



Consultancy Announcement
Hydrological and Geophysical Surveyor for New Boreholes

Organization	Adeso: African Development Solutions, www.adesoafrica.org
Position Type	Short term consultancy
Consultancy Title	Hydrological and Geophysical Surveyor
Reporting To	Program Manager
Working Closely With	Program Team
Location	Badhan District, Sanaag Region
Duration	1 month
Starting Date	Immediately

ORGANIZATIONAL CONTEXT

Adeso is vibrant African-based development and humanitarian organization. At Adeso, we work with African communities who are yet to realize their full potential; working inside these communities to create environments in which Africans can thrive. Our belief that economic, social and environmental security is the bedrock of a healthy community drives the nature and intent of our programming. We work to prevent and overcome situations that adversely affect community well-being by: reinvigorating the economy, developing skills for life and work, providing humanitarian aid, and influencing policy.

For the past 30 years, we have strengthened rural livelihoods through environmental awareness, training, technology transfer and innovative humanitarian projects in pursuit of a peaceful, self-reliant, and greener future. Currently, Adeso has programs in Somalia along with global programs to decolonize and transform the humanitarian and development aid architecture. There must be practical solutions that support government and foundation to fund directly to local community-based organizations, and Adeso is being a part of the solution.

CONSULTANCY OPPORTUNITY SUMMARY

Adeso is trying to find a more sustainable approach to water security by procuring its own drill rig which will allow our independent action in drilling and piping water directly to health facilities and households in Somalia. Our pilot project will be in Badhan District of Sanaag Region.

Two sites in Badhan District will be chosen through **hydrological** and **geophysical surveys**. The consultant will use suitable techniques to find the best location for the borehole drilling,

including surveying communities to collectively choose the sites. The consultant will carry-out the geophysical survey using maps (topographic, geological), satellite images, aerial photos, field observations (geological mapping, vegetation surveys, etc.), desk studies (literature, field reports, etc.). Further methods include resistivity (vertical electrical profiling), natural-source self-potential and electromagnetic methods (such as VLF), magnetic methods, and micro-gravity surveying. Upon completion of the assessment the consultant will share the final report for potential groundwater for boreholes to be drilled thereafter.

SPECIFIC SCOPE OF WORK AND RESPONSIBILITIES

The primary Scope of Work for this consultancy is to conduct a hydrological and a geophysical survey of underground water in the targeted locations of Sanaag and identify the most suitable location for drilling of the two new boreholes in terms of getting sufficient amount of water with acceptable quality.

The Consultant is expected to use both secondary and primary data in the exercise, secondary data will involve desk study of available information/data on existing boreholes, drill logs, reports and maps while primary data will be obtained by carrying out hydro-geophysical measurements within the study area using the necessary hydro-geological surveying equipment, the new ABEM Terameter SAS 1000 or equivalent instrument, which distinguishes between clays and fresh water by resistivity profiling. Possible use of seismic refraction method is recommended for this assignment.

The hydrogeological/geophysical investigations will be carried out in a multistep approach:

- a. Desk study: Review of existing data, topographical maps, satellite images, existing studies and borehole site investigations in the area, geological reports and maps (if available), borehole and surface water records, etc.
 - Review of existing documents with information about the hydro-geological conditions in the area (e.g. information about boreholes and dug wells in the area, topographical maps, etc.),
 - Review of existing data, topographical maps, satellite images, existing studies and borehole site investigations in the area, geological reports and maps (if available), borehole and surface water records.
- b. Hydrogeological fieldwork: Detailed reconnaissance survey of project area. (GPS coordinates/P codes, water level measurements, condition of these boreholes, usage and performance where applicable) inspection of geological, geomorphological and structural characteristics of the investigated area; verification of existing data and findings.
 - Review of the knowledge that people have with regard to the hydro-geological conditions in the area.
- c. Geophysical measurements: vertical electric sounding resistivity profiling and seismic refraction application to confirm the VES interpretation.

