



RECOVERY OF ECONOMIC ACTIVITY FOR LIBERIAN INFORMAL SECTOR EMPLOYMENT (REALISE) PROJECT

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TERMS OF REFERENCE (TOR)

Social Registry and Management Information Systems Enhancement

1. Background

The Government of Liberia has received funding from the World Bank, Swedish International Development Association (Sida), and the French Agency for Development (AFD) to implement the Recovery of Economic Activity for Liberian Informal Sector Employment (REALISE) Project. The Project Development Objective is to increase access to income-earning opportunities for the vulnerable in the informal sector in response to crises, expand income and livelihood support to poor and food-insecure households, and improve efficiency in managing social protection programs in Liberia. The REALISE project comprises six components namely: (i) Grant Support to Vulnerable Households to Revive or Start Small Businesses; (ii) Temporary Employment Support and Employability Development for Vulnerable Workers, (iii) Program Implementation, Capacity Building, and Coordination; (iv) Contingency Emergency Response Component (v) Community Livelihood and Agriculture Support, and (vi) Social Cash Transfer and Strengthening of the National Social Protection System. The REALISE Project is being implemented by the Ministry of Youth and Sports (MYS), the Ministry of Gender, Children, and Social Protection (MGCSP), and the Liberia Agency for Community Empowerment (LACE). Implementation of project activities is managed by a single Project Management Team (PMT) that sits outside of the implementing institutions and is comprised of consultants hired by the three institutions. The Ministry of Youth and Sports is responsible for the overall coordination of the Project.

Since the system was constructed, technology has evolved significantly. Advances in big data analytics, machine learning, and artificial intelligence now offer new opportunities to improve targeting accuracy, system performance, interoperability, and policy impact. These advances are necessary to fully utilize the public investments already made in the social registry.

The existing system is technically bulky, slow in response time, and has experienced recurring bugs and operational failures. These limitations constrain real-time decision making, scale-up, and sustainability. A structured upgrade and long-term maintenance arrangement is therefore required.

2. Purpose of the Assignment

The purpose of this assignment is to upgrade, optimize, and provide ongoing maintenance for the Liberia Household Social Registry and its Management Information System to ensure efficiency, scalability, security, and advanced analytical capability.

2.1. Definition of Key Technical Terms

For the purpose of this TOR, the following terms shall have the meanings defined below:

2.1.1. Optimize / Optimization

In the context of the REALISE Social Registry and MIS, optimization refers to

measurable improvements in system performance and resource efficiency, including but not limited to:

- Reduction in database query execution time
- Reduction in average system response time
- Elimination of redundant processing logic
- Improved indexing and caching mechanisms
- Reduction of system error rates

Optimization must be demonstrated through benchmark testing conducted before and after implementation.

2.1.2. **Streamline / Streamlining**

Streamlining refers to the restructuring of workflows, database schemas, or system modules to eliminate duplication, remove unnecessary steps, and reduce complexity in system operations. This includes:

- Removal of redundant data fields or tables
- Reduction in the number of steps required to complete core administrative actions
- Simplification of system architecture while maintaining functionality

2.1.3. **Modernize / Modernization**

Modernization refers to updating legacy components of the MIS to align with current best practices in system architecture and data management, including:

- Introduction of modular architecture
- Implementation of documented API layers
- Adoption of standardized data exchange formats
- Replacement of unsupported or unstable components

Modernization does not imply full replacement unless explicitly approved.

2.1.4. **Scalable / Scalability**

Scalability refers to the ability of the system to support increased user load, additional program modules, and expanded datasets without degradation in performance or requiring a full architectural rebuild.

2.1.5. **Enhance / Enhancement**

Enhancement refers to the addition of clearly defined new functionalities or improvements to existing functionalities, which must be testable during User Acceptance Testing (UAT).

2.1.6. **Advanced Analytics**

Advanced analytics refers to configurable reporting tools and dashboards that allow administrators to:

- Filter beneficiary data by geography, demographics, program, and vulnerability category
- Conduct time-series trend analysis
- Export datasets in standard formats

This does not include development of full predictive machine learning models unless otherwise specified.

