Strengthening Drought Resilience for Smallholder Farmers and Pastoralists in the IGAD Region (DRESSEA)

Terms of Reference

Assessment of surface water and groundwater

February 2023

Contents

1. Project Background

Drought is one of the major natural hazards affecting people's livelihoods and socio-economic development. In the Inter-Governmental Authority and Development (IGAD) region, smallholder farmers and pastoralists face the adverse effects of drought. According to IGAD 2030 , between 60- 70 percent of the land area in the IGAD region consists of Arid and Semi-Arid Lands (ASALs) that receive less than 600 mm of rainfall annually. It is predicted that the frequency and intensity of droughts would increase because of climate change, especially in Semi-Arid areas. From 2015 to date, high rainfall anomalies have been recorded. The region also faces uncontrolled activities such as deforestation and poor agricultural practices that lead to reduced water retention capacities, surface runoffs, and soil cover losses. These activities not only impact negatively on water resources, environment and other ecosystems that serve as community livelihood sources, but also increase peoples' vulnerability to droughts. The natural resources of the region represent a major asset for the local populations whose livelihoods rely mainly on agriculture, livestock, fishery, forest resources, pastures, etc. To strengthen the resilience of the region's populations and ecosystems to drought, the Sahara and Sahel Observatory (OSS) in collaboration with the Global Water Partnership Eastern Africa (GWPEA) and the four riparian countries (Djibouti, Kenya, Sudan, and Uganda) submitted a project to the Adaptation Fund (AF) entitled "Strengthening Drought Resilience for Small Holder Farmers and Pastoralists in the IGAD Region - DRESS EA". The project was approved by the Adaptation Fund Board in October 2019.

These Terms of Reference have been prepared with the aim to undertake the assessment of surface water and groundwater which is one of the activities of the project by a consultant.

2. Objective of the Project:

The overall objective of the project is to increase the resilience of smallholder farmers and pastoralists to climate change risks mainly those related to drought, through the establishment of appropriate early warning systems and implementation of drought adaptation actions in the IGAD region.

The specific objectives of the project are to:

- Develop and promote regional investments in drought early warning systems (EWS) and improving the existing ones

- Strengthen and improve the capacity of key stakeholders in drought risk management at regional, national and local levels

- Facilitate smallholder farmers and pastoralists with inputs to undertake innovative adaptation actions that reinforce their resilience to drought

- Enhance knowledge management and information sharing on drought resilience.

To achieve these specific objectives, the project is structured around four main components that were elaborated considering drought dimension from the regional, national and local contexts.

Component 1: Promoting Investments in Early Warning Systems (EWS)

With an ultimate objective to have efficient and effective EWS in place, this component focuses on establishment of institutional linkages to generate, share and disseminate as well as develop feedback mechanism to early warning information. In each member country, the project will identify investment areas in EWS, review existing drought management plans and create awareness and capacity building.

Component 2: Strengthening capacities of key stakeholders at regional, national and local levels

The component involves undertaking capacity building programs in drought risk management. Capacity gaps and priorities will be identified and supported. Also, the project will identify key capacity building tools at national and regional levels, including innovative drought adaptation actions and strengthen capacities of key stakeholders at regional, Terms of Reference-GWPEA-ICPAC DRESSEA Project 3 national and local levels. Approaches to integrating drought risk management interventions into existing development plans will be supported.

Component 3: Supporting innovative drought adaptation actions Concrete and innovative drought adaptation actions will be identified and supported for adoption by stakeholders.

A scale-up strategy will be developed and replicated. The concrete adaptation actions will focus on the innovative scalable aspects. These include: modified rainwater harvesting structures and water storage systems e.g., simplified water jars, rock water harvesting techniques; construction of sunken sand dams, water ponds and mini-irrigation systems to support crops during water stress as well as restoration of degraded water catchments. Other adaptation actions include: supporting innovations in the groundwater management structures, e.g., the construction of boreholes and water wells and roadside water harvesting. The project will promote the installation of solar pumps and alternative energy sources e.g., solar and energy-saving stoves. Innovations to be promoted in energy-saving space are interlocking blocks, and charcoal brickets- manufactured from household waste. There will be improved water and soil conservation techniques to enhance food security. Other adaptation actions include pasture management, which will involve growing fast-growing pasture varieties and their storage as silage or hay for longer-term use by domestic animals, supporting improved livestock breeds (cattle and goats), and growing drought-resistant crops.

