

Consulting Terms of Reference

PROJECT: ASSESSMENT FOR SOLARIZING COMMUNITY WATER SUPPLY SYSTEMS

Expected duration: A maximum of 50 working days over 2.5 months

Place of work: North Mecha, North Achefer, Dera, South Achefer, Bahirdar Zuria & Fogera weredas of West Gojam and South Gonder Zones of Amhara Regional State

Start date: As soon as the contract is signed.

April 2023

1. BACKGROUND

The technology of choice for providing water supply to rural communities, even in new government and donor-funded projects currently under development, continues to be diesel-powered pumps, which carry with them significant problems including high fuel costs, the need to transport fuel, expensive maintenance, frequent breakdowns, and greenhouse gas emissions. At the same time, the price of solar panels has decreased dramatically over the last decade; today, solar is significantly cheaper than diesel, particularly for applications that require daily use. To ensure that communities can get reliable water at affordable costs, it is urgent to demonstrate to governments and donors that the technology of choice for rural community water supply should change from diesel to solar, both for retrofits and for new systems. While many people in the WASH field understand that solar should be the technology of choice, they may not be aware that a cost-effective business model exists for private developers to convert diesel community water pumps to solar without raising the community water tariff or needing to wait for a government subsidy or donation.

As part of Ethiopia's Nationally Determined Contribution to the UNFCCC, the Government of Ethiopia (GoE) intends to replace 10,000 existing diesel pumps with solar or wind pumping systems, and to develop 25,000 new solar or wind water supply schemes by 2030, benefiting seven million people and abating 0.2 million tons CO₂e per year. The GoE has begun this work with a \$50 million, five-year Green Climate Fund grant which will provide funds to purchase and donate solar powered water supply from 112 new wells. This model of donating equipment is unlikely to be scalable to cover the 35,000 pumps envisioned by the GoE. Recognizing this, the Ministry of Water and Energy (MoWE) is interested to pursue private sector investment and/or a blended finance model for scale-up.

The 10,000 existing diesel-powered community water supply systems in Ethiopia were provided as grants through federal and regional government programs. Communities collect a tariff – typically 1.6 US cents per 20-liter jerry can – to cover the cost of fuel, operation, and minor repairs. While this works well when the diesel engines are new, after 10 years of operation the maintenance costs become too large to be covered by the tariff, and systems suffer from increasingly frequent breakdowns. Repairs are delayed while communities collect money door-to-door from beneficiaries and from the local government office. When this happens, community members – mostly school age girls – must go back to walking up to two hours to collect water at the nearest river.

Winrock International has received funds from the Conrad N. Hilton Foundation to demonstrate and scale up the market for replacement of diesel community water pumps with solar pumps in Ethiopia. The project entails solarization of 10 diesel driven solar pumping systems in six weredas of Amhara regional state. The Weredas under this assignment include: North Mecha, North Achefer, Dera, South Achefer, Bahirdar Zuria & Fogera.

2. OBJECTIVE OF THE CONSULTING SERVICES

The project is seeking consulting services to assess the hydrogeology, water supply infrastructure, water quality, water demand, and risks to water resources in a total of 15-20 community diesel water pump sites. Data generated by the consultant will inform the selection of 10 priority sites for replacement of diesel pumps with solar pumps; therefore it is critical that the data is accurate and complete.

3. EXPECTED RESULTS

- Assessment of the water supply infrastructure, water supply capacity, and water quality at 15-20 community diesel pump sites, including:
 - Estimate the current and future (10 years) water demand in each community
 - Inspect the quality and capacity of reservoirs, elevated water tanks, water distribution lines, drive pipe (from the pump to the reservoir), public water taps, and diesel generator.
 - Yield capacity and static level of the borehole
 - Water quality testing results from an accredited body
 - Risks to water resources
- Recommendation of 10 priority sites for pump replacement

4. METHODOLOGY, TASKS, AND DELIVERABLES

Winrock seeks a consulting firm (Consultant) with the necessary technical specialties which can conduct the assessment in a total of 15-20 communities within a total of 40 working days. The Consultant must work closely with Winrock's Project Coordinator and coordinate with the community WASH committees (WASHCOs) in each site. The following steps are recommended for this assessment:

a. Introduction to the WASHCOs and community representatives in each site

Winrock will coordinate with the relevant wereda to introduce the Consultant and the scope and goals of this assessment to the WASH committees and community representatives, including women leaders, in each site.

Deliverable 1: Within one week of contract signing, submit a final methodology for this assignment, a timeline, and a proposed itinerary for visiting the community sites.

b. Informational meeting with WASHCOs and community representatives

The Consultant should conduct a meeting with the WASHCO and community representatives in each site to ask questions as needed, including questions about water demand and annotating a map of water system infrastructure.

c. Data collection and analysis at community sites

During data collection, especially examining the current status of water supply infrastructure and community water demand, the consultant should be accompanied by a WASHCO representative with detailed knowledge of the community water system. All field data should be entered into a spreadsheet which will be provided by Winrock.

