the reservoir is located. The survey will take approximately 20 minutes.

- **Provide and manage all the logistics of data collection.**

The vendor will be responsible for the organization and for all costs related to the survey administration, oversight and quality control. This should include the provision of electronic devices, the printing of materials (maps, sample lists, code lists...), staff travel and accommodation costs, staff costs, data compilation, and quality checking.

- **Data quality checks and post-survey verifications.**

The vendor will be responsible for checking the data during and after collection. In cases of problem or inconsistency detected either by the vendor or by IWMI, the vendor will be responsible for

² A maximum of 450 reservoirs will need to be surveyed. The location and exact number of reservoirs will be shared with the vendor after the completion of remote sensing analysis by IWMI scientists.

contacting the respondents again and clarifying/correcting the data for transmittal to IWMI. This applies equally to each of the survey instruments.

2.3 Outputs to be submitted.

- **Finalized translated questionnaires and programmed data collection tools.**
- **Dataset in electronic format.**

4. DELIVERABLES UNDER THE ASSIGNMENT AND TIMELINE

The following items will be delivered by the vendor to IWMI according to the following schedule.

DELIVERABLES	DEADLINES
Activity 1	
Finalized questionnaires and programmed data collection tools (including translation in local languages)	30 Jun 2023
Transcripts and database from KIIs and FGDs (1 st half)	31 May 2023
Household lists from 80 villages	31 July 2023
Final and clean data sets from the community questionnaire	31 August 2023
Final and clean data sets from the household questionnaire	31 August 2023
Transcripts and database from KIIs and FGDs (2 nd half)	31 October 2023
Activity 2	
Finalized questionnaires and programmed data collection tools (including translation in local languages)	15 September 2023
Final and clean data sets from the reservoir survey	31 October 2023

The final timeline will be agreed upon between the vendor and IWMI provided that the completion of all the tasks and the delivery of all the outputs will occur by 30 November 2023. The vendor shall design a timeline to implement the tasks and deliver the outputs consistent with these indicative deadlines.

5. REQUIRED QUALIFICATIONS AND HUMAN RESSOURCES

- **Research vendor organization**

IWMI is looking for a vendor with previous experience with household data collection in rural areas of northern Ghana. The vendor will ideally already have conducted surveys that are similar in context and will have an established team of field enumerators or should be able to hire enumerators with requested skills. The vendor should, in addition, be a recognized organization established in Ghana with a good understanding of the stakeholders involved in aquaculture and fisheries.

- **Research Assistant**

To deliver the above-mentioned tasks, we suggest the vendor appoints a Research Assistant (RA) dedicated to this project. The RA should have experience programming survey questionnaires using a

data collection software and should be familiar with both quantitative as well as qualitative data collection techniques. The RA should be able to fluently communicate and coordinate with different stakeholders.

- **Research Coordinator**

The vendor will nominate one part-time coordinator to interact with IWMI and to lead the work from the vendor's side.

- **Enumerators**

Enumerators will be hired for the household survey and for the reservoir survey as needed.

6. EVALUATION OF VENDOR PROPOSAL

In order to assist IWMI in justifying the selection of the vendor best suited to the requirements of this project, please provide the following information as part of your proposal.

Technical proposal

- Description of the vendor's **relevant experience**, including:
 - Qualifications and experience of key staff to be assigned to this assignment. *Three pages or less.*
 - Details of previous projects executed with values and relevant references. *Two pages or less.*
 - Contact information for three current or former clients who have consented to be contacted by IWMI to share information about the vendor's performance
- **Technical narrative** showing the vendor's specific understanding of each of the two activities listed in the Terms of References and that describes the vendor's proposed approach, strategy and use of best practices for that stage. *Three pages or less.*
- A description, from the vendor's perspective, of the most important **risks**, obstacles or impediments to be expected in undertaking this assignment, along with the vendor's approach to **managing risks and ethics** and to ensuring successful implementation of the entire assignment. *Two pages or less.*

Financial proposal

- The proposed budget with all-inclusive price in US dollar for the performance and transmittal of all deliverables as described in the Terms of references
- A budget narrative which describes the details and assumptions of the budget.