2.1.7. **Interoperability**

Interoperability refers to the system's ability to exchange data securely with specified government systems using defined API endpoints, structured data formats (e.g., JSON, XML), and authentication protocols.

2.1.8. Technical Debt

Technical debt refers to legacy design choices, redundant code, undocumented logic, or architecture limitations that increase maintenance burden or degrade system performance.

3. System Constraints and Technical Parameters

To ensure comparability of bids and continuity of public investment, the following technical constraints shall apply:

- The existing Social Registry and MIS core system shall be retained and optimized. Full system replacement is not permitted unless explicitly justified through the system assessment and formally approved in writing by the Ministry.
- The consultant shall prioritize refactoring, modularization, performance optimization, and architectural streamlining over wholesale redevelopment.
- Any modernization of the system architecture must ensure backward compatibility with existing data structures unless an approved migration plan is submitted and validated.
- Hosting environment constraints (cloud or on-premise) shall remain consistent with current Government-approved infrastructure. Any proposed changes to hosting configuration must include cost implications, security implications, and migration risk assessment.
- The consultant shall document the existing technology stack and identify areas where modernization can occur without disrupting operational continuity.
- Proprietary lock-in architectures are not permitted unless justified and approved. Preference shall be given to open standards, open APIs, and portable infrastructure configurations.

4. Objectives

The specific objectives are:

- Improve system performance, speed, and reliability
- Reduce system complexity and technical debt
- Integrate modern data management, analytics, and a modular architecture capable of supporting configurable scoring models and trend analysis
- Strengthen targeting accuracy and poverty analysis
- Ensure interoperability with national and sectoral systems
- Establish a sustainable maintenance and capacity transfer framework

5. Scope of Work

The consultant or firm will undertake the following tasks.

5.1. System Assessment and Redesign

- Conduct a full technical and functional assessment of the existing social registry and MIS
- Review system architecture, database structure, source code, hosting environment, and security controls
- Identify performance bottlenecks, bugs, and structural weaknesses
- Propose a streamlined, modular, and scalable system architecture

5.2. System Upgrade and Optimization

- Redesign and optimize system architecture for speed and scalability
- Modernize databases and data pipelines to support large-scale analytics
- Resolve critical bugs and systemic issues
- Improve user interface and user experience for administrators and field users
- Ensure mobile and offline data collection efficiency
- Conduct User Acceptance Testing (UAT) with Ministry-designated end users prior to system go-live, including preparation of structured test plans, execution of test scenarios across all core modules, documentation of defects, resolution verification, and formal UAT sign-off by the Ministry

5.3. Advanced Analytics and Intelligence

- Refactor the database schema and API layer to support batch processing of household data against the Proxy Means Test formula, and to allow integration of updated scoring coefficients without requiring system redevelopment
- Develop a configurable, rules-based Proxy Means Test scoring engine that can be updated when coefficients change, with a defined interface for future model integration as a modular component (full machine learning model development is out of scope for this contract)
- Develop dashboards that surface trend analysis on program beneficiary data by geography, gender, and vulnerability category, and support scenario analysis for shock-responsive social protection planning
- Support data export and reporting in standard formats (CSV, Excel, PDF) to enable policy makers to conduct their own analysis outside the system

5.4. Proxy Means Test and Data Standards

- Strengthen implementation of proxy means test methodologies within the system
- Standardize data collection instruments and protocols across programs
- Ensure data quality controls, validation rules, and audit trails

5.5. Interoperability and Integration

- Enable secure interoperability with other government systems such as civil registration, payments, and sectoral MIS platforms (mandatory integrations and applicable data exchange standards to be specified by the Ministry before procurement)
- Adopt national and international data exchange standards
- Ensure compliance with data protection and privacy requirements

5.6. Maintenance and Support

The consultant shall provide ongoing system maintenance and support for at least one year under the following minimum Service Level Agreement (SLA) thresholds:

- Critical Issues (System Down / Data Loss Risk)
 - Acknowledge within 4 hours.
 - Resolution or mitigation within 24 hours.
- Major Issues (Core Function Impaired but System Operational)
 - Acknowledge within 1 business day.

