

**Terms of Reference**

**Design of One Piped Water Scheme in each of Bugiri, Butaleja and Kaabong Districts (including completion of project brief/ESIA according to the NEMA Act)**

**General Description of the Country Programme**

GOAL is an Irish international humanitarian organization currently working in 15 countries in emergency and development contexts across the world. First operational in Uganda in the late 70’s, GOAL Uganda’s country programme is focused on long term development in health and livelihoods with a strategic focus on the north and east, where socio economic growth lags significantly behind the rest of the country. We have a coherent and innovative country programme that uses a resilience and systems approach throughout to increase incomes, employment, food security and diversity, increase social capital and improve health. GOAL works on a district focused approach and uses a mixture of direct implementation and partnerships with local civil society organizations, private sector partners and District Local Governments to give effect to our mission.

**Overview of GOAL Uganda WASH Programme**

GOAL has been implementing WASH programs in Uganda since 2003 transitioning from an emergency approach, through crisis recovery to a development WASH program, with an increasing focus on achieving sustainable impact using a systems approach. Geographically, GOAL Uganda’s WASH program has been implemented in Northern Uganda (Agago), Karamoja (Abim, Kaabong), and Eastern Uganda (Bugiri and Namayingo). In 2022, GOAL’s WASH program will include the Eastern district of Butaleja. GOAL works directly with communities and through partnerships and collaboration with civil society organizations, UWASNET, the private sector and in close coordination with local district governments (Bugiri, Namayingo, Butaleja and Kaabong Districts), regional government structures (Technical Support Units and Umbrella of Water and Sanitation) and the national government of Uganda.1 The WASH Programme directly contributes to ***Goal 2: People have Resilient Health*** of our country strategy, aligned with the GOAL Global Strategy. GOAL Uganda’s WASH programmatic approach among other thematic areas includes safe water supply through rehabilitation and construction of water points and piped water schemes. We continue to explore other contextualized WASH technological options suitable to reach even those living in hard-to-reach areas.

 In 2022-24, GOAL will continue construction of water supply points in rural areas of our districts of operation. Our work in water supply focusses on new boreholes drilling, boreholes rehabilitation, mini piped water schemes (or community tap stands) and medium sized piped water schemes. After completion of our water projects, these are handed over to the individual district and the responsible Umbrella Authority of water and sanitation for management. All our piped water schemes will be handed over to the umbrella authority of water and sanitation for post construction management in line with government policy.

 **Overview of the consultancy services**

GOAL has proposed the construction of three piped water schemes, each in Bugiri, Butaleja and Kaabong Districts, in line with the NDP (National Development Plan) III and the Ministry of Water and Environment strategic direction to increase the service coverage in the rural-urban areas and enhance public health. This call for reputable consultants to complete one design consultancy in any of the identified locations. The consultant can provide a quote for design consultancy for one location only or provide a quote for design consultancy in each location (all three locations separately). Each location must have a separate quote for each of comparison.

Rural-urban centres have been affected by rural-urban migration, and together with the population growth rate, this has caused gaps in the supply of safe water using point water sources (deep boreholes). These are prone to ground water contamination from the onsite sanitation Technologies dominantly in use. The high population growth rate has also led to long queues at point water sources, which denies many from timely accessing safe water. To enhance equitable access to safe and clean water for such communities, GOAL shall drill one production well in each target location with a safe discharge yield of between 15 - 50m3/hr that shall be motorized to supply the rural-urban population typically, of 8,000 to 30,000 persons during the ultimate design year. GOAL will be looking at serving a lower (existing) population at commissioning of the PWS. The consultant shall determine the population that shall be served by each well during the ultimate year and use the same for design consideration. From the overall designed project, the consultant shall recommend how the project shall be implemented, especially if phased construction is inevitable, in case the available budget is inadequate to finance the whole project. The location of sources will be determined by assessed need and hydrogeological survey in Bugiri, Butaleja and Kaabong districts, and will aim to serve the target community (ies) within a radius between 2-10 km from the production well or reservoir.

The target areas have limited connectivity to the national grid, and therefore GOAL anticipates that the water supply system shall be solar powered. Where power supply can be obtained from the grid, this will be the power source of choice and or, a hybrid. We therefore expect that a competent consultant will be familiar with both power supply approaches and their detailed design.