Hydrogeology Analysis

At each site, the Consultant should determine:

- Head (height from water level in borehole to top of borehole, plus height from top of borehole to reservoir water inlet) (m)
- Dry season depth to water table (m) (when pump has not been run yet on that day)
- Pump discharge rate (litres/s)
- Dynamic recharge rate (from pump test) (hours)

For the pump test, to determine the dynamic recharge rate, the consultant must measure the depth to groundwater after the pump has not been operational for a minimum of 12 hours. Additionally, the consultant must remain in the community for sufficient time to assess the dynamic recharge rate, as the borehole may take some hours to refill.

Water Supply Infrastructure Assessment

Borehole and surrounding area

- Size of the borehole (diameter)
- Condition (functional, minor repairs needed, not usable)
- Suitability of surrounding conditions for solar array

Diesel Generator

- Altitude at diesel generator (m)
- Power rating
- Number of years in operation
- Condition (functional, minor repairs needed, not usable)
- Notes on condition of diesel generator

Drive Pipe:

- Length (m)
- Thickness (mm)
- Diameter (mm)
- Type (plastic, galvanized iron)
- Condition (functional, minor repairs needed, not usable)
- Notes on condition of drive pipe

Distribution pipe branches

- Indicate distribution branches on map and list by number
- Diameter (mm)
- Type (plastic, galvanized iron)
- Number of community taps
- Condition (functional, minor repairs needed, not usable)
- Notes on condition of pipe branches

Public water taps:

- Indicate public taps on map and list by number
- Number of taps at each location
- Number of people served per day
- Condition (functional, minor repairs needed, not usable)
- Notes on condition of public taps

Reservoir:

- Capacity (m³)
- How many times per day is the reservoir filled?
- What is the depth of water in the reservoir when it is filled during the dry season? (m)
- What is the depth of water in the reservoir during the rainy season? (m) (ask WASHCO)
- Condition (functional, minor repairs needed, not usable)
- Notes on reservoir condition

Water Supply System Component Sufficiency:

- Overloaded? (yes/no) (if yes, explain which component(s) are overloaded)

Other:

- Notes on any other relevant issue

Water Quality Analysis

- Conduct water quality testing in the field or by sending samples to a laboratory as needed.
- Water quality parameters must be based on Government of Ethiopia rules and regulations for drinking water.
- Laboratory analysis must be done by an accredited body in accordance with Government of Ethiopia rules and regulations; laboratory testing results must be certified. An example of an accredited laboratory is the Amhara Health Research Laboratory at Bahir Dar.

Deliverable 2: Completed spreadsheet detailing the current state of the water demand, hydrogeology, water supply infrastructure, and water quality in each of 15-20 community sites.

d. Meet with Winrock to discuss progress after 5 sites have been assessed

The Consultant should meet with the Project Coordinator after the first five sites have been assessed, to determine whether the spreadsheet is working and whether any changes need to be made.

e. Presentation of results

The consultant will present the semi-final assessment results to Winrock and will undertake one round of edits as requested by Winrock before submitting the final report. The consultant will present the final results at a validation workshop led by Winrock, which will include key local and regional government stakeholders. Once Deliverables 2, 3, and 4 are approved, a final invoice may be issued.

Deliverable 3: A Final Report of not more than 5 pages summarizing the assessment findings and making a recommendation of 10 sites where conditions are suitable for replacing the diesel community water pump with a solar pump.

Deliverable 4: A Powerpoint presentation to Winrock including not more than 10 slides summarizing the Final Report.

Deliverable 5: Presentation to stakeholders at the validation workshop led by Winrock.

Payment to consultant: This assignment will be paid in two payments: 20% after approval of Deliverable 1, and 80% after approval of Deliverables 2, 3, and 4.

Formatting of deliverables:

- Reports must be prepared and submitted as Microsoft Word documents
- All tables and data must be submitted to Winrock
- Presentations must be in Powerpoint, using Winrock’s slide template
- All data values must specify the units (e.g. depth in meters, etc.)
- All deliverables must be in English

5. REQUIRED QUALIFICATIONS

Winrock seeks a national consulting firm with experts whose qualifications are described below. The team should include at least one woman.

Lead Consultant

Diploma	Bachelor’s degree in hydraulic engineering or related field of study
General professional experience	<ul style="list-style-type: none"> • Minimum 10 years of experience with specialized training/certification on water supply systems, design, construction supervision and project management. • Minimum 4 years of experience in leading water supply projects or similar assignments • Minimum 5 years of experience in conducting similar studies • Demonstrated understanding and knowledge of water supply networks • Experience in Amhara region • Excellent English writing and document preparation skills

Technical Expert

Diploma	BSC degree in hydraulic engineering, water resource management or a related field
General professional experience	<ul style="list-style-type: none"> • Minimum 6 years of experience in water supply resource management • Minimum 4 specific experiences with similar assignments and complexity • Good English writing skills

6. OBLIGATIONS OF WINROCK

Winrock will cover the consultant's costs as agreed in the consulting budget. Winrock will make relevant project documents available to the consultant, as well as introducing the consultants to stakeholders to be contacted as part of the study.

