**Annexure A**

**Terms of Reference**

**Supply and installation of solar powered GSM-based real-time groundwater well monitoring system.**

1. **Background**

The International Water Management Institute (IWMI) seeks to engage a consultancy firm to develop and install real-time automatic groundwater monitoring equipment in the Jaffna Peninsula. This system will be designed for automatic monitoring of groundwater levels and electrical conductivity at selected locations. The selected consultant will work closely with a team comprising IWMI staff, other consultants attached to IWMI, and the relevant other technical institutes and experts, ensuring regular communication and updates throughout the manufacturing and installation. This assignment is part of the FCDO-funded groundwater management project on the Jaffna Peninsula.

1. **Scope of the work**

The project focuses on developing a groundwater management strategy for the Jaffna Peninsula, emphasizing the importance of real-time groundwater monitoring system. This system will provide crucial data on groundwater levels and electrical conductivity, addressing existing data gaps and informing sustainable resource management. The project aims to create effective adaptation strategies. Collaborative research and stakeholder engagement will ensure the project's social and institutional integration. The approach combines technical knowledge and monitoring with a Multi-stakeholder Platform to support evidence-based decision-making and long-term sustainability.

The following are the proposed features\components of the groundwater monitoring System; however, the vendor can also propose innovative solutions to strengthen the proposed framework.

* **Real-Time Data Transmission**: The system must continuously transmit real-time data on groundwater levels and electrical conductivity to a central database, ensuring immediate access for analysis and timely decision-making to maintain resource sustainability.
* **Durability and Weather Resistance**: The equipment should be robust and capable of withstanding harsh weather conditions, including high humidity, saline environments, and extreme temperatures.
* **High Precision and Accuracy**: Sensors must deliver consistently accurate and reliable measurements of groundwater levels and electrical conductivity, ensuring precise data for effective monitoring, analysis, and sustainable management of water resources.
* **Remote Monitoring Capability**: The system should enable remote monitoring and control, providing users real-time data access via a secure online platform. This ensures that stakeholders can manage and analyze information from any location efficiently.
* **Energy Efficiency**: The equipment should be energy-efficient, with the option for solar power integration to ensure continuous operation.
* **Data Storage and Backup**: The system must include local data storage with automatic backup to prevent data loss during transmission failures.
* **Data Management Software:** An appropriate user-friendly software for real-time data visualization and analysis. Cloud-based dashboard for remote access and long-term data storage.
* **Low Maintenance**: The system should require minimal maintenance, with easy access for servicing and repairs when necessary.
* **Scalability:** The system should be scalable, allowing for future expansion to additional monitoring sites as needed.
* **Alarm and Notification System**: The equipment should include an alarm system that triggers notifications in case of abnormal readings or system malfunctions.
* **Safety Features:** Lightning protection. Overvoltage and overcurrent protection. Tamper-proof housing.
* **Compliance with Local Standards**: The system must comply with Sri Lankan regulations and standards for environmental monitoring and data management.