Component 4: Knowledge management and information sharing

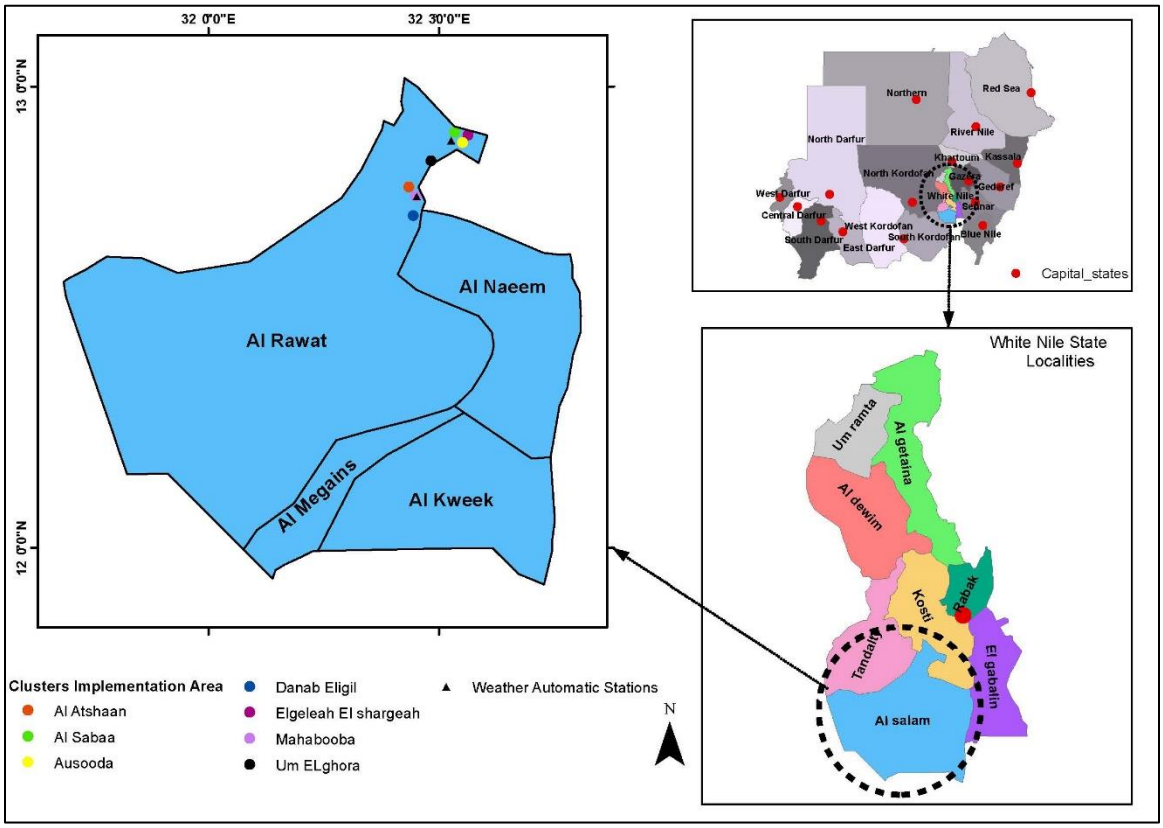
This component is dedicated to awareness-raising, communication, and capacity building, including knowledge generation and dissemination. This will be achieved by generating knowledge on drought risk management and sharing it through both electronic and print media. The project will document, compile and package good practices, for the benefit of different targeted groups (farmers, pastoralists, and others) and focus on the major challenges facing the project area to turn them into opportunities. Besides, a communication and awareness-raising action plan will be elaborated to serve as a decision-support tool for the stakeholders and concerned authorities. The DRESSEA project is transboundary, multi-sectoral, and multi-disciplinary in nature and implementation will be conducted in a consultative, participatory, and integrated manner, and will encompass community, national, and regional levels.

