

Terms of Reference (ToR)

Selection of a consulting firm for the development of an Integrated Management Information System

1. Background

The Community Livelihood Enhancement and Resilience (CLEAR) project aims to improve rural livelihoods and consumption of diverse foods for targeted vulnerable communities, and to respond promptly and effectively in case of Eligible Crisis or Emergency. CLEAR is a community and local development project that builds off the Poverty Reduction Fund series under the Ministry of Agriculture and Forestry, while taking advantage of Lao PDR's changing rural sector and evolving policy framework.

The CLEAR project will develop and maintain a simple and interactive monitoring system for regular reporting and learning at all levels (village, district, and central). Monitoring data and qualitative information will be entered into a web-based Management Information System (MIS), which will serve as the main source of information for semester and annual reports.

2. Objective

The main objective of this assignment is to hire a qualified MIS/IT Consulting Firm (The Firm hereafter) for the design and development of the MIS to make it an integrated MIS Platform to serve as the main source of information for semester and annual reports. In this regard, the following objectives need to be achieved as part of this execution:

- Conduct a comprehensive Gap Analysis, Functional and System Requirements Study; Develop a detailed Functional and System Requirement Study/Gap Analysis Document (SRSD) for review and approval.
- Develop a System Design Document (SDD) as technical system documentation.
- Do design, coding and implementation of the MIS Platform on agreed SRSD.
- Ensure MIS's interoperability with external data sources to integrate data.
- Conduct system installation, configuration on MIS server.
- Handover complete system to CLEAR including full ownership of the source code and system documents.
- Provide monthly technical MIS operationalization and maintenance support throughout the duration of the project up to 45 months from 2023 to 2027, including six months after project closure.

3. Scope of work & service

The scope of work under this assignment covers development, installation, and implementation of the newly developed MIS platform for the CLEAR project. The Firm is expected to perform the following key task under this assignment.

a. Gap Analysis/Functional and System Requirement Study

In preparation for developing the CLEAR MIS the project assigned a consultant to make an assessment of the MIS in a current Poverty Reduction Fund (PRF) project in order to provide some concrete recommendations for the development of the CLEAR MIS. The Firm is expected to conduct a comprehensive Gap Analysis/System Requirement Study (SRS) based on the findings and recommendations in the PRF MIS assessment to expand on the following modules:

Modules	Sub-Modules
Local Community Capacity Strengthening	<ul style="list-style-type: none"> • Participatory Village Development Planning • Community Capacity Strengthening • Climate-resilient Community Infrastructure
Community Livelihoods Enhancement	<ul style="list-style-type: none"> • Self-Help Groups (SHGs) • Producer Groups (PGs) • Income Generation and Food Security Capacity Building • Delivery of Project Grants and Management of Productive Assets • Local Input Suppliers (LIS) • Climate Smart Agriculture and Livestock Practices • Village Youth Facilitators
Community Nutrition Interventions	<ul style="list-style-type: none"> • Promotion of demand for enhanced nutrition practices • Promotion of community-sourced nutritious food
Project Management, Capacity Building and Monitoring and Evaluation	<ul style="list-style-type: none"> • M&E indicator tracking • Environmental and social safeguards • GIS coordinates of the infrastructure construction, SHGs, Local Input Suppliers in the MIS (<i>if a user clicks on the construction name or GIS coordinates, additional window opens with GIS map and symbol on the construction site or SHG or LIS</i>)

Environmental and Social aspects	<ul style="list-style-type: none"> • Receipt and logging of grievances • Grievance assessment and categorization • Investigation and resolution of grievances • Communication and feedback to complainants • Monitoring and reporting on grievance outcomes
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The approach behind Gap analysis would be key to understand the organizational processes and transform it into MIS functionality that will take above modules into consideration for its completeness and interoperability with other sub-systems (such as DHIS2, RRPM Database, Kobo Toolbox; possibly among others); also do a detailed assessment to know how the proposed organizational process under CLEAR project could effectively be mapped with MIS functionality.

