**TERMS OF REFERENCE**

**Purpose of the Assignment: REVIEW OF IMPLEMENTATION OF MULTI-USE SOLAR DRIVEN WATER SUPPLY SYSTEMS IN MOZAMBIQUE AND DOCUMENTATION OF LESSONS LEARNT AND GOOD PRACTICES**

**Section Submitting: WASH**

**PURPOSE AND OBJECTIVE.**

**Background and Context**

Solar driven water supply systems have increasingly been used to increase access to water supply in rural areas where there is no access to conventional electric networks, as well as an option to reduce operation and maintenance costs associated with water production while reducing greenhouse gases emissions. In Mozambique, this technology has been used by multiple partners, including Government and cooperation agencies as part under rural water supply interventions (PRONAR / PRONASAR), both at community and institutional level. More recently, multiuse solar driven water supply systems have been implemented to strengthen community resilience and increase availability of water in drought prone areas.

Specifically, UNICEF supported interventions have been implemented since the 90s, throughout rural water supply programmes such as PRONAR, One Million Initiative, and more recently as part of its response to the drought that affected Mozambique in 2016 / 2017.

Despite the growing emphasis in implementing solar driven systems, there has not been any systematization on the technical approach, designs and overall recommendations that can inform the WASH sector in Mozambique, so the use of this technology can be widen, to support the expansion of water supply coverage in the country.

To attend the identified need for documentation of the experiences in implementing of solar driven water supply systems in rural areas of Mozambique, UNICEF is looking for a consultant to review, analyze and document the existing experience in the design, construction and operation and management of these systems, with the objective of inform and provide guidance to WASH sector partners.

Objectives, Purpose and Expected Results

The main objective of the consultancy is to identify, and document lessons learnt and best practices, through a field reviews, of the implementation of water supply systems powered by solar panels in previous years in Mozambique, so to inform WASH sector for future interventions.

The specific objectives are:

* To identify the best practices of various designs used in the construction of solar driven water supply systems and propose standard designs for its various components.
* To record and analyse short-comings / difficulties faced by users in the operation of the above indicated systems and recommend measures to overcome these.
* To document the modalities in use for the operation and maintenance of these systems, highlighting the good practices and providing recommendations for replication.

**METHODOLOGY AND TECHNICAL APPROACH.**

* **SCOPE OF THE REVIEW**

The review of implementation of multi-use solar driven water supply systems will include projects implemented in the context of the PRONASAR in the last 5-10 years. The review will aim to cover solar driven water supply systems in at least four provinces throughout the country, covering the southern, central and northern areas (exact locations to be confirmed during the desk review).

* **METHODOLOGY**

To undertake the review the Consultant will rely both on documentary information as well as on information to be collected through site visits and interview with stakeholders and beneficiaries. The following summarizes the sources of information to be considered during the review.

* Review of documentary information, such as
* Terms of Reference / Contracts,
* Technical designs, specifications, blueprints, etc.
* Monitoring reports (from Engineering Consulting Firm / Fiscal),
* Other technical documents produced for the implementation of works, to be made available by stakeholders.
* Interview with stakeholders, including:
* Implementing agencies,
* Provincial and District water departments,
* Engineering Consulting Firms (fiscal),
* Contractors / Designers,
* Suppliers / other technical support,
* Site visits and technical inspection of selected systems. These are aimed to confirm technical conditions of the systems and its various components, and to gather information on issues related to the operation and user satisfaction of the system. Site visits will include on site discussions with water committees, community management groups and / or operators in charge of running of systems and with beneficiaries (for selected systems).

Following the site visits and review of technical documentation, Consultant should present preliminary sketches and schematics for designs to be reviewed by UNICEF and partner through a consultative meeting to receive feedback for the development of final products.

Preliminary findings and draft final products are to be submitted for a final review and validation by UNICEF and partners. Final review and validation will include a which will include presentation to WASH partners through a validation meeting. Feedback from such meeting is to be documented on a specific report and included in the final version of the products (see below on description of deliverables).

* **ELEMENTS OF ANALYSIS**

The following presents the various aspects to be included in the review. Complementary questions could be developed at the early stages of the consultancy, however the below delineates the main elements for analysis.

1. **PREPARATORY PROCESSES**

* Criteria for selection of targeted communities. How these were determined (or influence) the type of systems installed;
* Selection process for implementing agencies / contractor. Are there specific criteria related to solar powered systems required for selection;
* Technical specifications for components, materials and equipment. To identify components that require detailed specifications and what these should be.
* Contracting modality: To identify pros and Cons of modality used during implementation (Turn-key, Design and Construction, etc.).

