

Terms of Reference (TORs)

Hiring of Information Technology Support (ITS) Firm for Modernization and Digitalization of Agriculture Marketing Information Management System (AMIS) of the Agriculture Marketing Wing **Reference No.: PK-SAD-464968-CS-CQS**

1. Background

The Sindh Water and Agriculture Transformation (SWAT) Project, launched in January 2023, is a collaborative initiative between the Government of Pakistan and the World Bank. The project seeks to modernize the agricultural sector of Sindh province by addressing longstanding structural and institutional challenges.

Agriculture is a dominant sector in Sindh's economy, and the majority of fresh produce is traded through wholesale markets (mandis), which are regulated by government-appointed Market Committees. These markets currently operate using manual systems of record-keeping and price tracking, creating several inefficiencies:

- Data on daily prices and traded volumes is often delayed, incomplete, or inconsistently recorded.
- Absence of real-time analytics restricts evidence-based policy making.
- Lack of integration across districts impedes comparative analysis and trend monitoring.

To address these gaps, the Agriculture Delivery Unit (ADU), SWAT intends to establish a robust Agriculture Market Information System (AMIS) to facilitate the collection, storage, automated analysis, and dissemination of daily price and volume data from 27 markets (mandis) across 22 districts of Sindh.

2. Objectives

The primary objective of this assignment is to assist the Agriculture Marketing Wing of Agriculture Supply & Prices Department, GoS in transitioning to a digital system for managing agricultural market information. To this end, the SWAT ADU will engage an Information Technology (IT) firm to design and implement a comprehensive, real-time digital platform. This will include the development of systems for data collection, storage, cleaning, processing, and publication; creation of user-friendly software and mobile applications; specification of necessary equipment and human resource requirements; system testing; and provision of technical assistance for successful deployment. Additionally, the firm will assist in preparing specifications of hardware equipment, preparation of bidding documents, providing procurement assistance, evaluation of bids and support of installation and commissioning.

3. Scope of Work / Tasks

The selected firm will be responsible for undertaking the following tasks:

Task 1. Need Assessment

The IT firm will conduct a need assessment of the Agriculture Market Information System (AMIS) to define its objectives, architecture, features and functionalities as per requirement of the Agriculture Marketing Wing and Market Committees. The IT firm will:

- Assess existing and new data requirements, collection modalities, sharing mechanisms, and dissemination methods/strategies. Identify any data gaps and propose coping strategies on the basis of findings.
- Assess the Learning Need Assessment (LNA) of the officials from the Agriculture Marketing Wing of Sindh department of Agriculture including price and volume data

collectors/fee inspectors from different functional fruit and vegetable markets (Phal & sabzi mandis) which are identified by the Agriculture Market Wing.

- Identify potential risks, such as technical challenges, data quality & security threats in compliance with government rules, and adaptability of AMIS.
- Provide support in the process of determining the need of Human resource and hiring of IT staff for Agriculture Marketing Wing of Sindh department of Agriculture.

Task 2. Android & iOS Applications

- The selected IT firm will be responsible for designing and developing a robust and user-friendly Android & iOS applications to support real-time data collection and reporting from wholesale markets across Sindh.
- To ensure smooth and uninterrupted data entry, the application must support offline functionality with automatic data synchronization once internet connectivity is restored. It should also feature four-tiered user access—Market Data Collector, Market Supervisor, District Officer, and Super Admin—each with customized roles and permissions to maintain data integrity and validation.
- The IT firm will be responsible for integrating the Android & iOS applications with both android & iOS platforms/website to be developed for the AMIS under task 3 below.