1. **Schedule of requirement:**

The following are the required technical specifications

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| --- | --- | --- |
| **No.** | **Technical specifications for:** | |
| 1. | Supply and installation of **minimum 15 numbers** of solar powered GSM based powered-groundwater well monitoring systems with the following details: | |
| **Component** | | **Description** |
| 2. | Inputs Sensors & Data logger | Capability for automatically monitoring groundwater level & salinity in borehole\ groundwater wells. Level sensor range 0-50.00m, Electrical Conductivity (EC) sensor 0-20,000 µS\cm (Micro Siemens per centimeter). Must support analog and digital inputs for sensors and have sufficient data storage/transfer capabilities. |
| 3. | Power Supply | Solar panel: minimum 20W |
| 4. | Data update frequency: | 1 hour or less |
| 5. | Accuracy | +/-1cm, cable length 100m |
| 6. | Mast | Mast height: minimum 3m |
| Mast material: GI 2mm thick 100mm hollow box bar |
| 7. | Enclosure | Data logger, Pressure sensor & Temperature sensor should be concealed and waterproof and corrosion proof |
| 8. | Safety Features\ Over-voltage protection | Lightning protection. Overvoltage and overcurrent protection. Tamper-proof housing. Operating temperature rage -5 to 60 C0 |
| 9. | Warranty | Minimum 2 years |
| 10. | Data Management Software | Appropriate user-friendly software for real-time data visualization and analysis. Cloud-based dashboard for remote access and long-term data storage. |
| 11. | Installation of a chain link fence (1m X 1m X 1.2m) WLH around the ground well monitoring station equipment | |
| 12. | Comprehensive ground well monitoring station equipment maintenance and data hosting for minimum three (03) years after warranty. | |
| 13. | Online web portal for data visualizing and downloading facility | |
| 14. | Training & Installation; the supplied product features demonstration shall be provided. The training on supporting software, field demonstration and know-how of the installation of the complete data logger unit at a client provided site shall be conducted. (Installation should be done to the observation borehole with diameter minimum110 to 140 mm PVC or unlined). | |
| 15. | Telemetry– Data Transmission System; the data transmission system should be tightly integrated with the GW Data Logger in field mounted systems consisting of battery, modem and antenna and the Data Transmission System must be from same manufacturer as GW Data Logger for smooth integration & performance. | |

1. **Period\Timeline The project is expected to be completed within [insert timeframe], with the following milestones:**

* Installation and testing completion: 15th March 2025.
* Submission of relevant technical data and reports: 20th March 2025.
* Trainings: 15th March 2025

1. **Proposal structure:**

The project's primary goal is to identify strategies for enhanced management of groundwater resources Jaffna Peninsula, northern Sri Lanka. This involves mitigating threats to both the quantity and quality of these resources, ensuring sustainable agriculture, resilient livelihoods, and environmental integrity in the face of climate change. To achieve these objectives, IWMI expects the vendor to deliver state-of-the-art technologies and innovative solutions tailored to the project's needs. Vendors are requested to submit the following components.

1. About the company/firm
2. Concept approach to Implementation (Background, Objective, working methodology, deliverables, maintenance and security, equipment deployment, Technology transfer, Work Plan)
3. Provide clear evidence on your past assignments that aligned with the current requirements.
4. Financial proposal (total cost, payment schedule, milestone/activity-wise cost Break-down structure, Human resource-wise cost Break-down and module-wise cost Break-down, maintenance support for minimum three years)
5. Preference will be given to firms with demonstrated experience in conducting similar work for international organizations.

Note: Please mention in the proposal if the firm requires an external consultant/institute to fulfill the assignment.

1. **Roles and Responsibilities:**

**Client**

* Provide access to sites and any existing hydrogeological data.
* Review and approve reports and designs.
* Facilitate necessary stakeholder engagements.

**Contractor**

* Execute all tasks outlined in the scope of work.
* Ensure health, safety, and environmental compliance during construction.
* Provide regular progress updates to the client.

1. **Method of selection:**

Selection will be made based on the merit of the technical and financial proposals. An expert panel will review the proposal. At the final stage of the selection, selected vendors may be requested for additional clarification. The selected vendor will work with IWMI for 03 months (2025) to comprehensively implement Jaffna's real-time groundwater well monitoring equipment\system installations.

The evaluation criteria of the proposal are as follows:

Technical proposal (65 Points)

* Understanding the ToR (15 points)
* Proposed Methodology (25 points)
* Adequacy of the proposed work plan (15 points)
* Specific experience of the consulting firm related to the proposal (05 points)
* Overall experience of the consulting firm (05 points)

Financial proposal (35 Points)

* Adequacy of the explanation of cost (25 points)
* Propose maintenance and support strategy (10 points)

A firm will be selected and awarded the contract to manufacture and install groundwater monitoring equipment based on the scoring of both technical and financial proposals.

**Important dates:**

Last date of submission: 22nd January 2025