- Resolution within 3 business days.
- Minor Issues (UI errors, non-critical bugs, cosmetic fixes)
 - Acknowledge within 2 business days.
 - Resolution within 10 business days or next scheduled release cycle.
- Provide monthly system health reports summarizing uptime, incidents, patches applied, and performance metrics.
- Maintain a version control log documenting all system modifications.

5.7. Capacity Building and Knowledge Transfer

- Develop role-specific training manuals and technical guides, including: a system administrator guide, a data analyst guide, and a field supervisor guide covering common data collection issues and form logic troubleshooting
- Conduct a mid-contract knowledge transfer checkpoint (end of Phase 1) at which designated Ministry technical staff must demonstrate the ability to perform defined system administration tasks independently before Phase 2 commences
- Provide clear handover documentation, technical manuals, and at least one training session covering low-cost system adjustments (configuration changes, form updates, basic database queries) to enable sustainability at lower cost after contract close

5.8. Survey and Data Collection Module Redesign

- Assess the current survey design module, documenting failure points, data loss incidents, and known logic errors
- Redesign the survey design interface using open-source, XLSForm-compatible standards (e.g., ODK or KoboToolbox-style form building) with built-in validation logic and skip logic
- Ensure offline data collection capability with automatic synchronization on reconnection, applicable to the Liberia Household Social Registry (LHSR) data collection and other Ministry M&E tools including post-distribution monitoring

5.9. Data Quality, Currency, and Deduplication

- Implement a system-wide data freshness flag that marks records not updated within a defined threshold (e.g., five or more years) and surfaces these on administrator dashboards for follow-up
- Develop automated deduplication logic including: duplicate record matching on key identifiers (name, national ID, geography) and image-based duplicate detection using perceptual hashing for beneficiary photographs
- Conduct a targeted GRM data audit flagging logical inconsistency (e.g., beneficiaries recorded as 100 years or older, duplicate case identifiers) and produce a remediation report

6. Deliverables

Key deliverables will include:

- Inception report and system assessment report
- Detailed upgrade and redesign plan
- Upgraded and optimized social registry and MIS
- User Acceptance Testing (UAT) report, including test plans, test cases, results, issue log, and sign-off documentation from designated Ministry stakeholders

- Advanced dashboards and analytical tools
- Standardized data collection instruments and Proxy Means Test scoring module
- Maintenance and support plan
- Training reports and manuals (role-specific guides for administrators, analysts, and field supervisors)
- Redesigned survey and data collection module with ODK-compatible form builder
- Data quality and deduplication report with GRM audit findings and remediation actions

7. Duration

The assignment is structured in two phases over a total period of eight months.

- Phase 1 (Months 1–4): System Assessment, Core Stabilization, and Survey Module Redesign – covering Sections 5.1, 5.2, 5.4, 5.8, and 5.9, with a knowledge transfer checkpoint at the end of Month 4.
- Phase 2 (Months 5–8): Advanced Analytics, Interoperability, Capacity Building, and Ongoing Support – covering Sections 5.3, 5.5, 5.6, and 5.7. The exact start date and phasing milestones will be confirmed during contract negotiations.
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8. Institutional Arrangements

The consultant will work under the overall supervision of the Ministry of Gender, Children and Social Protection, in coordination with the REALISE Project and relevant government stakeholders.