1. **IMPLEMENTATION**

* Approach to the design of the systems. Key features (including sizing of systems, modular components, security, multi-use features, etc.) and their impact on scope of works, construction time, system operation and usage,
* Constraints faced during design and construction of the systems, and identification of mitigation measures.
* Analysis of unit costs (and drivers for cost increase/decrease) and cost per beneficiary vs. level of service provided.
* Tools and materials used for training on Operation and Maintenance of solar water supply systems to the designated operator

1. **MANAGEMENT AND USE OF SYSTEMS**

* Actual utilization of installed capacity of the systems. Correlation number of beneficiaries and systems’ maximum capacity and operation time of systems.
* Operation and management modalities (by whom, how were they selected) and level of operation performed to date (identification of main constraints for operation / failures on the systems experienced so far and how these were addressed).
* Other uses of the system besides water for human consumption (cattle, gardening, etc.) and how are these managed.
* Beneficiary / users perceptions on the impact of the systems over their day-to-day use, including:
* Usage of water (quantity) per family
* Water tariff
* Improved hygiene practices due to better water availability
* Effect of increased water over drainage / waste water
* Others perceived by beneficiaries and local stakeholders.
* **FIELD WORK**

The review will include a technical inspection of selected systems. Specific location of systems is to be determined at the early stages of the consultancy, however these are to include:

* At least four provinces, covering the south, centre and northern region.
* At least two systems per province, in two different districts (one per district).
* Systems from various implementing agencies to be included
* Final list of sites should include:
  + 1. systems with various modalities of management and operation,
    2. at least 50% of systems being multi-use (water for cattle, gardening, others),

Final schedule for field visit will be subject to approval of the Inception Report where Consultant should propose the final list of systems and rationale for selection.

Travel logistics are to be arranged by UNICEF. Perdiems will be paid to

* **DOCUMENTATION / SYSTEMATIZATION OF GOOD PRACTICES AND LESSONS LEARNT**

The following documents are to be produced as part of the consultancy:

* Main report on the overall findings and recommendations, highlighting specific areas of importance based on good practices and lessons learnt from the implementation of projects under review;
* Recommendations for design and construction, including specific criteria or methods to be used during implementation.
* Proposed terms of reference for procurement of services for: A) design and B) construction
* Modular designs for the components of a typical solar driven water supply system, including blueprints, design tools, sample bill of quantities and technical specifications as required.
* Outline for a manual for operation and maintenance, including list of key tools and other materials required;
* Identification of good practices for management of systems under review, including recommendations from specific mechanisms implemented at community level (engaging of individual operator, modalities for payments, etc.)
* Documentation of specific cases highlighting best practices and lessons learnt (using format to be developed at the beginning of the consultancy).

**ACTIVITIES AND TASKS.**

| **Task** | **Estimated time allocation** |
| --- | --- |
| ***Review of documentary information, interviews at national level and preparation for field work*** | |
| * Desk review of project documentation (i.e. contractual documents, specific designs, technical reports, etc.) | 1 week |
| * Interview with national level stakeholders / representative from implementing agencies to clarify on scope of projects, implementation methodologies, etc. |
| * Preparation of detailed workplan, data collection tools and others required for field works |
| ***Technical inspection and field visits*** | |
| * Site visits to eight selected communities across four provinces, including technical inspection of systems and interview with local stakeholders and beneficiaries | 4 weeks |
| ***Review, consultation and feedback with WASH stakeholders*** | |
| * Meeting with key informants and stakeholders to review / comment preliminary sketches / schematics and other key highlights presented in the intermediate report | 2 days |
| ***Documentation of good practices and lessons learnt*** | |
| * Development of technical documents (terms of reference, designs and bill of quantities, O&M manual, etc.) | 4 weeks |
| * Preparation of draft report, including recommendations, good practices and field level cases |
| ***Final review and validation with stakeholders*** | |
| * Presentation and validation meetings with stakeholders on final drafts | 2 weeks |
| * Incorporation of feedback and development of final documents |
| ***Presentation of final results*** | |
| * Presentation to national stakeholders through sectoral meeting | 2 days |

**DELIVERABLES AND PAYMENTS.**

| **Item** | **Deliverable(s)** | **Associated activities** | **Timeline for submission** | **Comment** |
| --- | --- | --- | --- | --- |
| ***Desk review of documentary information*** | | | | | |
| 1 | Inception report, including:   * + - * + Literature review         + Proposed data collection tools         + Detailed workplan | * Desk review and preliminary analysis of documentary information | Week 2 | To be presented and discussed with UNICEF and key stakeholders at inception meeting |
| 2 | Intermediate report with key findings from site visits and interviews and preliminary sketches / design for technical discussions | * Technical inspections and interview with national level and local level stakeholders | Week 7 | Findings to be presented through a review meeting, for discussion before development of technical documentation |
| 3 | Draft final report, including   1. Main document, including recommendations, good practices and lessons learnt 2. Package of technical documents:    * + - * Terms of reference,          * Technical designs / blueprints / drawings          * Technical specifications          * Bill of quantities,          * O&M manuals          * Others | * Analysis and documentation of good practices and lessons learnt. | Week 12 | Draft package to be presented for review and consultation with UNICEF and key stakeholders |
| 4 | Final report, including:   * Main document with key conclusions and recommendations * Revised package of technical documents * Documentation of good practices and most successful cases for management of solar water supply systems. * Power point presentation summarizing findings and technical documentation produced. * Summary / minutes of meeting for presentation of findings. | * Review of technical package * Consultation with and feedback from stakeholders * Presentation of findings | Week 16 |  |

Payments will be processed upon acceptance of the corresponding deliverable and against an invoice that will reference the contract and deliverable numbers. Payments will be approved by the Chief of WASH.