Outcome

The outcome of this activity should be a comprehensive and consolidated System Requirement Study/Gap Analysis Document through analysis of its existing and proposed process flows, gaps and process improvements. The Firm must submit the documentation for signed approval as this will be the guideline for systems development.

b) System Design

After the SRSD is approved, the Firm is expected to conduct the System Design of the CLEAR MIS Platform. While doing so, the Firm is expected to document the underlying database structure and reflect both backend architecture and front-end interface design. The System Design Document should also reflect the table definitions and overall database model of the MIS that this document could use as future reference if needed. While this is a comprehensive detailed System Design document this document may be developed in parallel with the MIS Development.

Outcome

The outcome of this activity should be a comprehensive document of System Design on approved SRSD.

c) MIS Development

The Firm is expected to develop the system based on the agreed SRS using proposed technology framework. During this activity, the Firm should follow agile development approach in which the CLEAR Project Management Team can track the progress. Stage planning should be consulted with the Project Management team. Stages include but not limited to:

- Field data collection/entry into MIS database tables
- System integrations with DHIS2 and RRPM database
- User interface design and layout
- Reporting

Outcome

The outcome of this activity is an iterative prototyping progress on application to allow feedback until the prototype is accepted by Project Management Team.

d) System Installation

This activity involves installation and configuration of the system on the allocated server for MIS hosting.

Outcome

The outcome of this activity will be a system installation report detailing installation requirements and server specifications.

e) MIS User Training

This MIS training is an integral part of this assignment. The Firm is expected to undertake a comprehensive training to the users of the MIS at various levels with an aim to ensure that CLEAR staff can use the system independently and perform various reporting functionalities as desired. In addition, piloting of the MIS is required in the village where work has already started during the training and get feedback from the piloting. This piloting means entering data in the MIS and see the generated reports whether they satisfy the semi-annual reports, annual reports, PDO and Intermediate Results Indicators.

To achieve this objective, the Firm is expected to conduct a MIS user-training program for the following personnel:

- Project Management Team
- District level staff
- Field level staff
- Village level staff (Young Graduates)
- MIS Officer (technical training)

The Firm may propose the training duration depending upon the extensibility of MIS functionality. The Firm is expected to develop all training materials in Lao and English language.

Outcome

- Prepare training plan
- Develop training manuals
- Deliver user training
- Deliver technical training
- Gather and evaluate training feedback

f) Operational Acceptance

The Firm should complete all functional and non-functional activity that will ensure seamless run of the MIS.

Outcome

- Gather training feedback and mitigate bugs
- Obtain operational acceptance by the Project Management Team

g) Support Service

The development support service should be completed within the project period. During this period, the Firm must ensure all issues encountered such as bugs, system errors and functional request must be resolved. The development service should cover feature enhancements, customizations, additions of the report as requested by the users. Any requests considered outside the scope of this project will be dealt separately. The SRS document will be referred to as the project scope. CLEAR and the Firm will jointly determine such level of efforts.

Outcome

The outcome of this activity will ensure smooth operation of the system and timely resolution of any bugs/errors encountered during system implementation period.

4. Deliverables

- Gap Analysis/System Requirement Study Document
- System Design Document
- User Training Document
- Technical Manual
- MIS Source Code
- Support and Maintenance Service Contract

A separate service and maintenance contract may be signed with the Firm after this contract period if needed.

5. Payment Terms

- I. 20% of the total contract value will be made after submission and approval of the Gap Analysis/System Requirement Study Document.
- II. 40% of the total contract value will be made after finalization of the System Design document and obtaining operational acceptance by the Project Management Team.
- III. 40% of the total contract value will be made after completing all training, training materials, and agreed support service contract.

6. Requirements

A Firm with broad and demonstrative experience in conducting similar systems is needed. The Firm will be evaluated based on the following:

- At least 10 (ten) years of software development.
- Should have evidence of at least 5 (five) MIS systems.
- Experience conducting system requirements and analysis to map organizational requirements into MIS.
- Experience working with development partner funded project or development agencies regarding software development is an advantage.

