**Terms of Reference**

Consultancy on conducting a technical feasibility study for the rehabilitation of irrigation canals and installation of water meters in the Ferghana Valley

**Contract type:** Short-term consultancy contract
**Duty Station:** Both home-based and field missions in the target areas.
**Duration:** April 2024 – June 2024
**Location:** Kyrgyzstan, Tajikistan and Uzbekistan

**Acted**

Acted is an international NGO established in 1993 and headquartered in Paris, France. In line with its global "3Zero" Strategy: Zero Exclusion, Zero Poverty, Zero Carbon and in pursuit of its triple mandate as a humanitarian, environmental and development actor, Acted is supporting 20 million people across 43 countries worldwide in response to the triple planetary crisis.

Acted has been working in Central Asia since the 1990s to address the region’s main challenges by fostering opportunities for sustainable and inclusive development, especially for remote and marginalized communities. Over the years, Acted has built diverse sectoral expertise and long-standing partnerships with communities, government agencies, civil society and development partners. Acted works closely with all on a variety of issues including Climate Change Adaption (CCA), Disaster Risk Management (DRM), and Natural Resource Management (NRM).

**Background**

Acted launched the STREAM regional programme in the Fergana valley to foster integrated NRM to improve the sustainable use and availability of water and land resources in the context of the ever-increasing impacts of climate change. STREAM is a principles-based programme, grounded in ‘do no harm’ that is also data-driven and evidence-based.

Within the STREAM Inception Phase, Acted and its partners conducted an area-based rapid assessment of 16 transboundary watersheds in the Fergana Valley to identify the most vulnerable watersheds. Findings revealed that the effects of climate change were most pronounced in the sloped border areas of the valley, where water flows from mountain sources into irrigated plains, and where international boundaries meet. The impacts were most acute in the southwest of the valley, between Batken (Kyrgyzstan) and Sughd (Tajikistan) provinces. The results of the rapid assessment found Kozu-Baglan/Khojabakirgan watershed to be at the greatest risk of resource stress, followed by Isfara, Sokh, Shakhimardan/Ak-Suu, Isfayramsay/Isfayram, and other nearby watersheds. Based on these findings, combined with feasibility and coverage consideration, Acted selected the following watersheds for in-depth assessment and future investment and support:

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| **Watershed**  | **Upstream Country**  | **Downstream Country**  |
| Kozu-Baglan/Khojabakirgan (120 km) | Kyrgyzstan  | Tajikistan  |
| Shakhimardan/Ak-Suu (112 km)  | Kyrgyzstan  | Uzbekistan  |
| Isfayramsay/Isfayram (122 km) | Kyrgyzstan  | Uzbekistan  |

Subsequently, Acted and partners conducted more in-depth targeted assessments to understand exposure to natural, socio-natural, and anthropogenic impacts, the effect of climate change on communities and stresses on water resources and by extension livelihoods. Preliminary findings show climate change has most impacted rainfed crop yields, while irrigated lands remain productive, making the rehabilitation of irrigation networks critical for community climate resilience. However, the existing irrigation infrastructure that belongs to local stakeholders, are currently near to or obsolete causing high levels of water loss. For example, approximately half of the infrastructure of the Teshik 2 canal in Katran and the Magistral canal in Leilek in Kyrgyzstan were reported to have deteriorated, denying water to hundreds of hectares of farmland. Meanwhile, the deterioration of the Nazergiev and Kozo-Kayuir canals in Kadamjay in Kyrgyzstan has threatened entire villages as dwindling water supplies have failed to reach communities at the end of the canals. The rehabilitation of these and other canals, including water gates, has been highlighted by numerous stakeholders as being the most important issue for improving water efficiency within the Kozu-Baglan/Khojabakirgan, Shakhimardan/Ak-Suu, Isfayramsay/Isfayram watersheds.

