



Resilient African Feed and Fodder Systems Project (RAFFS)

Terms of Reference (ToR)

Development of Integrated Feed and Fodder Management Information System (IFFMIS)

I. Background

The African Union InterAfrican Bureau for Animal Resources (AU-IBAR) is a specialized technical Office of the Department of Agriculture, Rural Development, Blue Economy and Sustainable Environment (DARBE) of the African Union Commission (AUC). AU-IBAR's mandate is to support and coordinate the utilization of livestock, fisheries and wildlife as a resource for both human wellbeing and economic development in the Member States of the African Union (AU) and Regional Economic Communities (RECs).

AU-IBAR and the Bill & Melinda Gates Foundation (BMGF) are collaborating in the implementation of an action: “Evidence Driven Short Term Solutions to Build Resilience and Address the Adverse Effects of Crises on African Feed and Fodder Systems” commonly referred to as the ‘Resilient African Feed and Fodder Systems Project’ (RAFFS Project). This emergency and short-term action will contribute to understanding the effect of recent and on-going global crises (3Cs: COVID-19, Climate Change shocks and the Conflict between Russia and Ukraine) on the African feed and fodder supply chain and subsequently their effects on the Livestock Sourced Foods (LSFs). This will generate evidence base critical to shaping coordinated action to respond to the feed and fodder shortages that have led to huge losses of livestock (e.g., over 9.5 million livestock in the Greater Horn of Africa region alone), eroded livelihoods, loss of incomes, and driven up prices of highly nutritive livestock-sourced foods making them inaccessible to sections of the population that need them most.

Feed constitutes 60 – 70% of the total cost of animal production: the crises have exposed significant weaknesses and vulnerabilities in the African feed and fodder input and supply chains. Addressing feed and fodder shortages in the short-term ensures business continuity and sustainable livelihoods. The multiplicity and increasing frequency and severity of shocks and their complex and interlocking effects demand an approach that will also strengthen resilience in feed and fodder systems.

The action proposes strengthening analytical capacity for evidence-based decision-making and attracting investment, identifying and upscaling viable existing approaches and innovative models, and harnessing partnerships for coordinated action to galvanize impactful immediate and short-term investments. Women, who are largely rural-based or in the informal sector, are disproportionately poor and vulnerable to the increased prices and unavailability of livestock-sourced foods. Working through the African Women in Animal Resources Farming and Agribusiness Network, established under the ambit of AU-IBAR, the action proposes interventions to ensure women’s meaningful involvement in gainful activities in the feed and fodder and livestock-sourced foods supply chains.

To respond to the crisis, the AU-IBAR, through the RAFFS Project, supported by the Bill & Melinda Gates Foundation, seeks to address critical weaknesses in the feed and fodder supply chain, catalyzing investments through data-driven and evidence-based systems. The Project intends to apply a portion of the financing to procure services of a consultant for the design, development and service integration of an Integrated Feed and Fodder Management Information System (IFFMIS). The IFFMIS will be a digital platform implemented at the national level to streamline feed and fodder data collection, storage, analysis, and dissemination. The platform

will support stakeholders in tracking feed and fodder availability, quality, production trends, and policy interventions.

2. Objectives of the Consultancy

The primary objective of this assignment is to engage a qualified Agri-tech firm (hereafter referred to as the Consultant) to design, develop, and implement a secure, scalable, and user-friendly Integrated Feed and Fodder Management Information System (IFFMIS) at a national level. The system will function as a centralized, integrated platform that provides real-time, reliable data to enhance decision-making, optimize resources, and improve coordination among key stakeholders in the feed and fodder value chain.

The consultancy will be guided by the following specific objectives:

- Develop a centralized, user-friendly digital platform for feed and fodder data management.
- Ensure the integration of the platform with existing databases and national information systems to promote data sharing across stakeholders.
- Incorporate features for data visualization, including dashboards and reports for monitoring feed resources.
- Enable real-time data access and reporting on feed availability, demand, prices, and trends.
- Train relevant personnel on the use and maintenance of the platform to ensure long-term sustainability.