It is expected that the MIS platform meet minimum key functional features as outlined in the following table. The Firm must state whether the outlined features can be met in 'Yes' or 'No'. If the Firm opts to say 'No', then it is encouraged to clarify with clear explanation.

TECHNICAL REQUIREMENTS		
#	Design Architecture	Compliance [Yes/No]
1.	Centralized and an integrated platform: A centralized database of beneficiaries and their related information throughout the program activities. The platform should enable CLEAR to keep track of each individual beneficiary across the multiple components facilitating the CLEAR to streamline recordkeeping, standardize information through a unified IT platform.	
2.	Modular: Should facilitate each department or units (e.g district offices) to manage, administer and implement their own functions independently through a common MIS platform.	
3.	Scalable: The design should be flexible to further enhance, customize and build on the existing design framework in case of new programs or business functions are introduced in the future or any changes required in the existing program business process without having to develop a separate system.	
4.	Secure: Should be made accessible to only those users with authorized username/password. The user's ability to operate the system can be controlled and monitored through the MIS access rights and control functionality thereby ensuring robust data security and integrity. Implementation of two-factor authentication and SSL is must.	
5.	Interoperable: Should have a comprehensive functionality to exchange electronic data with other relevant databases/systems (such as table application database, payment service provider database, Health MIS) in a secure environment thereby making the system interoperable with other relevant systems when linkages are made.	
#	Data Security, Access and Authentication	
6.	The security of the system shall be built in by a combination of Login Identification and passwords. The security shall be provided at the Operating System Level (Level 1), Application Login Level (Level 2) and at the Menu/Program Execution Level (Level 3), and are user definable;	
7.	User login, pin-based authentication (two factor authentication) should be implemented based on the requirements;	
8.	The system should be completely secure and foolproof with incorporation of industry standard proven data encryption techniques and methodologies. Those encryption techniques should be audited in timely manner to detect loopholes and updated with the latest patches, in order to ensure that the mechanisms are fitted with the latest security features;	
9.	Implementation of Secure Socket Layer (SSL) is a. The SI is expected to procure SSL certificates on behalf of the Purchaser and implement in the system;	
10.	The system shall provide access control based on the user role types and their privilege level to access certain system functions and system data. Concepts of Triple-A: Authentication, Authorization and Access Control should be implemented to stay in line with the latest security techniques;	
11.	The system shall support a capability to define virtually unlimited number of user types with differing sets of access privilege levels;	
12.	The system shall block the user account for a parameter-driven length of time after a parameter-driven number of invalid logon attempts;	

13.	In case of multiple unauthorized attempts of administrator access, the case should be reported immediately to the designated maintenance and security staffs of the MIS through Email, pop up notification or SMS;	
14.	In case there are 3 failed login attempts for a specific admin user, the IP making the request will be dropped from further access and the password reset request will be issued to the authenticated administrator.	
15.	The system shall provide a capability for the users to change their password;	
16.	The system shall provide a facility to force users to change their password after a parameter-driven time period;	
17.	The system shall provide definable password enforcement rules, including but not limited to: <ul style="list-style-type: none"> • Password length • Required Alphanumeric character • Not same as previously used password 	
18.	The strength of the passwords provided by the users can be measured and suggested as Weak, Medium and Strong;	
19.	The system shall encrypt passwords before storage using the Secure Hash Algorithm (SHA) encryption algorithm or stronger;	
20.	The system should have a functionality for the system administrator to force terminate selected user connections without adversely impacting the system;	
21.	The access control security function shall provide a facility for the system administrator to suspend an existing user's access rights for a specified period of time or indefinitely;	
22.	The system shall provide a facility to automatically lock a user session after a definable period of inactivity;	
23.	The system shall provide a log of changes to user access rights.	
24.	SSL encryption is based on using the HTTPS protocol, which is implemented for the system. Public-key encryption methods are used as part of SSL encryption;	
25.	Some fields are required (Mandatory) because certain information must be captured in the database. If these fields are not all filled in, the system must reject the form with relevant message. Similarly, data entry checks are configurable within the system. If information is incorrectly entered (for example, numbers are entered where there should only be letters or dates are invalid), the system shall instantly generate a message notifying the user, and the form will not be accepted until the mistake is corrected.	
#	System Audit	
26.	The system shall maintain an audit trail of any changes or updates made in any information that are considered vital and if made should maintain the audit log with information such as <ul style="list-style-type: none"> - Log the users who are accessing the system; - Log the parts of the application that are being accessed; - Log the fields that are being modified; - Log the results of these modifications; - Log attempted breaches of access; - Log attempted breaches of modification rights; - Timestamp. 	