3. Project Area:

The Total land surface area of Al Salam Locality is around 8,600 km2. Its topography is flat. Its soil is dominantly back cotton soil clay with some sandy ridges (Goz). The sandy soil is more in the north and decreases towards the south. The rainfall, the vegetation cover and the forests land all

decreases from south to north and accordingly the level of vulnerability increases from South to north. The Locality has rich natural resources of irrigation schemes on its eastern side, mechanized rain-fed schemes on its western side and traditional rain-fed farming, livestock and forests.

The execution area of the project is in Al Salam locality in the White Nile State as shown in figure (1) seven cluster villages were chosen as the project site as shown in table (1)



Figure(1): Execution Area

Table 1: Selected Sites for DRESSEA Project Implementation (Baseline Study Report, June 2022)

Rank	Name of Village Cluster	Villages in the Cluster	Location	Population	
			UTM USGS 1984 Zone 36P	Number of households	Population

			East (m)	North (m)		
1	Um ELghora	Um ELghora	443,908	1,419,441	349	2094
2	Assabaa	Ashawrab	450,213	1,426,672	123	738
		Umfarei	449,091	1,425,800	263	1578
		Elsoog	448,761	1,424,591	60	360
3	Alatshaan	Alatshaan	438,648	1,413,169	310	1860
4	Elgeleah Eshargeah	Elgeleah	452,620	1,425,553	126	756
		Tloohi	455,280	1,424,341	159	954
5	Danab Eligil	Danab Eligil	439,772	1,406,318	162	972
		Dogol	441,219	1,406,910	36	216
		Umghisain-1	438,210	1,405,512	19	114
		Umghisain-2	437,551	1,405,970	81	486
		Umghisain-3	437,060	1,406,319	39	234
6	Mahabooba	Mahabooba ELgoz	440,600	1,411,279	58	348
		Mahabooba Elmedrasa	440,495	1,410,786	71	426
		Mahabooba	440,121	1,410,495	40	240
		Mahabooba Eddeker	439,718	1,409,795	50	300
7	Ausooda	Ausooda	451,400	1,423,729	149	894
	Total Population in the Selected Project Sites				**2,095**	**12,570**

4. Objectives of the consultancy:

- Undertake the assessment on surface water and on groundwater utilization/potential/availability and develop water management plans in Al Salam Locality in the execution area mentioned above.
- Recommend the appropriate, innovative water harvesting structures and storage infrastructure (e.g. simplified water tanks, water jars, sunken dams, micro-dams, sand dams, water pans, valley dams, rock water harvesting, roadside water harvesting facilities, water ponds, and locally dug underground tanks, deep and shallow wells.
- Recommend mini-irrigation and water delivery systems (e.g., gravity flow scheme, micro-irrigation systems, check dams, drip irrigation borehole irrigation and solar-powered irrigation systems)
- Recommend a suitable way to support the protection of water wells and springs to ensure quality, quantity, and efficient water use.
- Recommend how to Promote appropriate soil and water conservation measures (e.g. terraces, contours, conservation/minimum tillage, pit gardening, Zai pits, and home gardening)
- Review /develop regulatory framework and guidelines on groundwater sources
- Recommend suitable methods to restore degraded water catchments to improve recharge rates of groundwater

5. Methodology

The consultant will field visits to Al Salam Locality to the selected clusters to make the assessment of the surface water and groundwater and to select the sites for the innovative measures also conduct desk studies and organize face-to-face meetings with stakeholders, line ministries, and governmental entities' officials that manage the water resources in the area.

