

Terms of Reference

**Engineering Services for Technical Assessment of the Water Supply
Infrastructures & Systems in the Cabo Delgado Province, Republic
of Mozambique**

For

**United Nations Office for Project Services
Kenya Multi-Country Office
Northern Crisis Recovery Project**

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Key Information

Type of Infrastructure to be assessed:

- Water Supply and distribution Infrastructure / Systems

Type of the Service:

- Carry out Technical Assessment of the current status of the water supply infrastructures (WSI) by collecting factual data from the sites.
- Prepare draft and detailed assessment report.
- Prepare a schematic drawing of the WSI systems/network Prepare a high level.
- Prepare a high level outline of SoW and high level cost estimate for the rehabilitation or construction of new water supply infrastructure systems, for the associated facilities & systems.
- Attend to UNOPS comments on assessment reports, and revise the assessment report and associated documents listed in the above.
- Prepare final assessment reports complete with recommendations/proposals for the rehabilitation and or new construction works. The recommendation shall include identifying and listing Site Investigations required as input for design development activities.

1. Introduction

UNOPS mission is to expand the capacity of the UN system and its partners to implement peace building, humanitarian and development operations that matter for people in need. Working in some of the world's most challenging environments, our vision is to always satisfy partners with management services that meet world-class standards of quality, speed and cost effectiveness.

UNOPS provides services in sustainable infrastructure, sustainable procurement and sustainable project management, with projects ranging from building schools, roads, bridges and hospitals to procuring goods and services and training local personnel.

By assisting UN organizations, international financial institutions, governments and other development partners, UNOPS makes significant, tangible contributions to results on the ground.

UNOPS is engaged to provide overall technical and project implementation support to the Ministry of Finance, Government of the Republic of Mozambique, on the implementation of the Northern Crisis Recovery Project (NCRP). The project is designed with 3 distinct delivery components as follows:

Component 1 - Building social cohesion and resilience to conflict;

Component 2 - Provision of livelihoods and economic opportunities for IDPs and host communities;

Component 3 - Rehabilitation, construction and equipment of public infrastructure; and

Component 4 - Project implementation, monitoring and evaluation.

UNOPS is therefore procuring the services of a consultant to carry out detailed technical assessment and design, to improve the **Water Supply infrastructures and Systems** (WSS, an activity under component 3) in the Cabo Delgado Province, in the recently liberated districts of Mocimboa da Praia, Palma, Muidumbe, Macomia, and Quissanga. The assessment and design is to be undertaken in line with this Terms of Reference for the sites listed in Table 1. Location of Sites for Assessment of Water Supply Infrastructure Systems.

2. Background

Since October 2017, the Province of Cabo Delgado has been experiencing an armed insurgency that has taken a heavy toll on lives and livelihoods and has resulted in a displacement and humanitarian crisis. Insurgents have focused attacks on state targets, including public administration buildings, as well as on key infrastructure, businesses, and homes. The districts in Cabo Delgado that have been most impacted are Mocimboa da Praia, Palma, Muidumbe, Nangade, Macomia, Quissanga, Ibo, Meluco, and Mueda.

In addition to the large-scale displacement of people, the attacks have resulted in considerable physical damage to buildings and basic services infrastructure and have disrupted livelihoods and economic activity. As of September 2021, more than 220 schools and multiple water systems in the province have been impacted, and more than 130 health units closed or destroyed. More than 300,000 school-age children have been displaced and rely on emergency schooling. The public administration officials have also fled, causing a lack of regular government service in the nine districts, as most of the local public administration officials in those districts have relocated to more secure districts, including Pemba & Metuge. A field assessment of the five liberated districts, conducted by the Government of Mozambique, in August and September 2021, found that a significant

number of the public buildings and infrastructures in the most affected districts have been severely damaged, destroyed, or structurally compromised to the point that repairs may not be cost-effective.

Since August 2021, the Government has regained control of the districts of Mocímboa da Praia, Quissanga, Palma, Muidumbe, and Macomia; which are five of the nine districts most affected by the conflict in Cabo Delgado. **The immediate restoration of the local public administration functions and the provision of basic services such as water supply, sanitation, electricity, healthcare, and education are critical for the quick return of people's lives to normality while medium-term interventions are gradually implemented. The re-establishment of water supply infrastructures will assist the population in resuming their social and economic activities.** The overall perceptions within the public and private sectors of the situation should improve countrywide.

The World Bank, together with a number of development partners, is supporting the development of a Recovery and Peace Building Assessment (RPBA) in support of the Government Integrated Development and Resilience Strategy for the North (ADIN).

As such the Government of Mozambique obtained funding from the World Bank for the implementation of the Northern Crisis Recovery Project (NCRP).

The development objective of the NCRP is to improve access to basic services and economic opportunities for internally displaced persons and host communities in targeted areas of Northern Mozambique.

3. List of locations for water supply infrastructure for assessment

The infrastructures to be assessed are located in Cabo Delgado Province, in Mozambique. A description of the project area (districts and admin posts) identified by the Government for assessment and design services is listed below [\[Google Earth Link for Project sites\]](#).