27.	Ensure an audit trail is kept for all transactions and all audit transactions logged are kept on the database.	
28.	Ability to generate system audit reports.	
#	Data Exchange Protocol and Data Exchange Mechanism/System Integration	
29.	Data exchange within the system at different levels via the internet shall be encrypted;	
30.	The system should have a functionality to exchange data with other relevant databases with other external institutions such as: <ul style="list-style-type: none"> • Mobile application database; • Payment service provider's database; • Health MIS; • Tablet application database; • ID card database etc 	
31.	The system should have functionality to export/import files based on the standard template defined through web services and/or API;	
32.	The system should be able to maintain the log of such data imports being performed by the authorized users. The log should maintain information such as: <ul style="list-style-type: none"> ▪ Name of the file exported/imported; ▪ Login ID; ▪ Timestamp; 	
#	User Interface	
33.	The system shall provide intuitive, appropriate interfaces for the different groups of users.	
34.	The system shall provide a user interface which is highly user friendly, easy to navigate and ensure fast loading of interface;	
35.	The system shall include formal and logical error checks and validations to ensure the data integrity and quality;	
36.	It should also have inbuilt facility to send reminders and alerts based on target dates of the user activities;	
37.	The system should have a GUI based interface to create and maintain calculation/validation rules;	
38.	The system should have provision for instructions for data entry, in order to guide users;	
39.	The user interface (labels) should have the functionality for bilingual (Lao and English) and should be user configurable;	
#	MIS Portal	
40.	The system should have a functionality to broadcast general information and announcements using online MIS portal;	
41.	The system should have a functionality to manage the content of the portal displayed for public viewing (content management functionality). For instance, some of the contents may not be for public viewing but for the relevant stakeholders;	
42.	The system shall provide functionality for the industry to apply online application(s) by providing authorized access to the system and allowing them to view/query/search their profile online using his/her secured login ID and password generated by the platform.	

43.	All functions in MIS is accessed using a Single Sign on (SSO) through a common MIS portal. The modules and functions within MIS platform are accessed and navigated based on the user's access rights and control.	
#	Tablet Application using ODK	
44.	An android based application version of MIS platform should be designed, customized or developed and implemented, primarily, for the following function: <ul style="list-style-type: none"> • Onsite registration, enrolment, inspection and compliance functions of the project cycle to enable the staffs to perform data capture, validation and uploading the final data into the centralized MIS platform; • To perform basic search facility on information being captured. 	
45.	Easy and user-friendly installation and configuration in the tablet;	
46.	Seamless integration with the centralized MIS platform for upload/download of relevant data.	
47.	Should have the functionality to re upload/download the data if the event is not successful;	
48.	Should have the functionality to maintain the transaction log as in: <ul style="list-style-type: none"> • Total number of records successful / unsuccessful while uploading to the central server; • Date and timestamp; • Tablet ID; • User ID; 	
49.	Expected key functions: <ul style="list-style-type: none"> • Registration; • Enrolment; • Case Management; • Compliance and Monitoring; 	
#	De duplication	
50.	De-duplication is necessary to mitigate the issues of potential duplicate entries of beneficiaries as the data collection is expected to happen in offline environment through tablets. The system therefore should have a robust means to validate potential data inconsistencies and duplicate and throw exceptions for needful action. The main objective of doing this exercise is to ensure a unique member account that is accurate, complete and reliable;	
51.	Ensure Connect Offline and Connect Online (COCO) Functions that allow data to be entered in the MIS in the offline version and the same shall be shared with the MIS when accessed to the network connectivity;	
52.	Functionality to perform text based de-duplication of registration at the centralized MIS;	
53.	Generate exception reports and result of such de-duplication performed;	
54.	Functionality to track and manage records that have de-duplicated and those that are not;	
#	Email Notification	
55.	The system should have a functionality to trigger email notification as defined in the business rules parameters. For instance, MIS platform should be able to send automatic email notification to the multiple users when following instances occur (for example): <ul style="list-style-type: none"> (i) User is created and approved; 	