3. Scope of Work

The consultancy will be tasked with the full development and implementation of the IFFMIS platform, ensuring alignment with national requirements and stakeholder expectations. Key responsibilities include, but are not limited to;

3.1 Conduct a Comprehensive Documents Review.

- (i) Analyze country assessment reports, data management guidelines, and reports to design country-specific data management infrastructure and integration plans for the feed and fodder supply chain across the six RAFFS project countries.
- (ii) Determine the technical, functional, and user requirements for the platform.
- (iii) Develop a detailed System Requirements Specification (SRS) document for review and approval, providing the blueprint for the system's design and development.

The consultant is expected to conduct a thorough review of relevant documents, including country assessment reports, data management guidelines, and existing infrastructure evaluations, to align the IFFMIS platform with national requirements. This review will ensure that the platform addresses country-specific institutional mandates, data flow structures, and digital capacities within the feed and fodder sector. The consultant must analyze existing processes, identify gaps, and propose solutions for streamlined integration. Furthermore, the consultant will recommend scalable infrastructure options and work closely with stakeholders to perform gap analyses and facilitate collaborative planning for effective implementation.

Outcome

The outcome of the above task is a comprehensive System Requirements Specification (SRS) document that reflects the unique needs of each RAFFS country. This document will provide a detailed blueprint for the IFFMIS platform, ensuring it aligns with institutional mandates, national

feed and fodder data structures, and digital capacities. The Consultant must submit review documentations and submit the signed approval copy of this document as final.

3.2 System Design

As the SRS document is approved, the Consultant is expected to conduct the System Design of the IFFMIS Platform into consideration. While doing so, the Consultant is expected to document the underlying database structure and reflect both backend architecture and front-end interface design functionalities. The System Design Document should also reflect the table definitions and overall database model of IFFMIS that this document could use as future reference if needed.

Outcome

The outcome of this activity should be a comprehensive System Design (SD) document on approved SRS. The Consultant must submit the review document for final approval by AU-IBAR Approving Team.

3.3 Development of the Platform, Configuration and Prototyping

The Consultant is expected to develop the system based on the agreed Software Requirements Specification (SRS) and System Design (SD) using the proposed technology framework. The Consultant should adopt an agile development approach, enabling continuous tracking of progress throughout the development period. The system should be demonstrated to stakeholders at regular intervals to ensure that development efforts are progressing satisfactorily and align with expectations.

Outcome

The outcome of this activity is iterative prototyping progress on application to review and provide quick comments on progress that is made until the prototype is acceptable by RAFFS Project and country expert teams.

3.4 System Installation and Configuration

This activity involves the installation and configuration of the system on the hardware allocated for IFFMIS hosting, based on the recommendations from the country specific hardware assessment. The Consultant will be responsible for installing and configuring the system on the designated IFFMIS hardware, working closely with the infrastructure service provider to ensure seamless deployment. Additionally, the Consultant will deploy a staging platform to test newly adopted functionalities, ensuring compatibility and stability within the production environment.

Outcomes

- System installation report
- Staging Platform Details

3.5 Data Migration & Entry

The consultant, in collaboration with country experts, will ensure that existing datasets are effectively migrated or updated within the new IFFMIS platform during the testing and implementation phases. This includes evaluating data structures, formats, and migration processes to ensure compatibility with the new platform. Data migration will occur in multiple stages—

initial migration for system testing and validation, followed by a final migration during the Go Live phase.

Outcomes

- Assessment of existing data formats and structures.
- Development of data migration tools and utilities.
- Integration of tools for bulk data migration.
- Finalization of a comprehensive data migration strategy.
- Execution of the final data migration during Go Live.
- Validation and verification of migrated data for accuracy and completeness.