Task 3. Android & iOS Website development

a) Website Development and Functionality

- The consulting firm will design and develop a user-friendly, AMIS website to serve as the central digital platform for real-time agricultural market data from 27 wholesale markets across 22 districts of Sindh.
- The key features will include dynamic dashboards with data visualizations (graphs and tables), historical data archives, automated report generation, downloadable reports (Excel/PDF), and a robust Admin Control Panel for managing user accounts, roles, data submissions, and system settings.

b) Integration and Data Synchronization

- The website will be fully integrated with the Android & iOS applications (Task 2 above) to enable real-time display of daily market prices and traded volumes.
- Data collected by field-level price collectors using the mobile app will automatically sync with the website's backend system, ensuring timely, accurate, and consistent data updates across both platforms.

c) Hosting, Ownership, and Compliance

- The firm will be responsible for setting up, managing, and maintaining the website's domain and hosting accounts throughout the contract period.
- All digital assets, including the domain and hosting accounts, will remain the sole property of the Agriculture Marketing Wing.
- The website will be hosted on a secure server with regular backups and will adhere to national data protection and web security standards.

Task 4. Capacity Building

- The IT firm will be responsible for ensuring that relevant staff from the Agriculture Market Wing and the markets are fully trained and proficient in using, managing, and maintaining the new AMIS website and Android & iOS applications.
- The firm will provide technical support and training to facilitate the smooth and sustainable operation of the system.
- To achieve this, the IT firm will:
 - Develop comprehensive training materials, including user manuals in both Urdu and English, tailored to the needs of market staff and the department officials.
 - Conduct hands-on training sessions on the use, administration of the website and Android & iOS applications to be organized at central locations—Hyderabad (39

officials) and Sukkur (22 officials) for staff involved in data collection, supervision, and system management.

- Organize refresher training sessions for the same or newly hired staff, during the implementation period, particularly when system updates are introduced or as needed to reinforce capacity.

Task 5. Procurement Supervision and Support

The IT firm should:

- Define the specific equipment and software requirements including cloud & in-house dedicated servers, workstations, networking equipment, and specialized software for data collection, analysis, and visualization.
- Oversee the installation, deployment of equipment's and software in districts and market committees ensuring that the equipment and software is properly configured and integrated with the existing infrastructure.
- Provide assistance in the procurement process, especially in all technical aspects including drafting tender documents, evaluating of bids and negotiating contracts.
- Establish a secure and reliable server room to house the central database and ensure data security and accessibility as per the requirement of the Directorate General of Agriculture Marketing Sindh and

4. Duration of the Assignment

- The assignment will span 18 months, covering 12 months for system design, piloting, final deployment, capacity building, reporting, and 6 months post-deployment technical support period to ensure system stability, troubleshooting, and performance optimization.

5. Key Technical Staff

The IT firm should have the following key technical staff:

Role	Responsibilities	Qualifications	Experience
Project Manager	Oversees project, manages team, coordinates with stakeholders	Bachelor's/Master's in CS, IT or related field, PMP/PRINCE2 certified	15+ years managing software development
Systems Architect	Designs scalable, robust system architecture	Bachelor's/Master's in Software Engineering, cloud certification	8+ years in system design, mobile and web frameworks
Mobile App Developer	Leads mobile app development (offline capabilities, GPS, barcode)	Bachelor's in CS or related, expertise in Flutter/React Native	5+ years in mobile app development, experience with GPS, offline-first
Senior Web Developer	Manages web-based dashboard development	Bachelor's in CS or related, expertise in Angular/Node.js/Django	5+ years in web application development
Database Administrator	Manages data synchronization, ensures data integrity	Bachelors' in CS or related, Oracle/MySQL/PostgreSQL certified	5+ years as DBA, experience with large data systems

6. Selection Criteria

- The Consultant will be selected in accordance with the Consultant's Qualification-based Selection (CQS) method set out in the Procurement Regulations for IPF Borrowers Goods, Works Non-Consulting and Consulting Services fourth Edition November 2020.
- The selection will be based on the following criteria:
 - At least 5 years of experience in the business of IT consulting, data collection and information systems
 - Successfully completed at least 2 assignments of similar nature and scale, in areas of digital system design, development, and deployment.
 - Competent technical staff.