6. Deliverables

The deliverables include Three final reports that incorporate comments received by the consultant from the meetings and workshops that will be held by the PMU. These reports are:

- **Report 1:** On the assessment of surface water and on groundwater utilization/potential/availability and develop water management plans and on regulatory framework and guidelines on groundwater sources
- **Report 2**: On innovative water harvesting and storage infrastructure that will provide at least 12 units of water and provide 3 units of mini-irrigation water. And the protection of 3 water wells springs and oases that will provide 3 units of water.
- **Report 3:** On soil and water conservation measures and on restoring degraded water catchments to improve recharge rates of groundwater.

7. Schedule

NO.	Activities	Time for activity	Responsibility	Number of working days for the consultant
1	First draft of report 1	After 25 days after signing the contract	Consultant	25
	Reviewed report + meeting with PMU	Two weeks after submission of 1st version (reviewed by PMU)	PMU	
	Second version	Five days after including PMU comments	Consultant	5
	Meeting with the Ministry	Two weeks after the second version submission	PMU+ Consultant	1
	Final Report	Five days after the meeting (inclusion of feedback)	Consultant	5
2	First Draft of report 2	Twelve days after the final report submission	Consultant	12
	Reviewed report + meeting with PMU	Ten days after submission of 1st version (reviewed by PMU)	PMU	
	Second version	Five days after including PMU comments	Consultant	5
3	First Draft of report 3	After ten days from the second version submission	Consultant	10
	Reviewed report + meeting with PMU	Two weeks after submission of 1st version (reviewed by PMU)	PMU	

	Second version	Five days after including PMU comments	Consultant	5
	Meeting with the Ministry	Two weeks after the second version submission	PMU+ Consultant	1
	Final Reports 2 & 3	Ten days after the meeting (inclusion of feedback)	Consultant	10
	Total			**79 Man/day**

8. Knowledge and Competence Requirement for the Consultancy:

The national consultant to be hired will work in consultation with the DRESSEA project coordinator of the Hydraulics Research Center in the Ministry of Irrigation and Water Resources. The candidate should have the following experiences, skills, and knowledge to be eligible for the assignment.

- Master's degree in water resources management, hydraulics structure, civil engineering, agricultural sciences, environment, natural resource management, social sciences, or other closely related fields;
- At least 10 years of solid experience in the related field;
- Have conducted at least one study on drought due to climate change aspect or on the environment;
- Excellent English language skills networking, communication, and IT skills.
- Excellent reporting-writing skills

9. Disbursement of Funds:

All of the activities will follow the following procedure for payment:

- Advance payment 20% of the contract amount upon approval
- After submission of the first version 20% of the contract amount upon approval
- Final report 20% of the contract amount upon approval
- Final payment will be after conducting the workshop or the training 40% of the contract amount upon approval

10. Supervision:

The consultant/ firm will be under the direct supervision of the project management unit. He/she will submit all products to the project coordinator for review.

11. Submission:

The Consultants/ firm are invited to submit bids, which should include:

a) Technical:

- Detailed CV clearly highlighting the mandates carried out in connection with the consultation as well as copies of certificates from similar services;
- The approach and methodology for addressing the various parts required by the terms of reference, including a detailed list of data and information to be collected and the proposed collection methods as well as the structures, institutions, and resource persons to be contacted, as well as a tentative work plan with deliverables and corresponding timelines.

b) Financial:

The financial offer must be presented according to the detailed activities in section 6 and section 7.

Submission:

The candidate must submit his/her technical and financial offer in a sealed envelope in two separate envelopes bearing on the back "Technical offer" and "Financial offer" according to the offers. All of these two envelopes must be placed in a single closed envelope without a logo, bearing the words "Notice of call for applications – Assessment on surface water and groundwater". addressed to the DRESSEA Project Coordinator, The Hydraulics Research Center, Ministry of Irrigation and Water Resources, Wad Medani-Sudan, no later than **10th of March, 2023** at 12:00 p.m., against a deposit receipt 2% of the offer or through the email info@hrc-sudan.sd writing in the subject the title of the ToR.

After the examination of the files by the Counting Committee, the successful candidate will be contacted directly by the PMU.

After review of the applications by the Bids Assessment Committee, the successful applicant will be contacted directly by the National Coordinator.