Table 1. Location of Sites for Assessment of Water Supply Infrastructure Systems

| Description | | | GPS coordinate | |
|-------------|-------------------|------------------------|----------------|-----------|
| Lots | District | Admin Post | Latitude | Longitude |
| Lot 01 | Palma | Palma Sede Old system | 10.777 | 40.47 |
| | | Palma Sede area 4 | 10.776 | 40.463 |
| | | Palma Sede area 5 | 10.777 | 40.469 |
| | | Mute | 10.996 | 40.342 |
| | | Palma sede Manguna | 10.810 | 40.411 |
| | | Quionga | 10.594 | 40.509 |
| | | Quirinde | 10.614 | 40.567 |
| Lot 02 | Mocimboa da Praia | Mocimboa da Praia sede | 11.344 | 40.356 |
| | | Diaca | 11.534 | 39.944 |
| | | Mbau | 11.628 | 40.176 |
| | Muidumbe | Base Ntchinga | 11.733 | 39.891 |
| Lot 03 | Quissanga | Bilibiza | 12.565 | 40.276 |
| | | Quissanga | 12.434 | 40.483 |
| Lot 04 | Muidumbe | Mengueleua | tbc | tbc |
| | Macomia | Chai | 11.931 | 40.107 |

Note: The exact GPS coordinates shall be verified and confirmed during the assessment.



4. Objective of the Consultancy Services

The overall objective of the engineering service is to carry out a detailed assessment of the public water supply infrastructure networks for locations identified by the Government (Refer to Table 1).

The components of water supply infrastructure systems to be considered for the assessment includes but not limited to the following:

- Water Supply and distribution Infrastructure, associated ancillary facilities and systems
 - Intake structure and location
 - Water Treatment Plant
 - Main aduction pipe (Rising Main)
 - Storage Reservoir/water tank
 - Boreholes, pumps and associated systemDistribution/reticulation network
 - Electric power system and ancillary facilities such as reservoirs, pumps and pumping stations
- Topography survey works
- Data on domestic and industrial water consumption rate and data on existing water reservoir capacity.

5. Scope of the Assignment

The scope of the assignment is to undertake an assessment of the existing water supply infrastructure by visiting the sites and collecting actual data from the sites, and to identify those water supply infrastructure components / systems that are damaged as a result of the conflict or are damaged due to other incidents such as due to lack of maintenance.

The Consultant shall carry out the assessment of the water supply infrastructure systems, ancillary facilities/sites based on the list provided by UNOPS and confirm the exact locations (GPS coordinates) in consultation with the pertinent government bodies.

The consultant is expected to complete the following tasks within the given timeframe:

- Develop a detailed assessment plan including the methodologies, tools, and approaches to be used for the assessment and design activities.
- Mobilize a team of qualified and experienced engineers and technicians to the field to collect the necessary data and measurements.

- Undertake detailed assessment of the status of the water infrastructure system, and associate ancillary facilities.
- Assess the boreholes, pumps, associated systems, and test the quality of water and flow rates.
- Conduct hydrostatic testing/investigation to detect leakage in the water supply system
- Undertake Environmental & Social Screening, in line with the [template](#).
- Prepare and submit to UNOPS, a detailed assessment report that includes:
 - the current functional condition, and extent of the damage of the infrastructure systems, components and ancillary facilities including the results of borehole yield test, hydrostatic testing and quality of water from the boreholes.
 - prioritization of the infrastructure works in terms of their degree of damage, and recommendation on the intervention approach, i.e. emergency repair,
 - For budgeting purposes, a high level of cost estimate for reconstruction or new construction of the assessed infrastructure and an outline of SoW for the works
 - Conclusion and Recommendations
- Prepare a schematic drawing of the WSS systems/network at high level.
- Prepare a high level outline of SoW and high level cost estimate for the rehabilitation of the water supply infrastructure systems, and associated ancillary facilities & systems.
- Submit a final assessment report in soft copies
 - Drawings in DWG and PDF format
 - Narrative reports,, cost estimates & BoQs, in Google doc and PDF format
 - Revise the assessment reports and associated documents as per the UNOPS review comments
 - Prepare final assessment reports that are complete with recommendations for the rehabilitation works. The consultant may also include in the recommendation a list of Site Investigations required as input for design development activities.

6. Methodology

6.1. Technical Assessment of the infrastructure Facilities

The consultant shall organize the resources required for the assessment and mobilize to the site (s) in line with the schedule of activities.. The consultant shall consult with the stakeholders that include, but are not limited to, the pertinent government officials, and community leaders to consider their inputs/concerns while carrying out the assessment. The consultant is required to visit the sites jointly with the representatives of the community and the pertinent government offices. UNOPS may visit sites with the consultant as is appropriate.

The Consultant shall assess the level of damage to each water supply infrastructure facility. The level of damage of each component of the facility and the expected performance potential of the facility shall be registered in a format to be agreed upon with UNOPS.