For design approval, it is mandatory that an O&M model for sustained use of the scheme be presented as part of the documents before the design review committee of Ministry of Water and Environment (MWE (Ministry of Water and Environment)) or any such organization mandated by the government of Uganda to offer such approval. Ultimately, GOAL Uganda will hand over the scheme to the MWE Umbrella Authority to operate and manage it in line with their management model (this model can easily be accessed from the MWE). To augment collection of water user fees, GOAL Uganda may install prepaid meters (PPMs) at water draw off points (the water kiosks and tap stands). PPMs are set to dispense a specific quantity of water at a rate already preset in the system. The system uses tokens preloaded with virtual water time (created within the system) and will only dispense water equivalent to the amount of money deducted from the token. The consultant should be able to consult relevant literature related to the PPM technology. For this consultancy, it is therefore also desirable that the successful consultant understands the MWE Umbrella Authority's management model.

Through this consultancy, we are also seeking to prepare a project brief for the construction of the designed Piped-Water Scheme (PWS).

The consultant will be conversant with the contents of the National Environment Act 5 – 2019 supplement 2. Part X – Environmental and Social Impact Assessments and Schedule 4 part 1(4). Any special conditions that the consultant may find which makes this project inconsistent with the quoted item in the policy will be deemed to have been included by the consultant in obtaining their final rate for this consultancy.

The ESIA/project brief shall be done after the completion of the detailed engineering design of the each PWS

The project brief should investigate any potential and foreseeable environmental and social impacts (positive and negative) of the proposed construction. The consultant will ensure that they submit documents in the required format to GOAL and to NEMA or any statutory body that may be required to be served according to this Act. The consultant will be conversant with the objectives of such an assignment and its outputs as these are specified in the National Environment Management Acts and its revisions and should include these in their detailed TOR (term of reference) methodology to demonstrate understanding of the required task and outputs.

GOAL intends to use these design consultancies and the following construction projects to facilitate its in-house engineers with professional registration with the Uganda Institution of Professional Engineers and the Engineers Registration Board (ERB). The current registration status of the in-house Engineers are Graduate Membership and Members of UIPE (GUIPE, MUIPE) and have done several Continuous Professional Development (CPDs) trainings with UIPE. It is a requirement of this consultancy that the consultant supports and ensures that our staff complete the requirements for registration. Specifically, each consultancy shall be used to

* Complete the registration of one engineer through UIPE corporate and ERB
* Complete the pupillage for at least 1 engineer.

The consultant will ensure that they allow for supervisory roles among their personnel for these additional outputs in their structure as it is proposed that GOAL staff selected for ERB registration shall use this project as part of their technical report and interview. The consultant will include a fee as part of their quotation, to facilitate this professional output.

**Objectives of this consultancy**

The consultant will work with GOAL Uganda’s WASH Coordinator and WASH Advisor Special Projects to conduct a detailed design of the piped water scheme at each location and provide the client with an approved design report, by the design review committee of Ministry of Water and Environment (MWE) or any such organization mandated by the Government of Uganda to offer such approval. The design report must pay attention to technical design requirements conforming to the minimum design requirements/codes as stipulated by MWE in the water supply design manual.

At completion of the engineering design above, the consultant will also complete the project brief in line with the requirements of the NEMA Act for each design, detailing the environmental impacts of the proposed project scope.

GOAL has an internal design review process involving the entire Programme engineering team who will directly work with the design consultant. The consultant’s design will also be vetted internally by the GOAL global WASH advisor and the funder (charity: water) who may also desire that the designs and final write ups be vetted by an independent consultant of their choice. The consultant for this project must be aware of these internal requirements and must be willing to conform with the rigorous checks required. As is necessary for a project of this nature, GOAL has an interest in both engineering design as well as the demonstration of economy for the final design outputs.

The design reviews will be conducted (online or physically) jointly between the successful consultant, the Umbrella of Water and Sanitation, the respective Technical Support Unit and the District Water Officer. The consultant must be aware of this requirement and should make necessary allowances for both time and resources.

GOAL is pursuing professional registration of its staff and this consultancy will cover professional registration of at least one engineer with UIPE and ERB and ongoing pupillage of at least one engineer.

 **Key deliverables**

The consultant will be expected to provide the following key deliverables for each design:

1. Complete a detailed socio-economic survey of the communities in the project area.

The goal of this consultancy is to have an approved design of a piped water scheme to supply safe water to the selected water stressed rural-urban communities during the ultimate design year. The consultant will include considerations for subsequent expansion where necessary in a phased or modular manner. The socio-economic survey is required in the target communities to assess acceptance, use and capacity to maintain the proposed water supply system. Other issues will be related to technology, household characteristics and general living conditions, among others.