9. Required Qualifications

Management Staff Qualifications:

- Team Lead/Project Manager: Minimum 10 years of experience in MIS or social registry projects
- Key Technical Staff: Database Administrator (5+ years), Software Developer/Programmer (5+ years)

The firm or consortium should demonstrate:

- At least 5 years of proven experience in large-scale social registries or national MIS platforms
- At least 3 years of demonstrated expertise in data engineering, system optimization, and cloud architecture
- Experience with big data analytics (e.g., Apache Spark, Hadoop), configurable scoring models, or AI-enabled systems in a government or social protection context
- Prior work with government or development partners in similar contexts
- Capacity for system maintenance and support
- At least one staff member with demonstrated experience in data protection compliance, data governance frameworks, and cybersecurity best practices for government systems handling sensitive personal data
- Demonstrated UX design capability for low-literacy and low-bandwidth field users, evidenced by portfolio examples from comparable deployments
- Experience with DevOps practices including CI/CD pipelines, containerization, and system monitoring tools to ensure reliable deployments and ongoing system stability

10. Payment Schedule and Milestone-Linked Disbursement

Payments under this contract shall be made upon satisfactory completion and formal acceptance of defined deliverables by the Ministry of Gender, Children and Social Protection. Payments are linked to key milestones aligned with the two implementation phases of the assignment. All deliverables must be submitted for review and formally approved before payment is authorized.

MILESTONE	DELIVERABLES	TIMELINE	PAYMENT %
MILESTONE 1: INCEPTION AND SYSTEM ASSESSMENT	<ul style="list-style-type: none"> • Inception report including detailed workplan and methodology. • Comprehensive technical and functional assessment of the existing Social Registry and MIS. • Review of system architecture, database structure, and hosting environment. • Identification of system bottlenecks, bugs, and technical debt. 	Month 1	20%
MILESTONE 2: SYSTEM UPGRADE AND CORE STABILIZATION	<ul style="list-style-type: none"> • Detailed system upgrade and redesign plan. • Refactored and optimized system architecture for speed and scalability. • Resolution of major system bugs and stability issues. • Redesigned survey and data collection module with XLSForm/ODK compatibility. • Mid-phase knowledge transfer checkpoint. 	Month 4	30%
MILESTONE 3: ADVANCED ENHANCEMENTS AND INTEGRATION	<ul style="list-style-type: none"> • Configurable Proxy Means Test (PMT) scoring engine. 	Month 6	30%

	<ul style="list-style-type: none"> • Advanced analytics dashboards and reporting tools. • Standardized data collection instruments and protocols. • Interoperability API layer and integration with designated systems. • Automated deduplication tools and data quality improvements.
<p>MILESTONE 4: UAT, DEPLOYMENT, AND HANDOVER</p>	<ul style="list-style-type: none"> • User Acceptance Testing (UAT) report including test cases and verification of fixes. Month 8 20% • Formal UAT sign-off by the Ministry. • Final system deployment and operationalization. • Role-specific training manuals and technical documentation. • Final capacity building sessions and knowledge transfer. • Maintenance and support plan (1-year SLA).

Payment Conditions

- All milestone payments are contingent upon formal acceptance of deliverables by the Ministry.
- Where revisions are required, payment will be released only after satisfactory corrections are completed.
- The final payment shall be made after confirmation of successful system deployment and completion of all knowledge transfer activities.

11. Reporting

All reports and deliverables will be submitted to the Ministry of Gender, Children, and Social Protection according to an agreed reporting schedule.

12. Annex 1: Systems Definition and Technical Baseline

12.1. System Overview

The Liberia Household Social Registry and associated Management Information System constitute the core digital infrastructure supporting social protection programs under the REALISE Project. The systems support beneficiary registration, poverty targeting, enrollment, payments monitoring, grievance redress, and reporting.

The MIS and the Social Registry Information System operate as interlinked but distinct platforms with separate application layers and databases.