The assessed infrastructure shall be given a damage level rating and classified in terms of the recommended intervention measures that will be required to reinstate and make them functional to meet the requirements of the design standards and specifications of the government and the UNOPS design planning manuals. The consultant may have to conduct tests to identify and evaluate the level of damages to the infrastructure components.

Inputs from UNOPS

- [UNOPS Design Planning Manual for Buildings](#) (Technical framework for minimum requirements for infrastructure design)
- List of project sites as per Table 1: Location of Sites for Assessment of Water Supply Infrastructure Systems
- Standard guidelines from the National Directorate of Water (DNA) (Mozambique) (link: [Decreto N 30-2003 de 01 de Julho - Regulamento dos Sistemas Públicos de Distribuição de Água e de Drenagem de Águas Residuais](#))
- Guidelines - The World Bank's Environmental and Social Standards (ESS) are available (link: [ESS](#)).
- All drawings to be prepared in line with UNOPS "CAD Drawings Guidelines"
 - [CAD Drawing Guidelines](#)
 - [2023 01 21 LIST OF SUBMISSION DRAWINGS](#)
- Templates: [Environmental & Social Screening Form](#)

7. Expected Deliverables

The deliverables from the engineering services shall include but not limited to the following:

- **Assessment Report**
 - Raw data from sites (using tools/templates to be agreed with UNOPS)
 - Topographical report and associated drawings using Google doc, DWG, and PDF

- Detailed Site Assessment Report, with photos (at least 4 photos per issue/damage point or location or component assessed) and a summary of the findings inclusive recommended intervention measures.
- **Schematic drawing** of the WSI systems/network: As-built and schematic proposal for rehabilitation or new construction
- **Cost Estimate & SoW:** Bill of Quantities, specifications, and cost estimates for the rehabilitation or reconstruction of the water supply infrastructure systems, for the associated facilities & systems
- **Environmental & Social Screening Report**

Note: Final documents to be submitted in English and Portuguese languages both in Soft and hard copies.

- Soft copies: Assessment reports, data from site (soft copy format of in google doc, google spreadsheet, google slide for presentation, pdf and for drawings in PDF and DWG formats) and
- Hard copies (2 copies of each document/deliverable)

UNOPS will review each deliverable from the Consultant, and the consultant shall respond to the review comments within five (5) working days.

8. Team Composition and Qualification/skills required

The professionals required to deliver the service are the following, which the consultant is expected to indicate their daily rates in the cost breakdown analysis. The design professionals need to **have licenses to practice in Mozambique** through a government-recognized professional body.

| Professional | Minimum Education | Minimum Experience |
|--|---|--|
| Senior Project manager/Coordinator PART TIME | BSc in Civil / Mechanical Eng. | Eight years experience in civil /mechanical design of water works |
| Mechanical Engineer FULL TIME | BSc in Mechanical Engineering | Five years experience in mechanical design of water works |
| Electrical Engineer FULL TIME | BSc in Electrical Engineering | Five years of experience in the design of electrical systems of water works |
| Hydraulic Engineer FULL TIME | BSc in Civil/Hydraulics Engineering | Five years experience in the design of water supply distribution network |
| Civil Engineers FULL TIME | BSc in Civil Engineering | Five years Experience in structural works design/construction |
| Structural Engineer FULL TIME | BSc in Civil Engineering | Five years experience in structural design of water reservoirs and water tanks |
| Environmental /HSSE Specialist PART TIME | Certificate in HSE or Certificate in Environmental Science | Three years of experience in HSE and or Environmental Science |
| Architect PART TIME | BSc in Architecture | Three years of experience as an Architect |
| Surveyor topography FULL TIME | Diploma in Surveying | Five years of experienceTopographic Surveying |
| CAD Technicians FULL TIME | Certificate in in Civil/ Building/ Architectural Technology or Certificate in CAD | Three years of experience in CAD - Drafting |

9. Duration of Assignment and Schedule of Milestones

The Engineering services for site assessment of damaged water supply infrastructure shall be completed within sixty (60) calendar days from signing of the Assignment..

The expected milestones of the deliverables are as follows:

| # | Milestone | |
|---|---|---|
| 1 | Complete Site Assessment and submit raw data from field | 21 calendar days after signing the agreement |
| 2 | Submit DRAFT Assessment Report | 31 calendar days after signing the agreement |
| 3 | Complete and submit FINAL Assessment Report | 60 calendar days after signing the agreement |
| | TOTAL COMPLETION DAYS | 60 calendar days after signing the agreement |

- UNOPS shall review the draft assessment report within one week of receiving it from the consultant

10. Payment Milestones

While UNOPS and the consultant may agree upon a different schedule of the payment, the following is the preliminary schedule of the payment considered by UNOPS:

Payment Milestone 1 - Upon deployment of assessment team to the site

Payment milestone 2: Upon the completion of the draft assessment report and acceptance by UNOPS

Payment milestone 3: Upon the completion of the final assessment and acceptance acceptance by UNOPS