	(ii) Password is changed; (iii) OTP; (iv) Payment made to the beneficiaries; (v) Seed Grant disbursed to SHGs, PGs, LIS, etc.; (vi) 100% on time loan repayment achieved by SHGs with name, village, and kumban; (vii) Honorarium paid to Village Youth Facilitators; (v) etc.;	
56.	The content of such email shall be user configurable as per the business need.	
#	Query and Advanced Search	
57.	The system shall provide simple and advanced query and search facilities to all users or the system. The access privileges of user and group the user belongs to must govern the scope of the information permitted by query and limited in the search results.	
58.	The data generated because of selection of such query criteria should be exported to MS-Excel; download and /or print in PDF format.	
#	Sizing, Performance, load testing and Scalability Requirements	
59.	The system shall be capable of handling online and simultaneous transaction, following at minimum: <ul style="list-style-type: none"> • At village level: 200 users (tablets); • At District level: 100 users; • At central level: 30 users • Maintains about One million individual unique accounts (nation-wide); 	
60.	The system processing shall be scalable to support the volume estimates for a period of 10 years at 5% annual growth rate.	
61.	The SI must conduct a load testing taking above factors into consideration and submit a load testing results	
62.	The database architecture should be such that the system is available to users 24 X 7 X 365 days a year near zero down-time	
63.	Page load time, login response-time, 'on-click' load time for the Portal should be less than 3 seconds when the online application is accessed over the Intranet;	
64.	Average transaction response time, 'On-submit' response-time, or any other database access/ search time should be less than 5 seconds when the MIS solution is accessed over the Intranet.	
65.	The solution must support low bandwidth and "near-no" bandwidth conditions for the services defined in the functional requirements.	
66.	The proposed solution should be highly scalable to accommodate current and future requirements within the scope of the current program.	
#	Hardware Requirements	
	During the SRS phase, the Firm is expected to conduct hardware and bandwidth needs assessment for hosting a centralized database. The assessment should be conducted taking into various available options for database hosting with pros and cons of each such option for CLEAR to take a well-informed decision on one of the proposed options. The Firm should submit the Hardware and connectivity needs assessment report for CLEAR approval.	