3.6 IFFMIS Platform User Training

Comprehensive training is essential to ensure users can effectively operate the IFFMIS platform at various levels. The consultant will design and execute a training program to equip staff across national and project offices with the necessary skills for independent use and management of the system.

Key Tasks;

- Draft a detailed training plan for approval by the RAFFS Project team.
- Train government staff, feed and fodder actors, and data collectors on platform usage, data entry, and reporting processes.
- Train technical staff on system administration, database management, and troubleshooting.
- Adopt a "Train the Trainer" (ToT) approach to build in-house capacity for future training.
- Provide training materials, audio-visual aids, and bilingual (English and French) manuals.

Outcomes

- Training Plan Finalized and approved by the RAFFS Project Team.
- Preparation and distribution of manuals and audiovisual resources.
- Successful delivery to users and administrators.
- Collect and assess participant feedback to ensure continuous improvement.
- Build capacity for ongoing training through the ToT approach.

3.7 Operational Acceptance

Operational acceptance is a critical step in finalizing the implementation of the IFFMIS platform. The consultant will ensure the platform's readiness by completing both functional and non-functional activities to enable smooth operations. A User Acceptance Test (UAT) will be conducted with trained users to validate the platform's functionality and confirm the success of data migration efforts. Upon successful UAT, the system will proceed to full implementation. Operational acceptance will also mark the beginning of the warranty period.

Outcomes

- Collect feedback, address bugs, and perform necessary fixes.
- Define and confirm operational acceptance criteria.
- Obtain final approval to proceed with system rollout.

3.8 Final Deployment (Go Live) of IFFMIS

The final deployment of the IFFMIS platform will commence once operational acceptance is achieved and the final data migration is successfully completed. At this stage, countries and stakeholders will integrate the platform into their daily operations for feed and fodder management. The consultant will provide technical guidance throughout the deployment to ensure smooth implementation.

Outcome

- Authorized users fully adopt the IFFMIS for daily operations.
- Technical support ensures smooth transition and functionality to the new system.

3.9 Implementation Support Service

During the project period, the consultant will offer comprehensive implementation support to handle issues such as bugs, functional requests, and system errors. The warranty period will cover minor enhancements, feature additions, and report customization based on user needs. Any larger changes outside the agreed scope will require additional efforts defined mutually between the project and consultant. The consultant will also help build the country's internal technical capacity to independently manage and sustain the platform.

Outcome

- Timely resolution of bugs, deployment of upgrades, and error management.
- Training admin users to independently manage system maintenance and modifications.
- Establish robust backup mechanisms to prevent data loss.
- Provide in-depth support during data migration and regular system operations.
- Ensure smooth system operations with ongoing monitoring and incremental backups.
- Transfer knowledge to ensure national experts can manage the platform post-deployment.

4. Functional and Technical Requirements

| Category | Module | Functional Requirements | Technical Requirements |
|------------------------------------|-------------------------|--|--|
| I. Feed Production | Production Management | Capture data by feed type (silage, hay, concentrates, etc.). Track seasonal production trends across regions. Include GIS-based mapping to visualize production areas. | Backend database for capturing production data. Integration with GIS tools for spatial mapping. |
| | Crop Residue Management | Monitor utilization of crop residues as animal feed. Track waste management and recycling for sustainability reports. | Real-time database updates with predictive analytics. Mobile app for farm-level residue data collection. |
| 2. Market Monitoring & Feed Prices | Market Price Tracker | Track prices at national and regional levels for each feed type (wholesale/retail). Monitor trends and identify price fluctuations. | Web-based dashboard displaying price trends. Integration with external market databases via API. |