**Assignment**

Based on the above-mentioned assessments and following signature of agreements with relevant national authorities in all three countries, Acted is now announcing this call for tender to conduct a technical feasibility study. The study built on the data gathered through the assessments mentioned above and will explore in more detail the best options for improving irrigation water use efficiency in the Kozu-Baglan/Khojabakirgan, Shakhimardan/Ak-Suu, Isfayramsay/Isfayram watersheds (hereafter ‘the watersheds’). The scope of work will cover the three Fergana Valley countries: Kyrgyzstan, Tajikistan and Uzbekistan.

**Objectives**

The objectives of conducting the technical feasibility studies are the following:

* Identify the most suitable irrigation systems (and or sections of those systems) for rehabilitation works in the watersheds and define the scope and methods of the rehabilitation works taking into account the available project budget;
* Identify the most appropriate water measuring technologies and locations to install them in the watersheds taking into account the available project budget;
* Outline the structure and design of a joint database for water monitoring in the watersheds;
* Assist in preparing design, technical package and Operations and Maintenance (O&M) plans for all of the above as required.

**Tasks**

**Task 1. Conduct a general assessment of the watersheds’ irrigation systems**

In the framework of this task, and building on the data which Acted will provide, including hydrological studies considering water discharge, precipitation trends, landslides, earthquake, soil erosion, land degradation, flooding etc. parameters were conducted for the selected watersheds during the inception phase. The technical feasibility study will support the findings from the Inception Phase with additional information on canal conditions and their vulnerability to disasters. All infrastructure works will consider Disaster Risk Reduction aspects. IMPACT, Acted’s sister organization, will provide hydrological and remote sensing models when relevant, the Consultant shall assess the overall water availability in the watersheds’ irrigation systems, water allocation among the different sectors, and evaluate the current and perspective water surplus/deficit in the command area of the above-mentioned watersheds. Also, the Consultant shall analyse the water losses in the irrigation systems of the target watersheds, and determine the existing crop yield in the project targeted area and how upgradation will impact the future yields, and study the technical conditions of all existing irrigation infrastructure. The scope of study under Task 1 should include, but not be limited to the following:

***1.1.******Assessment of******water surplus/deficit and evaluation of water losses***

1.1.1 Taking into consideration the available water resources in the sub-basin, requirements of the water-use sectors, as well as limitations imposed by transboundary agreements and minimum environmental flow requirements, study the technical conditions of all existing irrigation infrastructures in the irrigation system (water intake dam, waterworks, pump stations, etc.), identify destruction shear, drawdown and other demonstrations of stability loss. Determine water losses from the water intake dam, pumping stations, and other regulatory and transport route structures.

1.1.2. Map the existing irrigation systems (including primary, secondary and tertiary canals) in the watersheds.

***1.2.******Institutional, social and gender analysis in the command area of the watersheds’ irrigation systems***

1.2.1. Conduct social and gender analysis, focusing on the role of women in the water management process in the target watersheds, taking into account the principles of integrated N/WRM.

1.2.2. Conduct institutional analysis of the existing decision-making structures, tasks and responsibilities, and identify weaknesses and recommendations for their improvement.

By building on existing data and going into more geographically focused and technical detail, the Consultant will be able to provide a clear understanding of the current state of water resources, infrastructure, and management dynamics within the identified watersheds. This assessment will lay the groundwork for Task 2 and informed decision-making and investments to enhance water efficiency and sustainability.

**Task 2.** **Formulation of recommendations for increasing the efficiency of watersheds’ irrigation systems and water monitoring**

ln the framework of this task, the Consultant shall identify the economically viable options for improving the efficiency of the watersheds’ irrigation systems through the modernization of irrigation infrastructure (water measurement, hydro-posts, pipelines/canals, other hydro-technical facilities), reduction of water losses and application of integrated N/WRM principles. The scope of work under Task 2 should include, but not be limited to the following:

**2.1. Identification of sustainable options for increasing the efficiency of irrigation systems through targeted investment in rehabilitation**

2.1.1. Develop recommendations for improvement of efficiency of the watersheds’ irrigation systems through modernization of irrigation infrastructure and application of integrated N/WRM principle, based on the following 3 scenarios: (a) status quo; (b) full modernization; (c) partial modernization, taking into consideration the financial feasibility. For each scenario, a cost-benefit analysis should be performed, and economic efficiency should be calculated. As a result, the most economically viable and environmentally friendly water-saving options for modernization/rehabilitation should be suggested, taking the available budget into account.

