**Terms of Reference (ToR)**

**Provision of contractual services for rehabilitation of Wadaa Earth Fill dam**

1. **Background**

Practical Action is an international development organization that puts ingenious ideas to world for people in poverty can change their world. We have office in the UK, Africa, Asia and Latin America. Practical Action registered in Sudan since 1988, working in Sudan in Blue Nile, East Sudan and North Darfur. We work under 3 change ambitions (farming that work, Energy that transform and Cities fit for people).

1. **Introduction**

The Wadi El Ku Catchment Management Project-Phase II (WEK-II) seeks to achieve sustainable improvements in agricultural and related livelihoods through the improved management of natural resources – mainly water, but also soils and forests.

Following the successful implementation of the first phase of the Wadi El Ku Catchment Management Project with financial support from the European Union, the second phase of UNEP’s Wadi El Ku Catchment Management Project will continue to demonstrate how effective and inclusive natural resource management, based on UNEP’s experience in Sudan in Integrated Water Resources Management (IWRM) and in catchment based natural resources management, can improve relationships over natural resources, therefore contributing to peace in a conflict affected region. The project will also improve livelihoods through enabling sustainable increases in agriculture and related value chain productivity. Participating communities will achieve sustainable increases in agricultural and related value-chain production through the rehabilitation and improved management of land, forest and water resources. UNEP’s convening power will continue to bring communities and disparate sectoral institutions together to rebuild relationships over natural resources, thereby contributing to peace. The intent is to refine and strengthen the model for inclusive and effective catchment management developed under Phase 1, which demonstrated a positive impact on the environment and livelihoods, as well as on relationships over resources. This model can be scaled up and replicated elsewhere in Darfur and Sudan.

Thus, UNEP Sudan has received additional funding from the European Union to continue the catchment management and livelihoods project in the Wadi El Ku catchment in North Darfur. The project will continue to strengthen livelihoods and achieve sustainable increases in agricultural and related value-chain production in a wider area of the wadi from Umsayala upstream to Wada’a downstream (about 180 km) through the rehabilitation and improved management of its land, forest and water resources.

The project will achieve this outcome by applying UNEPs and Practical Action knowledge and experience with environmental governance and integrated water resource management to the natural resource management challenges of Wadi El Ku. Concretely, the project will continue to grow and refine a catchment management system in the project area, which brings government and communities together for joint decision making over natural resources. The project will also take actions that open up and improve livelihood options and practices for farmers, agro-pastoralists and pastoralists living in or migrating through Wadi El Ku. It will help these communities to better manage their soil, water and forest resources, and to address the growing soil erosion and land degradation problem in the area. In addition, the project will use these activities to strengthen community-based decision-making and peacebuilding around natural resource management issues, and to promote community participation in an improved system of integrated catchment management and governance. Another area of emphasis will be to strengthen data driven decision-making, through focusing on generating the data and science needed to improve decision-making around water resources in the wadi. Finally, state government’s involvement will continue to be promoted, building on the capacity building programme implemented under Phase 1, to better support, scale up and replicate integrated and inclusive catchment management, at both the technical and policy levels. The project will continue to pay attention to the documentation of successes and lessons learned during implementation, with a view to informing the development of a general model of catchment management that will have wider application in the region and the country.

The WEK-II objectives are: Improve natural resource use and management in Wadi El Ku. As well as communities apply improved techniques in natural resources management and agriculture. With an overall impact of establishing climate resilient livelihoods and reducing natural resource conflicts as well as displacement due to loss of livelihoods in North Darfur.

The system of catchment management will be underpinned by UNEP’s understanding and experience of integrated water resource management and Practical Action experience in the livelihood, food security and community organization and empowerment. IWRM demands a holistic approach to water resource management, which takes account of the views and needs of all stakeholders, while being well informed by good science and considerations of environmental sustainability. In other words, IWRM is essentially an inclusive decision-making process built on a foundation of good science.

During the planning process through participatory approach, Wadaa communities prioritized Rehabilitation of weir as one of the community top issues. The weir is used for providing agriculture water. This ToR aims at conducting the Rehabilitation of the weir activities.

1. **Objectives**

The services to be rendered under this ToR are aimed at providing comprehensive Rehabilitation activities necessary for rehabilitating a weir for providing flood irrigation water for beneficiaries. It is mainly to modify and reconstruct the existing Wadaa dam for partially harnessing the water of Wadi El Ku seasonal stream flow for the purpose of drinking water and agriculture

* Stand on current situation of Rehabilitation weir for store and spreading water
* Used to collection water and retaining.
* Supplementary irrigation
* Provide clean water for human and animals
* Feeding the underground water in the U/Sand D/S
* Positive impact for the climate change
* reduce the conflicts due to the shortage of water
* peace building among the communities
1. **Scope of Service**

The scope of work under this TOR is to repair and modify the Wada’ah existing dam for the purpose of the supply of drinking water for Wadaa community and to flood areas to be used for agriculture as another multipurpose of the dam (E: 362145 N: 1418465). The existing Wadaa dam will be partially modified and reconstruct to harness the water of Wadi El Ku seasonal stream flow for the purpose of drinking water and agriculture. The dam at Wadaa has a capacity of 5,119,556 million m3 . The dam will occupy about 2.56 km2 at full storage. The dam has been redesigned to serve a population of about 3,159 families of total population 25,200.