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|----------------------------------|---------------------------|--|--|
| | Supplier Directory | Maintain a list of verified suppliers, wholesalers, and distributors. Track feed product availability. | Central supplier database with search and filter functions. |
| 3. Feed Inventory & Supply Chain | Stock Management | Monitor feed availability by type, quantity, and location. Provide alerts for low inventory levels. | Real-time synchronization of inventory data. Automated alerts via email/SMS. |
| | Import/Export Tracking | Capture import/export transactions for feed products. Monitor regulatory compliance for trade. | Integration with customs and trade platforms. Export/import report generation. |
| 4. Policy Management & Reporting | Policy Data Repository | Store and manage policy documents related to feed and fodder systems. Track policy actions and implementation. | Role-based access for policymakers. Automated policy status tracking. |
| | Compliance Monitoring | Monitor compliance with regulations across stakeholders. Generate compliance status reports. | Real-time compliance monitoring integrated with government systems. |
| 5. Data Collection & Integration | Mobile App for Data Entry | Enable offline data collection for field agents. Capture multimedia data (photos, GPS) to enhance data quality. | Offline data synchronization with the backend when internet is restored. Mobile app for Android and iOS. |
| | Data Integration Module | Ensure data sharing between government and regional platforms. Integrate data formats (JSON/XML). | API-based data sharing with external platforms. Support for standardized protocols. |
| 6. Dashboard & Reporting Tools | Dashboard Module | Present indicators on feed availability, market prices, production trends, and inventory levels. Generate interactive visualizations (charts, graphs, maps). | Web-based interactive dashboard with export options (PDF, Excel). Real-time data sync with backend. |
| | Automated Reporting | Generate customized reports based on user requirements. Provide automated email reports for stakeholders. | Report scheduling functionality. PDF/Excel export integration. |
| 7. User Management & Security | User Role Management | Assign roles (e.g., administrator, data entry, policy analyst) with different access levels. Monitor user activity and maintain an audit trail. | Role-based access control (RBAC). OAuth2/SSO integration for secure login. |
| | Security Module | Ensure data encryption and 2-factor authentication (2FA). Conduct regular security audits. | SSL/TLS encryption. Data encryption, GDPR compliance, Compliance with data protection regulations. |

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|---------------------------------------|------------------------------------|--|---|
| | Multi-Language Support & Usability | Provide bilingual support in English and French for all user interfaces, reports, dashboards, and notifications, with easy language-switching functionality. | Use localized content files for seamless language switching and ensure all components—dashboards, alerts, and messages—adapt accurately across both languages. Maintain consistency with thorough quality checks. |
| 8. Capacity Building & Training | User Training Module | Conduct user training sessions for various roles (system admins, field agents). Provide multilingual training materials. | LMS integration for tracking training progress. Built-in help and FAQs within the platform. |
| | Technical Training | Train system administrators on platform maintenance and data backup. | Virtual and in-person training options. Technical documentation provided. |
| 9. System Monitoring & Maintenance | Monitoring Dashboard | Track system health, usage statistics, and performance. Provide uptime reports and alerts. | Cloud infrastructure monitoring tools. Automated alerts via email/SMS. |
| | Backup & Recovery | Implement incremental and full backups to ensure data availability. Provide disaster recovery options. | Cloud-based backup storage with recovery tools. Auto-sync between primary and backup servers. |
| 10. Data Analytics & Forecasting | Predictive Analytics Module | Analyze historical data to predict future trends (e.g., feed demand). Generate early warning alerts for potential shortages. | Integration with machine learning models for forecasting. |
| | Data Visualization Tools | Provide dynamic charts, graphs, and maps to display trends and key metrics. | Support for D3.js or Chart.js libraries. Real-time visual updates. |
| 11. Integration with IoT Systems | IoT Data Capture | Connect with IoT devices (e.g., smart sensors for monitoring feed quality). Collect real-time environmental data. | Integration with IoT platforms using MQTT protocols. |
| 12. Hardware & Infrastructure Support | Server Infrastructure | Deploy on cloud or hybrid infrastructure with failover support. Ensure high availability (99.9% uptime). | Cloud hosting with load balancing and failover systems. Capacity for future scalability in terms of data volume and user load. |
| | Data Storage Management | Provide scalable storage options for high-volume data. Implement auto-archiving for older data. | Cloud-based storage with automated archiving. |
| 13. Program Monitoring & Evaluation | Results-Based Monitoring | Monitor the impact of feed and fodder programs (e.g., improved production, reduced shortages). Generate M&E reports. | Integration with M&E frameworks. Automated KPI tracking. |

