PORT SUDAN WATER SUPPLY STRATEGY REVIEW

Terms of Reference (Draft)

## Background

Port Sudan is located in eastern Sudan within the Red Sea coast. It’s surrounded by mountains and the Red sea. The climate is affected by the sea evaporation and mountains. There are many seasonal water streams running from the Baraka and Arbaat mountains to the Sea. Because these are the only fresh water sources, many dams and boreholes were constructed in the waterway and around the fields. For Port Sudan, historically many dams were constructed in Arbaat to supply the water. The dams were not sustainable due to the high amounts of sediments accumulated every year.

On 25 August 2024, the Arba’at Dam, located approximately 30 kilometers northwest of Port Sudan, collapsed following the flood due to heavy rains, leading to wash of all the vicinity structures and local villages. As Arbaat Dam and well fields are the primary sources of water for the coastal city of Port Sudan, the city and surrounding community has lost the only water source for domestic use and cultivation.

According to the emerging situation, the Government, UN, NGO’s , institutions and local organizations started to look for possible solutions in the immediate and long term. As UNOPS is one of the main partners working with the State Water on the water supply projects, it has engaged with many potential partners and donors to look for the solutions and provide support to the Government and community. For this, UNOPS is in preliminary discussions with Dutch Disaster Risk Reduction and Surge Support (RVO) as one of the international institutions providing support to the disasters worldwide.

## Objective

The objective is to develop a ToR for engaging expertise from RVO to support UNOPS with the implementation of the recommended strategies and solutions towards Sustainable Water Supply for Port Sudan and to look for the best ways to overcome the water scarcity in Port Sudan.

**The specific objectives of this ToR, are to engage specific technical experts from RVO who can support with the following activities:**

* Recommendations on water strategies based on previous studies and workshops conducted with State Water and Red Sea University
* Impacts of Floods and Risk assessment with recommendations on mitigations to be considered for long, mid and short term .

## Scope of Work

In close collaboration and coordination between UNOPS, RVO and State Water Corporation, the following activities needs to be carried out:

1. **Desk Review**

A comprehensive desk review is needed to assess, revise and validate existing studies and identify the knowledge gaps for the short, mid and long term for water availability in Port Sudan.

* Assess the quality and completion of existing studies conducted for Port Sudan water supply and Arbaat dam/aquifer, indicating the gaps to be filled for conducting a comprehensive study at Basin scale.
* Develop a document indicating the best proposed solutions included in the conducted studies.
1. **Studies and Technical Assessments**

Based on available data and previous studies, including satellite images and remote sensing the technical experts shall:

* Review studies, conduct workshops, carry out site visits to assess the sustainability of water supply for Port Sudan and surrounding communities
* Inspect and assess the current recent situation (with the absence of the dam) and the impact of dam failure on the water supply in short, mid and long term periods
* Inspect and assess the condition and capacity of existing small dams
* Impact of dam failure on aquifer recharge and existing boreholes based on previous studies
* Capacity of aquifer to cover part of the water demand and potential additional boreholes
* Asses the studies of the existing desalination plants and investigate the root cause of the failure to operate them
* Evaluate the integration of and capacity of the desalination plant water as main or secondary water source in responding to Port Sudan city needs compared to the Arba’at and River Nile Sources
* Analyze the Water Balance based on current and future scenarios
* Come up with recommendations on the aquifer and sustainability strategies (Utilization, Rationalization, monitoring, recharge)
1. **FAST TRACK RESPONSE**
* Identify the fast-track way/options to supply the city while looking for other alternatives in Arba’at region and other affected locations
1. **Support From RVO**
* Oversee the overall studies and prepare the plans for the work to be carried out
* Provide experts for managing, directing, supporting and guiding the studies
* Provide Experts for conducting workshop materials and discussion papers
* Support of studies using most advanced technology for remote sensing and modeling
* Provide Capacity Building for State Water staff in the areas where they can support/complement RVO.
* Prepare the final report which includes the stated deliverables and relevant technical documents

## Approach and Methodology

The study will be conducted by UNOPS with the technical support of RVO and in coordination with the State Water staff. The first stage will include investigations and review of the relevant documentation from the various investigations and studies that have been conducted up to date on the Red Sea Water supply.

The Consultant (RVO) will provide effective support for the search for a fast-track solution to respond to the immediate needs and to plan the long-term response. through modern technologies and expertise to do the modeling and investigations. The parties will ensure sharing of information and consistency of approaches, to avoid duplication of work. The Consultant is also expected to collaborate effectively with UNOPS and to forge a productive working partnership with State Water staff, to achieve the outcomes of this study.

A significant part of the information gathering will take place in the field. The State Water is expected to provide the necessary support during traveling, investigations and also to provide the required information on the existing situation and infrastructure, as well as previous studies and documentations that could be found within the State Water administrations and operations staff and management, and at local/state Government level. The field visits will also enable the teams to undertake inspections, formal and informal discussions with a sample of key stakeholders and with (existing and potential) beneficiaries. For the field phase of the assignment, the State Water and UNOPS staff will accompany the RVO experts and provide any additional technical support needed.

## Deliverables

The Consultant RVO is expected to produce the following documents:

* A critical review document showing general history and description of the water supply system, and of the different solutions proposed by previous studies to respond to the water demand in the area, with emphasis on gaps.
* A document on the knowledge gap to conduct future studies and interventions, including the mitigation measures
* The water balance matrix showing all existing, as well as potential water sources with their corresponding characteristics and expected life span and their contribution to increasing the water supply
* An output document on water supply scenarios in short, intermediate and long term solutions
* Any additional technical documents which may support UNOPS team during the Technical Assessment and with the preparation of detailed design package

## Suggested Preliminary Timeline

| No. | Duration | Subject |
| --- | --- | --- |
| 1 | 2 weeks | Planning – Following preliminary meetings and discussions, review and review of scope of work, prepare the MOU, agreement on approach and methodology to be used.  |
| 2 | 3 Weeks | Inception: Prepare the plans and assign roles & responsibilities, collect documents, review the documents. Conduct meetings and discussions or workshops if needed. Field visits to provide necessary information in collaboration with State Water and local government. Inception Report will present a detailed Work Plan for the proposed studies. |
| 3 | 4 weeks | Field Phase. Travel to site conduct meetings, discussions, undertake inspections, data collection and validation, conduct surveys and necessary investigations and measurements to enable the modeling of aquifers, catchments, climate, risk and data analysis. RVO experts might participate in person. Multiple trips may be necessary.  |
| 4 | 4 weeks | Studies: Modeling, Data Analysis, including mapping and hydraulic modeling. Preparation Draft Reports and necessary technical documents. |
| 5 | 1weeks  | Circulation of draft Report for review and receipt of comments. |
| 6 | 1 week | Finalize and incorporate feedback received. |