1. Complete an assessment of the water demand of the targeted communities considering the future projections and service levels. The consultant shall be required to complete the assessment of all communities that will be taken care of during the ultimate design year.
2. Carry out detailed engineering and topographical surveys and produce a topographic map of the project area showing the population settlements, existing institutions, population centers and water facilities among others as may be required for the completion of the design assignment. Use the topographical map to locate suitable areas for the water supply reservoir for gravity flow, tap stands locations as well as institutional supplies. As may be necessary, provide locations for yard taps. The consultant will ensure that the engineering designs take into consideration future expansions and advise on this possibility in this design.
3. Complete the sizing of the PV power system and its mounting structures: Using provided drilling and test pumping reports and establishing the safe discharge of the borehole, use this information to complete the design of pumping system, sizing and quantifying the PV power system for the water supply system. Also complete the sizing of the PV mounting structures in line with economic and other arrangements within GOAL. Because of the possibility of future expansion of the scheme, the consultant should include this consideration in the power system design and advise on the expansions that can be economically completed during the life of the project.
4. Complete the sizing of the reservoir, the transmission and distribution networks using Epanet or similar software used for networks simulation. To note that the future populations served should be taken into consideration and therefore reservoir, pipe sizes should be able to be expandable in a phased manner.
5. Complete the sizing of the reservoir components, and panels and their sizing and structural analysis.
6. Complete the geotechnical investigation and foundations design for the reservoir.

The design consultant or a qualified geo-technical investigations consultant will investigate the soil conditions at the proposed reservoir site to determine the most economical bearing depth and foundation type to carry the reservoir loads. The consultant will be required to carry out detailed soil tests in situ and in the laboratory. This information shall be used to determine suitable foundations for the reservoir.

This item will require the determination of the bearing capacity of the soil at the proposed reservoir site using engineering procedure. This information will feed into the production of foundation designs for the reservoir. The following will be conducted; Detailed onsite and off-site soil investigations: scope of the soil investigations outlining the nature of soil sampling, on site tests required and the relevant code (s) of practice. Auger boring shall be carried out for the Standard Penetration Test (SPT) to BS 1377 at every 1.5m depth not exceeding 10m or until a competent stratum is reached. The Auger drilled borehole log shall be prepared in A4 size plan with full description of the geological strata.

1. Produce detailed drawings for all the civil works, electrical/power supply works, reservoir works, transmission and distribution lines, tap stands, sanitation facilities including all drawing details as required. All drawings approved by a competent professional.
2. Complete the financial and sustainability analysis of the overall designed project.
3. Produce detailed tender documents (Technical Specifications of the different components of the project, Priced bill of Quantities, Detailed Drawings) for bidding processes. The bills of quantities shall consider the phased implementation of construction, as applicable, discussed and agreed by GOAL.
4. The consultant shall recommend a phased construction schedule in agreement with GOAL and shall propose how future expansions will be implemented and how they fit in to the initial construction.
5. Prepare a project brief detailing the environmental impacts of the proposed project for each design and seek any approvals from the National Environment Management Authority (NEMA) or any such organization mandated by the government of Uganda to offer such approval. Details of the project brief in Annex 2.
6. Avail GOAL with two copies (both soft and bounded hard) of a final report which should include socio economic analysis, detailed engineering design and report approved by the design review committee of ministry of water and environment. Besides the details of the final report content are in Annex 1, the consultant will ensure that they tackle any foreseeable considerations required for the modular system design and construction to be undertaken and include this in the report. Any considerations required for the approval of the designs but not mentioned here would be included in the report.
7. Provide mentorship and training/pupillage to at least 1 Engineer working with GOAL and ensure the registration of at least one engineer working with GOAL.

**Methodology**

GOAL envisions that both desk, field-based and test analysis work will be required to complete this task. A mixed-methods, participatory approach and experimental methods will be employed. GOAL Uganda will avail the consultant with all information relating to the borehole hydrogeological investigation for the proposed source as well as the water-quality test results for review. The deductions made from the information provided will form part of the design report. The consultant is expected to propose his/her own methodology and implementation plan to undertake the assignment.

GOAL will hold an inception meeting with the successful bidder to have a harmonized understanding of the assignment and avail the consultant with any information at its disposal. The consultant is expected to make presentation of his/her approaches and implementation plan to GOAL and the district engineering team.

**Period**

This assignment is expected to take no more than three months (90 Calendar days) for the consultant for each location/ District to complete from contract signing date.