4. Key Deliverables

The Consultant shall provide all documentation in both hard and soft copies in English. The key deliverable shall, at minimum, include the following;

| No. | Deliverable | Description |
|-----|---|---|
| 1 | Project Inception Report | Provides the overall project plan, stakeholder engagement strategy, and timeline for execution within 5 days of contract signing. |
| 2 | System Requirements Study (SRS) Document | Detailed review of relevant documents to align the IFFMIS with national needs, including user requirements, workflows, and data flow diagrams. |
| 3 | System Design (SD) Document | Outlines the architecture, including entity-relationship diagrams, technical modules, and integration strategy. |
| 4 | Prototype Demonstrations | Series of web and mobile app demos to validate functionality at different development stages over a six-month period. Demonstrations to be provided in both English and French. |
| 5 | Operational Acceptance Test Plan (OAT) | Plan for conducting UAT to validate system performance and data migration outcomes before final deployment. |
| 6 | Handover of IFFMIS Software with Source Code | Delivery of the final platform with all source code, documentation, and licenses for system ownership. |
| 7 | Training Materials and Delivery | Development of user manuals and multimedia content for technical and non-technical users, following a “Train the Trainer” model. |
| 8 | Final Deployment and Go-Live Report | Documentation of the successful deployment, operational readiness, and transition to live operations, including final data migration. |
| 9 | Post-Deployment Support and Maintenance Plan | Ongoing support plan covering bug fixes, feature upgrades, and capacity building to ensure smooth operation and sustainability. |

5. Requirement of the Consultancy Firm

An IT company or Joint Venture with broad and demonstrative experience in conducting similar assignment is needed. The firms will be evaluated based on following;

- The consultancy firm should be an Agri-tech company or consortium with at least 15 years of IT experience.
- Proven experience in developing similar platforms and enterprise-level solutions on public cloud infrastructure.

- Experience in development of mobile apps with online/offline data collection features on Google Play or App Store.
- Experience working on donor-funded or development partner projects.
- Must demonstrate financial and logistical capability.
- Valid trade license, VAT registrations.

5.1 Resource Requirements and Team Composition

The consulting firm must deploy a minimum of the following core resources for the design, development, and implementation of the IFFMIS platform;

| Role | Required Expertise | Responsibility |
|----------------------------|---|--|
| Project Manager | Skilled in project management and stakeholder coordination. | Manages project timelines, reporting, and stakeholder communication. |
| Software Architect | Expertise in platform architecture and system integration. | Designs and ensures the smooth integration of backend and frontend components. |
| Lead Developer | Proficient in web/mobile app development and APIs. | Builds, tests, and deploys platform modules and dashboards. |
| Training Specialist | Experience in capacity building and MIS user training. | Develops and conducts training for users and administrators. |

5.2 Key Positions Qualification Requirements

| Roles | Responsibilities |
|----------------------------|--|
| Project Manager | <ul style="list-style-type: none"> - Bachelor's or Master's degree in Project Management, IT, or related field. - 10+ years of experience managing IT projects, preferably in agri-tech or MIS projects. - Proven track record in stakeholder engagement, budgeting, and reporting. - Certification in PMP or PRINCE2 is a plus. |
| Software Architect | <ul style="list-style-type: none"> - Degree in Computer Science or related field. - 8+ years of experience in system design and integration. - Expertise in software architecture for web and mobile platforms. - Experience in working with APIs, cloud-based systems, and secure platforms. - Experience in agricultural or feed-related data systems |
| Lead Developer | <ul style="list-style-type: none"> - Bachelor's degree in Software Engineering, IT, or related field. - 7+ years of experience in full-stack development. - Proficiency in front-end and back-end technologies (JavaScript, Python, etc.). - Experience in mobile app development and working with databases. |
| Training Specialist | <ul style="list-style-type: none"> - Degree in Education, IT, or related field. - 5+ years of experience conducting technical training programs. - Experience in MIS-related capacity building and developing training materials. - Strong communication skills in both English and French. |