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| --- |
| Preparatory work:Provide for temporary camp and mobilize equipment for excavation for execution of the work including all preparation items, access roads, ramps water for construction …etc. |
| Site Clearance. |
| site clearance of construction and reservoir area removing cart away of trees and trees roots, especially at both abutments.  |
| Earth Work |
| Excavation for embankment foundation cut of 0.1m top soil along dam axis not less than embankment width and cart away including abutments cleaning and cart away. as per drawings, specification and direction of engineers. |
| Excavation for key trench foundation for clay core depths( 1m) for the extension of the dam embankments as per drawings and specification. |
| Excavation for the U/S 2 m cutoff walls, depth 1m ,width 3m along the old existing main spillway and install . Excavation for stilling basin, guide walls and aprons per drawings and specification. |
| Provide material and install of geo-membrane 0.5mm depth 2m , length of 75m from HDPE sheet to cut the seepage under the spillway |
| Provide material (from excavated hafir soil) and construct of silty clay material a compacted homogenous clay dam embankment, founded on silty clay strata (to 95% of dry density) for compaction by layer equal or less than 0.25 m thickness, free of organic matter, tree roots .. etc, including key trench filling, as per drawings, specifications and the directions of the Engineers. The barrow area at the reservoir from proposed hafir 200mx300mx2.7m |
| Provide material and place of compacted not sieved gravel or bolder materials 100mm for crest & u/s and 200mm for u/s thickness of well graded gravel with bolder for dam and protection embankments crest protection and for both D/S & U/S slope as per drawings and specification. |
| Spillway  |
| Provide material and construct of rising of the retaining walls of 1.5m height, 0.5m of the spillway body, 0.4m mortar stone pitching for stilling sasin and D/S Apron of spillway, as per drawing and specification. |
| Provide material and construct of 0.4m dry stone pitching for D/S Apron of spillway, as per drawing and specification. |
| Provide material and construct of masonry guide wall, as per drawing and specification. |
| Provide material and construct of masonry stone waterway 75m width (secondary spillway ) and for D/S Apron of and cutoff walls, as per drawing and specification. |

1. **Deliverables**

The service provider must provide the necessary services deemed under this ToR all to the satisfaction of the site engineer.

**Timeframe:**

This implementation planned to be carried out tentatively in December 2022, unless hard conditions occurred, which need to rescheduling.

1. **Expected Outputs:**
* Used to collection water and spreading and cultivate area
* Are used manage or prevent water flow
* Provide water for lively stock animals and farms
* Improving standard living condition for target community
* Expansion for cultivation land (improve food security)
* Researching underground water tank
* Reduce the conflict and peacebuilding between the community

**ANNEX 1:** Schedule of Requirements

**BoQs and Cost Estimation for rehabilitation of Wadaa Earth Fill dam (Option 3)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item** | **Description**  | **Unit**  | **Quantity**  | **Unit rate USD** | **Amount USD** |
| 1 | **Preparatory work:**Provide for temporary camp and mobilize equipment for excavation for execution of the work including all preparation items, access roads, ramps water for construction …etc. | Job | 1 |  |  |
| **2** | **Site Clearance.** |  |  |  |  |
| 2.1 | site clearance of construction and reservoir area removing cart away of trees and trees roots, especially at both abutments.  | job | 1 |  |  |
| **3** | **Earth Work** |  |  |  |  |
|  3.1 | Excavation for embankment foundation cut of 0.1m top soil along dam axis not less than embankment width and cart away including abutments cleaning and cart away. as per drawings, specification and direction of engineers. | m3 | 1500 |  |  |
| 3.2 | Excavation for key trench foundation for clay core depths( 1m) for the extension of the dam embankments as per drawings and specification. | m3 | 5000 |  |  |
| 3.3 | Excavation for the U/S 2 m cutoff walls, depth 1m ,width 3m along the old existing main spillway and install . Excavation for stilling basin, guide walls and aprons per drawings and specification. | m3 | 1200 |  |  |
|  | Provide material and install of geo-membrane 0.5mm depth 2m , length of 75m from HDPE sheet to cut the seepage under the spillway | M2 | 150 |  |  |
| 3.4 | Provide material (from excavated hafir soil) and construct of silty clay material a compacted homogenous clay dam embankment, founded on silty clay strata (to 95% of dry density) for compaction by layer equal or less than 0.25 m thickness, free of organic matter, tree roots .. etc, including key trench filling, as per drawings, specifications and the directions of the Engineers. The barrow area at the reservoir from proposed hafir 200mx300mx2.7m | m3 | 23000 |  |  |
| 3.5 | Provide material and place of compacted not sieved gravel or bolder materials 100mm for crest & u/s and 200mm for u/s thickness of well graded gravel with bolder for dam and protection embankments crest protection and for both D/S & U/S slope as per drawings and specification. | m3 | 2355 |  |  |
| **4** | **Spillway**  |  |  |  |  |
| 4.1 | Provide material and construct of rising of the retaining walls of 1.5m height, 0.5m of the spillway body, 0.4m mortar stone pitching for stilling sasin and D/S Apron of spillway, as per drawing and specification. | m3 | 200 |  |  |
| 4.2 | Provide material and construct of 0.4m dry stone pitching for D/S Apron of spillway, as per drawing and specification. | m3 | 120 |  |  |
| 4.3 | Provide material and construct of masonry guide wall, as per drawing and specification. | m3 | 40 |  |  |
| 4.4 | Provide material and construct of masonry stone waterway 75m width (secondary spillway ) and for D/S Apron of and cutoff walls, as per drawing and specification. | m3 | 650 |  |  |
|  | **Total** |  |  |  |  |

All other information that we have not provided automatically implies our full compliance with the requirements, terms and conditions of the RFQ.

*[Name and Signature of the Supplier’s Authorized Person]*

*[Designation]*

*[Date]*

 **Stamp**