**Remuneration (Technical and financial offer)**

The consultant is expected to develop their own technical proposal and financial offer which should include professional fees, reimbursable fees if any, miscellaneous expenses, and all taxes (VAT (Value Added Tax), With Holding Tax) on professional fees. While completing the technical and financial proposal, the consultant is advised to provide detailed costs in respect to the major headings of the outputs. While GOAL will sign a lumpsum contract with the consultant, if the consultant does not complete all the tasks required to complete the design project, GOAL will only pay the value of the consultancy completed.

The consultant is advised to complete the pricing under the following major headings.

1. Preliminary
2. Social economic survey and water demand assessment/projections
3. Detailed engineering /topographic survey.
4. Geotechnical Investigations at the proposed reservoir site
5. Detailed Engineering design.
6. Production of tender documents (drawings, technical specifications and priced BoQ).
7. Financial and Sustainability Analysis.
8. Design report preparation and all Approvals.
9. Project brief preparation and all Approvals.
10. Professional registration with UIPE and ERB
11. Others (if any).

The key deliverables shall be routinely reviewed, discussed, and approved, as necessary. GOAL may terminate the consultancy if the consultant is deemed not measuring up with the minimum standards or produces substandard works at any time during the consultancy.

Your detailed TOR for the Environmental Project brief should include among others

* Your recommendation of the output of this consultancy based on your experience and knowledge of the NEMA Act or its revisions
* The objectives of the project brief/ESIA based on recommendations of the NEMA Act and its revisions.
* Detailed steps you will take to complete this assignment and requirements
* The outputs you will produce which will be provided to GOAL/NEMA or other statutory authority as may be required and
* The means of verification for the completion of those outputs.
* The timeline you will require to complete this consultancy

**Team composition**

A consultancy firm or individuals submitting a proposal for this project will be required to be familiar with the government of Uganda (MWE’s) design requirements/guidelines for water supply and the various design codes in use in Uganda. The successful consultant will also be familiar with the NEMA Act and have good knowledge and understanding of the minimum design requirements for approvals. You must have at least 5 years’ experience carrying out design of piped water projects in Uganda. You should also have a diverse team comprising of the following professionals, among others.

* **Team Leader**: The team leader shall head the design team and shall be a Civil Engineer with a minimum of five years of experience in design of water supply system/scheme powered by solar or hybrid (solar & national grid/generator), a minimum of a University Degree in Civil Engineering from a recognized Institution of higher learning. S/he shall be a registered engineer with Engineers Registration Board (ERB) of Uganda or its equivalent, and a member of Uganda Institution of Professional Engineers (UIPE) or its equivalent.
* **Structural/Civil Engineer:** The Structural/Civil Engineer shall have a minimum of two years of experiences in design and drawings of civil engineering works/foundation and steel/concrete structures. S/he shall have a minimum of a university degree in Civil Engineering from a recognized Institution of higher learning.
* **Electromechanical Engineer:** The Electromechanical Engineer shall have a minimum of two years of experience in design and drawings of electro-mechanical works. S/he should be knowledgeable in Solar PV modules designs and its accessories. S/he shall have a minimum of a Higher diploma in Electrical / Mechanical Engineering from a recognized institution of higher learning.
* **Engineering Surveyor:** The surveyor shall have a minimum of two years of experience in carrying out water/irrigation survey works and should be knowledge in GIS. S/he shall have a minimum of a University degree in Land Surveying from a recognized Institution of higher learning.
* **Sociologist:** The sociologist shall have a minimum of five years of experience in community/stakeholder engagement and management of stakeholder relationship in Civil Engineering projects like water/road works; socio-economic survey in communities and data collection, analysis and report writing. S/he shall have minimum of a university degree in social sciences/ developmental study/sociology from a recognized institution of higher learning.
* **Environment/ Natural resources scientist:** The Environmentalist shall have a minimum of five years' experience in carrying out EIA (Environmental Impact Assessment) assessments in Uganda, or its equivalent. S/he shall have a minimum of a university degree in Environmental sciences or Engineering and should be registered with NEMA
* **Quantity surveyor/Civil Engineer:** The Quantity Surveyor shall have a minimum of two years of experience in estimation and costing of civil engineering and construction works. S/he shall have a minimum of a university degree in Civil Engineering/Quantity Surveying/ Building Economics from a recognized Institution of higher learning.
* At least one of the professionals should be qualified to guide on registration with UIPE/ERB in the water supply sector

**GOAL’s Obligation**

GOAL will provide the following/perform the following functions:

* Borehole construction report to include drilling, test pumping and the water quality reports.
* Field support by the Field team of GOAL in Bugiri if necessary, especially during the field visit to the proposed project site.
* Introducing the consultant to key stakeholders like the MWE/TSU, District and sub-county officials and the beneficiaries (targeted communities).
* Organize a pre-site visit to a site that shall be identified in Bugiri, Butaleja or Kaabong, for the consultants before submitting their financial and technical proposals.
* Monitoring of progress and attending progress review meetings.
* Monetary reimbursement in line with the financial offer and attendant clauses.