- d. Analysis of hydrogeological/geophysical data.
- e. Compilation, analysis and evaluation of the gathered data and information.
- f. Site selection and reporting.

The outcome of the consultancy will be a detailed hydrogeological survey report giving details of the findings and recommendations.

EXPECTED DELIVERABLES:

The consultant is expected to deliver:

1. An inception methodology, detailing the secondary and field assessments phases, responding or adapting the present Terms of Reference to the initial findings and available data.
2. A brief note with the recommended sites selected for the geophysical survey in Sanaag, for Adeso's validation before the field deployment, with technical and social justifications (feasibility of water access provision for local populations).
3. A final report, with details listed below:

The final report to be submitted to will be a comprehensive account of the whole of the consultancy; it will review the existing literature and other relevant information, such as drilling logs, satellite images, etc. The report shall include all field data, interpretations and justifications, hydrogeological evaluations, conclusions and recommendations relating to the investigated areas. In addition, appropriate maps, diagrams and data plots shall be presented. Of considerable importance will be an objective assessment of the applicability and success of the methods to be applied.

Outlined below is what the Final Report should consist of:

- a. Introduction, review of previous studies and environmental background
- b. Geology and hydrogeology (incl. Inventory of boreholes and other water points)
- c. Methods of investigations, including Geophysical Techniques
- d. Detailed resistivity survey (Wenner & VES) and seismic refraction to delineate the productive aquifer
- e. Aquifer potential; sustainable yield & Water quality
- f. Proposed drilling site
- g. Proposed drilling method, and its applicability
- h. Environmental Impact and Protection
- i. Conclusion and Recommendations

Recommendations will be given on the most suitable site for borehole drilling, the required depth, water quality, design and installation details, and other relevant aspects. Based on the

available hydrogeological and geophysical data, an assessment of the anticipated chances of success shall be made for each individual site.

The hydrogeological report will give a detailed map delineating the investigated area, geology, aquifer properties (where known), location of measurements, and recommended drilling site. In addition, pictures taken during the actual field activity shall be included in the report. All geophysical data, including its interpretation will be produced as an appendix to the final report.

ESSENTIAL SKILLS AND QUALIFICATIONS

Adeso seeks to invite qualified consultants/firms who meet the following requirements to submit a detailed narrative and financial proposal on how to undertake the assignment.

1. Should be a consultant with operational establishments within Somalia or able to access the area of operation.
2. Proven technical and field experience of Lead/proposed Consultant with Master's degree in geology, hydrology, engineering geology, physical, or earth science, or in any related field and having good experience of working in this sector.
3. At least 3 past performed works similar to solicited work with proof of reference or completion letters/contract/ for each hydrogeological survey consultancy.

APPLICATION PROCESS

This is a challenging opportunity for a dedicated and highly motivated professional. If qualified and interested, please submit your application by **21st July, 2022** to consultancy@adesoafrika.org quoting "**Hydrological and Geophysical Surveyor**" as the email subject matter.

Each application should be addressed to Human Resources Department and include the following:

- Technical proposal on how the assignment will be conducted including methodologies, data analyses and interpretation, reports and schedules (List software to be used for analysis).
- CV including detailed work experience, education/degrees, details of similar assignments, and three professional references with complete contact information.
- Proof of availability of all the equipment, personnel and ability to mobilize them on short notice (Include list of equipment and CVs of the personnel) to perform the survey.
- Workplan, detailing week by week what will be completed.
- A detailed financial proposal including all professional fees, travel, security, insurance, accommodation & transport, reporting costs and subsistence costs. Please note all costs must be broken down into details (no lump sums, no contingencies etc.)

The consultant will be responsible for their own security and health insurance while in Sanaag and Adeso will not be responsible for any injuries or damages incurred during the assignment. The costs submitted must be inclusive of all anticipated expenses.

Applications not including all of the above information will not be reviewed. Only short-listed candidates will be contacted. Adeso is an equal opportunity employer.