67.	<p>Each of the proposed options shall cover the following:</p> <ul style="list-style-type: none"> - Most optimal hardware design architecture with optimal backup provisioning; - List of hardware to be procured and their full specifications, bills of quantity; - Cost implication projection for minimum 5 years period for each option; - Internet bandwidth requirements for the end users and at the data center; - Applicable RDMBS and/or third-party licenses, if any <p>Note: Based on the approved option, hardware architecture, specifications and Bills of Quantity, CLEAR will procure the equipment under a separate package.</p>	
68.	The Firm is expected to collaborate and work closely with the hardware vendor to ensure a proper hardware implementation, system deployment.	
69.	<p>The Firm shall certify that all hardware procured are in compliance with the developed specifications and submit a full hardware review report.</p> <p><i>Note: The winner of this contract (the Firm and their associates) shall not be allowed to bid for the hardware package.</i></p>	
#	SMS Integration	
70.	The system should have a functionality to broadcast and manage SMS services to the eligible beneficiaries based on the program business rules and criteria (SMS management module)	
71.	The SMS module should be designed, developed and integrated with the MIS for seamless data exchange for SMS broadcasting. The cost of the SMS shall be borne by the project.	
72.	The Firm shall identify all the hardware and IT equipment necessary (such as SMS gateway) for implementing this solution. Such hardware and IT equipment shall be identified, proposed in the Hardware need assessment.	
#	Data Backup and Recovery	
73.	The backup and restoration plan should be developed and implemented;	
74.	The Firm shall be responsible for monitoring data backups in accordance with the backup plan developed during the warranty period;	
75.	Shall implement the required backup solution for real time / scheduled /automatic backups which should be monitored and reported;	
76.	Must implement data recovery mechanism in case of database failover;	
#	Technology Platform	
77.	Should be developed using Open-Source technology standards such as PHP/JAVA, MySQL, SQL lite combination;	
78.	Open Data Kit (ODK) for mobile application development;	
#	Electronic Document Management and tracking	
79.	The system should have a functionality to upload scanned images and maintain the history for future retrieval. For instance, the user should be able to upload scanned copy of the supporting document;	
80.	Such documents/images to be uploaded should have user definable document category, for instance, scanned photograph, financial statement, application form etc;	
81.	The system shall allow the user to enter specific supporting details like attaching documents at all levels.	
82.	Scanned images could be in the form of PDF, word, Excel, JPG files;	

83.	The maximum file size to be uploaded shall be user definable and validated in order to restrict large file sizes upload.	
#	Online Help	
84.	The System should include an online help. This help would be in accessible directly from every part of the user interface.	
85.	The help provided will be dynamic and contextual depending on the where or which process the user is present. Online help may in the form of a process guide, tool tips or even sample data.	
#	Data Migration and Backlog Data Entry	
86.	Supply of data entry operators or project staff for Backlog data entry	
87.	Electronic data migration related to project;	
#	Exception Handling	
88.	The system should throw appropriate alert or error messages when exceptions are discovered which impacts the data integrity. For instance, the appropriate validations should error/exception if: - <ul style="list-style-type: none"> - Blank value/data is passed where mandatory; - Invalid date format is entered and/or does not fall between the acceptable data range; - Contribution amount entered does not fall in the given range; - Invalid Unique Identifier; - Invalid code is entered; - Duplicate entries detected - etc. 	
89.	The system should throw appropriate alert or error messages when exceptions to the contribution recoding are discovered. In this case, the system should revoke all the transactions made. Such validations should be based on, not limiting to: - <ul style="list-style-type: none"> - Employee/employer contribution amount - Compare with previous contribution amount etc. 	
#	System and Source Code Ownership requirements	
90.	CLEAR will be the full owner of the MIS Platform without any preconditions or whatever.	
91.	The Firm shall handover all the source code and technical documentation of the system without any preconditions.	
92.	For any other proprietary third-party software used (besides RDBMS), the Firm shall provide perpetual and valid license for at least period of 3 (three) years.	
93.	The Firm to clearly mention the list of such proprietary third-party software to be provided.	

7. Tentative implementation schedule

#	Activities	M1	M2	M3	M4	M5	M6	M7	M8 - M45
		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May2025 - Jun2028
1	Project Mobilisation/Inception								
2	Produce a comprehensive System Requirement Specifications Document (SRSD) including hardware needs assessment report for review and approval								

3	SRSD Revi2w and Approval								
4	MIS System Design								
5	System Design Document (SDD) submission review and approval								
6	MIS platform development (including tablet application) as per the agreed SDD								
7	System prototypes								
8	System installation configuration @ data center								
9	System training and testing								
10	Handover of key deliverables and Issuance of Operational Acceptance Certificate								
11	Go Live								
12	System warranty and maintenance support services								