7. BID CONTENT AND FORMAT REQUIREMENTS

The qualified Contractor is expected to submit a technical proposal and a financial proposal. The technical proposal shall contain a critical analysis of the ToRs, including a strategy for delivery

concerning methodology, cooperation, steering and work processes. The structure of the technical proposal must correspond to the structure of the ToRs.

CVs shall not exceed 4 pages. CVs must clearly show the position and job the proposed person held in the referenced project, and for how long. CVs shall also be submitted in English.

Please calculate your bid price using the Financial Proposal Template (**Appendix 4**). In the contract the contractor has no claim to fully exhaust the days/travel/workshops/ budgets. The number of days/travel/workshops and the budget amount shall be agreed in the contract as 'up to' amounts. The specifications for pricing are defined in the price schedule. As the contract to be concluded is a contract for works, please offer a fixed lump sum price that covers all applicable costs (fees, travel expenses etc.). The bid price will be evaluated based on the specified lump sum price. Please also provide the daily rate which the prices are based on. A breakdown of days is not required.

Bids must be in English, must use font size 11 or larger, and must be clearly formatted. Bid shall not exceed 8 pages, excluding CVs. **Bids must be submitted in PDF format by email to Gedion Hailemichael, Project Coordinator, Gedion.Hailemichael@winrock.org.**

8. BID EVALUATION CRITERIA

Contractors will be evaluated based on cumulative analysis through the following scenario:

- Responsive/compliant/acceptable, and
- Having received the highest score out of a pre-determined set of weighted technical and financial criteria (**Appendix 3**):
 - Technical Criteria weight is 70%
 - Financial Criteria weight is 30%
- Offerors with one or more women in the proposed study team will be favored by up to 5% in the composite score in the final selection.

Appendix 1: Anticipated Deliverables Schedule

Deliverable	Illustrative Due Date
Deliverable 1: Within one week of contract signing, submit a final methodology for this assignment, a timeline, and a proposed itinerary for visiting the community sites.	May 15
Deliverable 2: Completed spreadsheet detailing the current state of the water demand, hydrogeology, water supply infrastructure, and water quality in each of 15-20 community sites.	June 30
Deliverable 3: A Final Report of not more than 5 pages summarizing the assessment findings and making a recommendation of 10 sites where conditions are suitable for replacing the diesel community water pump with a solar pump.	June 30
Deliverable 4: A Powerpoint presentation to Winrock including not more than 10 slides summarizing the Final Report.	June 30
Deliverable 5: Presentation to stakeholders at the validation workshop led by Winrock.	July 15

Appendix 2: Analysis Parameters – World Health Organization

No.	PARAMETER	UNITS
1	Total Dissolved Solids/Electrical Conductivity	mg/l
2	Turbidity	NTU
3	pH	
4	Fluoride	mg/l
5	Arsenic	mg/l
6	Nitrate	mg/l
7	Nitrite	mg/l
8	Total fecal coliform	CFU/100mL
9	Cyanide	mg/l
10	E Coli	CFU/100 mL

Appendix 3: Bid Evaluation Criteria

Designation		Criteria	Maximum score
Qualifications of the contractor (45 points)		Years of general experience	5
		Experience with similar assignments, including water supply system inspection and hydrological surveys in Amhara Regional state, will be an asset (5 water pumping systems)	15
		Understanding of the ToR and proposed methodology for conducting the study	15
		Detailed workplan and timeline	10
Qualification of the consultant's key personnel (55 points)	Team Leader	BSc degree Hydraulics or equivalent field of study	5
		Years of experience in relevant sector	10
		Years of experience in design, implementation, or inspection of community water supply networks	10
		Years of experience leading water supply projects, or similar assignments	5
		Experience in the project implementation area	10
	Technical Expert	BSc in Hydraulic Engineering or similar field of studies	5
		Years of relevant experience	5
		Years of experience in similar studies	5
	Total (To be converted to 70%)		
Financial offer			30
Total			100

Appendix 4: Financial Proposal Template

Financial Proposal Template					
50 person-days total					
	Number of experts	Number of days	Total number	price per day (Birr)	Total amount (Birr)
Fee					
Team Leader	1	30	30		
Technical Expert	1	20	20		
Travel Costs					
Per diem	2	20	40		
Accommodation allowance	2	19	38		
Other travel costs					
Ground Transport	Number	Number of days		Price per day	Total Price
Vehicle rental	2	20	40		
Other reimbursable costs (Laboratory Testing)					
Other costs					
Total					