6. System Handover for IFFMIS

At the end of the warranty period, the Consultant will transfer the IFFMIS operations to the designated national stakeholders. Beforehand, comprehensive training must be provided to key user staff to ensure smooth transition and independent system management. All relevant system documentation—covering the final version of the platform and deliverables, including technical reports and status updates—must be submitted.

A handoff checklist will be agreed with the AU-IBAR Procurement Office to confirm that all required tasks are complete. This includes technical memos, change requests, and operational manuals, ensuring the system is fully documented and ready for independent operation.

7. Institutional Arrangements

The Consultant firm will collaborate closely with the RAFFS Project Team and Country specialists. All deliverables will be submitted to the RAFFS Project for analysis and approval. Any necessary amendments must be completed within 15 working days of receiving feedback.

8. Confidentiality

All data and materials collected during the consultancy remain the property of the contracting party and must not be shared without prior approval.

9. Timeline

The contract will last six (6) months, covering the design, development, implementation, and maintenance of the IFFMIS platform. Full implementation, including all core modules, will be completed within six months of contract signing.

Key milestones will include phased system development, updates, and submission of required deliverables within agreed timelines.

10. Incidental expenditure

There are no incidental expenses envisaged under this contract. Any travel and subsistence costs for missions foreseen in the terms of reference will be covered separately by the contracting authority according to its established procedures. AU-IBAR will take responsibility for all the cost implications related to the organization of the applicable Regional Training Workshops.

11. Fees

The maximum fees payable for all the services envisaged in these terms of reference is US \$50,000. No other payments will be made in respect of this assignment.

12. Evaluation Criteria

| Criteria | Max Points |
|--|------------|
| Organizational Capacity | |
| Proven experience in managing large-scale ICT, data management, or agritech projects with donor-funded activities. | 15 |
| Approach, Methodology & Work Plan | |
| Clarity and feasibility of the proposed methodology, timelines, and alignment with the project's scope. | 15 |
| Key Staff Expertise | |
| Expertise and qualifications of the team in software development, data systems, and agritech solutions. | 15 |
| Specific Experience | |
| Successful completion of similar MIS or agri-data platforms, particularly for public or cloud-based applications. | 40 |
| General Experience | |
| At least 10 years of relevant ICT project implementation and expertise in agritech development. | 15 |

13. Application Procedures

Applicants must submit both a technical proposal and a financial proposal.

13.1 Technical Proposal

The technical proposal should contain;

- Approach and Methodology - Describe the methodology, work plan, objectives, key activities, expected outputs, and a clear timeline.
- Expert Profiles - Include detailed CVs, copies of relevant certificates, and identification documents for proposed experts.
- Statements of Availability and Declarations - Submit signed forms confirming the availability and adherence to exclusion criteria.

13.2 Financial Proposal

The financial proposal must be all-inclusive, covering consultancy fees and any other associated costs. The total budget will be discussed and finalized during contract negotiations.

13.3 Submission of Proposals

Submission Deadline: 4th January 2025 at 17:00 hrs (Nairobi time) via email to:

procurement@au-ibar.org

Submission to any other email address will not be considered.

Clarification Requests: Any requests for clarification should be submitted no later than 18 December 2024 to the same email address. Responses will be forwarded directly to the party seeking clarifications and posted on the AU-IBAR website by 23 December 2024.