*Deliverable 1:*

Delivery timeframe: 3 weeks

Deliverable/product(s): Inception report

Payment: 20%

*Deliverable 2:*

Delivery timeframe: 6 weeks

Deliverable/product(s): Intermediate report

Payment: 40%

*Deliverable 3:*

Delivery timeframe:

Deliverable/product(s): Final report, and associated documents

Payment: 40%

**MANAGEMENT AND SUPERVISION.**

Consultant will report to the Chief of WASH, UNICEF Mozambique. The day-to-day supervision and follow up of activities will be done by the WASH Section, through the Chief of WASH or his designated representative.

Review and approval of reports and tools are to be done through a coordination committee including UNICEF and other institutions, including Government partners (DNAAS, etc.).

Specific deliverables and reports are included in the table above. **Final reports and** **deliverables** must be produced in Portuguese **and** English.

**QUALIFICATIONS AND SPECIALIZED KNOWLEDGE.**

Consultant should have a proven experience in the design and implementation of rural water systems, including experience in solar driven water schemes. Candidates should cover the following aspects:

**Academic qualifications.**

University degree in Public Health, Civil / Mechanical / Hydraulic Engineering or other WASH related area.

**Work experience.**

* Minimum of ten years of relevant experience in Civil and Hydraulic engineering, including design, construction, and /or oversight of construction of water supply systems. Specific experience on solar powered water supply systems is required.
* Minimum of five years of relevant experience in technical support for management, operation and maintenance of solar powered rural water supply systems, including community management.

**Specific knowledge, competencies, and skills required.**

* Proven experience in review and documentation of lessons learnt and good practices of development interventions in the WASH sector

**Language skills.** Fluency in Portuguese and English.

**CONDITIONS OF WORK.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Items** | **Provided by UNICEF** | | **Remarks** |
| **Yes** | **No** |
| Service incurred death, injury or illness | X |  | Per the provisions of CF/IC/2013-001 on insurance coverage “in cases of service-incurred injury, illness or death under a third-party provider”. |
| Health Insurance |  | X | Consultants are to provide their own health insurance when the assignment requires traveling beyond commuting distance. |
| Office Space |  | X |  |
| Computer in office premises |  | X |  |
| Access to printer in the office premises |  | X |  |
| Airtime |  | X | Data up to: [Insert as applicable]  Voice up to: [Insert as applicable] |

**IN-COUNTRY TRAVEL.**

Consultant will be based in Maputo, with travel to selected sites for validation. In-country travel will be organized and paid for by UNICEF through a Travel Authorization as per the applicable policy, including transportation, standard terminal expenses, and per diem at 75% of the applicable UN Mozambique DSA rate.

For international applicants, international travel and per diem while in Maputo should be included in their financial proposal as an all-inclusive fee for the entire consultancy.

**EVALUATION CRITERIA.**

The selection of the consultant will be based on a best value for money principle, considering both technical and financial proposals submitted for the consultancy. The technical evaluation criteria are stipulated below.

|  |  |  |
| --- | --- | --- |
| **Item** | **Technical Criteria/Qualifications** | **Max. Points** |
| **1** | **Education** | **10** |
| **1.1** | Advanced university degree in Public Health, Civil / Mechanical / Hydraulic Engineering or other WASH related area. |  |
| **2** | **Work Experience** | **30** |
| **2.1** | Minimum of ten years of experience working in planning and implementation of water supply interventions, including previous works in rural areas in development countries |  |
| **2.2** | Previous experience on strategy development and development of methodology and tools for water supply assessments, |  |
| **3** | **Technical Skills and Knowledge** | **30** |
| **3.1** | Experience and technical understanding of drinking-water quality and safety, water infrastructure in rural areas and small towns (including management, operation and maintenance) and use and acceptability aspects of water |  |
| **3.2** | Familiarity in the use of water safety plans or similar risk management tools for water supply systems. |
| **3.3** | Language skills |
|  | ecblank**Total Technical Score** | **70** |
|  | **Minimum Technical for pass to financial assessment** | **50** |
|  | *Only those candidates meeting the minimum technical score will be eligible for further review.* | |

**REMARKS.**

Proposed timelines and time allocation presented in the above sections are indicative.

In-country travel for field visit and validation are to be covered by UNICEF as per indicated above. All other costs, including international travel, daily subsistence while in Maputo and professional fees, are to be considered in an all-inclusive financial proposal.