2.1.2. Based on analysis of the water losses in the irrigation systems, identify and propose c orresponding rehabilitation works to reduce water losses

1. **2.2. Development of suitable water accounting systems**

2.2.1. Analyse the different types of water meters available and provide a recommendation on the type that will best serve the goal of maximizing water efficiency, within the available budget.

2.2.2. Identify critical locations for the installation of selected water meters that will best serve the goal of maximizing water efficiency, within the available budget

1. **2.3. Development of data management system for water**

2.3.1. Review the existing national and regional water monitoring databases through comparative analysis and suggestion of software compatible with the proposed water measuring technology.

2.3.2. Conduct a cost-benefit analysis of establishing the water monitoring database and cost estimates of the needed hardware to run the database

2.3.3. Develop an O&M plan for the suggested database and propose a sustainability plan

2.3.4. Develop training materials to increase the capacities of the responsible authorities in the operation and maintenance of the water monitoring database in the watersheds

The assigned feasibility study is multi-faceted, comprehensive, and critically important for the sustainable modernization of the irrigation infrastructure within the watersheds. Each element of this study is pivotal in shaping the strategic and efficient utilization of resources, aimed at bolstering the resilience and sustainability of the irrigation systems.

**Deliverables**

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| **Tasks** | **Deliverables/Output** | **Budget (# of days after the contract start date)** |
| Kick-off | Presentation; final approved workplan and schedule | 10% (5) |
| 1.1.1, 1.1.2, 1.2.1, 1.2.2.2.1.1, 2.1.22.2.1. 2.2.22.3.1, 2.3.2(incl. field work in all 3 countries) | Inception report and presentation, including:-initial assessment, social analysis and mapping-recommendations on infrastructure type and locations (per country)-recommendations on water metre type and locations (per country)-recommendations on establishing a water monitoring database | 40% (25) |
| 2.3.3, 2.3.4(desk work) | Develop a water data management system for each country: or:-O&M plans, training materials for water monitoring database | 30% (20) |
| Final documents(desk work) | Final feasibility study, combining inception report and further observations and including final versions of document packages (as annexes) revised as per comments provided by Acted | 20% (15) |
|  |  | 100% (65) |

**\* All deliverables as per the scope of work must be satisfactorily completed and accepted by Acted to facilitate payment. Bidders should provide estimated working days in their proposal.**

**Expected timeline**

The activity is expected to be completed between April and June 2024.

**Submission requirements**

* A technical proposal with the methodology/approach to managing the assignment, showing an understanding of tasks (not more than 5 pages). This should include methods for:
1. evaluating the total water availability within the watershed’s irrigation systems, encompassing both surface and groundwater sources;
2. analysing the causes of water losses within the irrigation systems of the designated watersheds, with a primary focus on factors such as leakage, evaporation, and inefficient distribution;
3. investigating the current allocation of water among different sectors, including agriculture, industrial, and domestic usage;
4. analysing the existing and potential water surplus or deficit in the selected watersheds’ irrigation systems. This analysis should consider both current conditions and potential impacts due to climate change; and
* A financial proposal in USD(separate from the technical proposal) must be developed in the provided Acted template (PRO-06 Offer form) including all applicable taxes and/or daily rate, as applicable.
* A timeline for the completion of each deliverable of the feasibility study.
* Project references from similar studies (at least 3).
* CVs of each consultant team member.
* Company or Organisational profile if applicable.
* Company registration documents and a copy of legal representative ID.
* Completed package of provided Acted BEST documents PRO-06.2 Supplier’s ethical declaration, PRO-09 General conditions of purchase, PRO-03.2 Supplier’s questionnaire) and PATRIP Foundation Standard Bidding Documents for Procurement of Services under Bracket 2.
* Declaration of Undertaking signed by the bidder.

\*Applications without technical and financial proposals will not be considered.

**Assessment Criteria**

The Contract will be awarded to the candidate obtaining the highest combined technical and financial scores, subject to the satisfactory result of the verification interview.