12.2. Technology Stack

12.2.1. Management Information System

	LANGUAGE/PROGRAM
BACKEND LANGUAGE	C#
BACKEND FRAMEWORK	ASP.NET
DATABASE ENGINE	PostgreSQL
MOBILE APPLICATION FRAMEWORK	Java using Android Studio
VERSION CONTROL	No formal version control repository is currently implemented

11.2.2. Social Registry Information System

	LANGUAGE/PROGRAM
BACKEND LANGUAGE	Java
BACKEND FRAMEWORK	OSGi Liferay Portal
DATABASE ENGINE	PostgreSQL
MOBILE APPLICATION FRAMEWORK	Java using Android Studio
VERSION CONTROL	No formal version control repository is currently implemented

12.3. Requirement

The existing core technology stack shall be retained and optimized.

Proposals must demonstrate compatibility with C#, ASP.NET, Java frameworks, and PostgreSQL unless a formally approved migration plan is submitted and validated by the Ministry.

12.4. System Scale and Baseline Metrics

Total number of households in the LHSR database	479,905
Total number of individual records	1,494,309

Total active programs in the MIS	4
SRIS Current database size	145 GB
MIS Current database size	28 GB
SRIS Staging	52 GB
MIS Staging	894 MB

These baseline metrics shall be used to benchmark measurable performance improvements following system optimization.

12.5. Code Ownership and Intellectual Property

Confirmation of Government ownership of the full source code	Confirmed
Availability and status of system documentation	Available
Any proprietary libraries or dependencies linked to the original developer	NA

All enhancements developed under this contract shall become the property of the Government of Liberia. No proprietary lock-in architecture is permitted without written approval.

12.6. Environment Structure

Separate environments	Staging and Production confirmed
Dedicated Development environment	To be assessed during inception
CI/CD pipeline	Not currently implemented
Deployment model	Manual deployments

The consultant shall assess and recommend structured environment segregation and, where feasible, introduce:

- A formal Development, Testing, and Production structure
- A version control repository
- Automated deployment and rollback procedures

12.7. Backup and Disaster Recovery

Backup Frequency	Event-driven (Incremental)
Backup storage location	Cloud and on premise (NAS)
Recovery Time Objective	RTO: 4 to 24 hours
Recovery Point Objective	RPO 1-15 minutes

The consultant shall validate backup integrity and recommend improvements to ensure compliance with defined recovery thresholds.

12.8. Proxy Means Test and Targeting Engine

Editable scoring formulas through configuration	Confirmed
Recalibration without code modification	Not confirmed

The upgraded system must include:

- A configurable rules-based scoring engine
- Editable coefficient configuration layer
- Recalibration capability without recompilation
- Audit logging of formula and coefficient changes

12.9. Survey Tool Architecture

Current structure	Custom-built survey module
Documented failure points	Client-side and server-side logic errors

The consultant shall:

- Document known logic failures
- Redesign survey architecture using XLSForm-compatible standards
- Ensure offline data collection with automatic synchronization
- Strengthen validation and skip logic controls

12.10. Performance Benchmarking Requirements

At inception, the consultant shall document:

- Average system response time
- Database query execution time
- System error rate
- Concurrent user capacity

Post-optimization, the consultant must demonstrate measurable improvement in:

- Query execution time
- System load handling
- Error reduction
- Administrative workflow efficiency

12.11. Interoperability Baseline

The systems currently operate on PostgreSQL databases with C# and Java-based backend services. API documentation status shall be reviewed during inception.

Future integrations may include:

- Civil registration systems (e.g., National Identification Registry)
- Payments platforms
- Sectoral management information systems

All interoperability must use secure API endpoints and structured formats such as JSON or XML with defined authentication protocols.

12.12. Security Baseline

The consultant shall assess and document:

- User role hierarchy and access controls
- Data encryption at rest and in transit
- Audit logging mechanisms

- Vulnerability exposure points

All enhancements must align with national data governance standards and World Bank data protection principles.

12.13. Binding Technical Constraints

The following constraints apply to this assignment:

- The core system architecture shall be retained and optimized.
- Full system replacement is not permitted without written approval.
- Backward compatibility must be maintained unless an approved migration plan is validated.
- Hosting must remain consistent with Government-approved infrastructure unless a costed and risk-assessed alternative is submitted.