**Annex 2: Key Project Deliverables Table – Checklist**

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| --- | --- | --- | --- |
| Detailed schedule of costs |   |   |  |
| Activity | **Required Output (s)** | **Evidence of Completion** | **Estimated Time**  |
| Site Visit | Field visit report/debrief | Out puts reviewed and agreed by GOAL technical team.  | Agreed workplan |
| Social Economic survey | Social Economic survey report  | Socio-economic survey process and final report agreed with GOAL MEAL coordinator | Agreed work plan |
| Topographic survey | Topographic survey report | Topographic survey conducted with instruments of required accuracy agreed with GOAL. Final report agreed with GOAL | Agreed work plan |
| Geotechnical investigations | Geotechnical investigations report | Geotechnical investigation equipment and procedure supervised and agreed by GOAL. Final report agreed by GOAL.  | Agreed work plan |
| Detailed Engineering design | Population projections | All computations and outputs agreed with GOAL | Agreed work plan |
| Computations for Water Demand and Projections |  |
| Reservoir sizing computations based on flow simulations  |  |
| Sizing of transmission and distribution networks based on *Epanet* simulations |  |
| Sizing of P-V power system or otherwise using agreed software |  |
| Structural design of the steel tower with details of all associated members |  |
| Design of other civil works; pump houses, P-V support structures, sanitation, water collection tap stands etc including detailing |  |
| Detailed tender documents | Priced BoQs, Technical specifications of works and materials, Schedule of drawings | Out puts reviewed and agreed by GOAL  | Agreed work plan |
| O & M model & Financial Analysis | Completed O&M model & Financial Analysis for sustainable Operation of the proposed scheme | Out puts reviewed and agreed by GOAL  | Agreed work plan |
| Mentorship and Training of at least two staff  | Completed provision of mentorship and training to at least two GOAL staff and registration with ERB for at least one staff. | Out puts reviewed and agreed by GOAL | Agreed Work plan |
| Complete design report | Approved copy of the final bound technical report | Out puts reviewed and agreed by GOAL  | Agreed work plan |
| Project brief | Approved copy of the report | Out puts reviewed and agreed by GOAL  | Agreed work plan |
| Others (to be provided by the consultant if any) |   | Reviewed and agreed by GOAL  | Agreed work plan |

**Annex 3: some of the methodologies that the consultant can review for application (if deemed relevant) to conduct socio economic survey**

1. Gather information and desk review of relevant published documents and literature related to household, socioeconomic, cultural and/or political characteristics in the target community.
2. Draft the socio-economic profile and key questions for interviews and survey including an identification of key respondents and contributors to the baseline study for key informative interviews and Focus group discussions. The choice of methodology though shall be that proposed by the consultant, reviewed, and assented to by both parties (Client and consultant). The tools to be used in the survey shall be reviewed and agreed to by the GOAL programme team before they can be applied in the community.
3. Conduct interviews, meetings, and survey on socio economic situation as well as community perception on the proposed water supply technology with regards to acceptance, ease of operation and maintenance, willingness to pay for water and or service, minimum amount they can pay per unit of water drawn, any community fears in having the project implemented and other additional data deemed useful at design and construction of the scheme. The interviews will be conducted with targeted communities, local, Sub-County and District authorities or any other stakeholder that the consultant shall qualify appropriate to achieve the overall goal of this consultancy.
4. Analyze data, formulate conclusions and recommendations to support sustained operation and maintenance of the proposed water supply project, support the engineering design process and plan the construction phase in a way that any probable disputes are minimized. The consultant shall therefore recommend the best Operation and maintenance model for sustained use of the scheme.
5. Prepare and consolidate all the socio-economic baseline profile for supported communities based on the result of this study, and other studies conducted by other organizations.
6. Constitute a team of experienced personnel to undertake this task.
7. Draft a report detailing the methodology and all the tools used, data analysis, conclusions and recommendations made based on the data harnessed from the exercise. This report shall form part of the deliverables in the broad design report of the piped water scheme.