



**ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY**

**SCHOOL OF ELECTRICAL ENGINEERING AND  
COMPUTING**

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**Software requirement specification document**

**Project Name: AgriLink**

**Author(s): Agrilink Development Team**

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# 1. Introduction

## 1.1 Purpose of this Document

This Software Requirements Specification (SRS) provides a complete, unambiguous description of what Agrilink Ethiopia must do, how it should behave and the standards it must meet. It is the foundational document that will guide development, testing, investor discussions, grant applications and future partnerships.

## 1.2 Document Scope and Objectives

The document captures all functional and non-functional requirements for the Minimum Viable Product (MVP) to be launched across Ethiopia in 2026, with full multilingual support (English, Amharic and Afaan Oromoo) from day one.

## 1.3 Intended Audience

- ✚ Founders and product team
- ✚ Software development team (frontend, backend, mobile)
- ✚ UI/UX designers and field officers
- ✚ Investors, donors and accelerator programs
- ✚ Government stakeholders (Ministry of Agriculture, ATA, Regional Bureaus of Agriculture)
- ✚ Payment and telecom partners (Telebirr, Ethio-Telecom, CBE, etc.)

## 1.4 References and Standards

- Ethiopia Digital Strategy 2025
- National Bank of Ethiopia Mobile Money Guidelines
- Ethiopian Personal Data Protection Proclamation (draft 2024)
- GSMA Mobile for Development – AgriTech Ethiopia Reports 2024-2025
- IEEE Recommended Practice for Software Requirements Specifications (IEEE 830-1998) – adapted for startup speed

## **2. Overall Description**

### **2.1 Product Vision and Mission**

Vision: By 2030, Agrilink will be the most trusted digital marketplace in Ethiopia, directly responsible for increasing smallholder farmer income by at least 30 % while ensuring urban buyers receive fresher, traceable and fairly priced produce.

#### **Mission:**

Remove unnecessary intermediaries, bring transparency to pricing and empower farmers and buyers with data, trust, and direct connection.

### **2.2 Business Context and Problem Statement**

Ethiopian smallholder farmers (over 15 million households) typically receive only 20-40 % of the final retail price due to multiple layers of brokers and transporters. Buyers face inconsistent quality, high rejection rates and lack of origin information. Agrilink solves both problems in one platform.

### **2.3 Product Perspective**

Agrilink is a completely new, independent two-sided marketplace (not an extension of any existing cooperative or government system). It competes directly with traditional brokers and informal WhatsApp/Telegram trading groups while offering superior transparency and traceability.

### **2.4 User Classes and Characteristics**

- Farmers & Primary Cooperatives: rural, low-to-medium digital literacy, use low-end Android phones, primary languages Afaan Oromoo and Amharic
- Wholesalers & Exporters: semi-urban, medium-high literacy, need bulk purchasing tools

- Retailers & Restaurants/Hotels: urban, require consistent supply and quality
- Individual Consumers: urban middle-class, value traceability and freshness
- Agrilink Field Agents & Admin Staff: manage onboarding and disputes

## 2.5 Operating Environment

- ✚ Frontend: React 18 + Tailwind CSS (Progressive Web App) – installable on any Android phone
- ✚ Backend: Node.js (NestJS or Express)
- ✚ Database: MongoDB Atlas (with future option for local Ethiopian hosting)
- ✚ Cloud: AWS Mumbai region (low latency for Ethiopia)
- ✚ Payments: Telebirr (primary), CBE Birr, HelloCash, Amole
- ✚ SMS & OTP: Ethio-Telecom gateway
- ✚ Supported Languages from MVP Launch: English, Amharic (አማርኛ), Afaan Oromoo – 100 % of UI, content, search and notifications

## 2.6 Design and Implementation Constraints

- ✓ Must be fully functional offline for farmers (listing creation and viewing own listings)
- ✓ Installed size must stay under 20 MB (critical for low-end devices)
- ✓ Must support Amharic and Afaan Oromoo keyboards and fonts out-of-the-box
- ✓ Must comply with Ethiopian financial and data protection regulations

## 2.7 Assumptions and Dependencies

- At least 70 % of target farmers have access to an Android smartphone (GSMA 2025 data confirms this)
- Telebirr will provide production API access within three months of agreement
- Internet penetration will continue growing in rural woredas (currently 2G/3G covers 95 % of population)

### **3. Functional Requirements (MVP)**

#### **3.1 User Registration and Onboarding**

The user must register using only an Ethiopian mobile number and OTP. The first screen after app install forces language choice (English | አማርኛ | Afaan Oromoo). Onboarding flow includes short video or illustrated guide in the chosen language.

#### **3.2 Profile Management**

Farmers enter full name, kebele, woreda, zone, primary crops and optional photo. Buyers enter business or personal name, delivery address (with map pin), and business type. Profiles can be edited at any time.

#### **3.3 Product Listing by Farmers**

- Farmers shall create listings containing:
    - Crop and variety (pre-populated multilingual list)
    - Quantity and unit (quintal, kg, sack, etc.)
    - Asking price (fixed or “open to offers”)
    - Up to six photos (auto-compressed and uploaded progressively)
    - Harvest date and earliest delivery date
    - Basic quality grade (self-declared)
    - Optional geo-tag of the farm
- All fields and buttons appear in the user’s selected language.  
Listings can be created fully offline and sync automatically.

### **3.4 Marketplace Browsing and Discovery**

Buyers can browse, search, and filter listings by crop, location (zone/woreda), price range, harvest freshness, and farmer rating. Full-text search works correctly in English, Amharic and Afaan Oromoo scripts. Each listing shows farmer name, photo, rating, distance and traceability information.

### **3.5 Ordering, Negotiation and Payment**

Buyers can either “Buy Now” at the listed price or “Request Quote” with their desired quantity and price. Once agreed, payment is made via Telebirr (primary). Funds are held in escrow until the farmer marks the produce as picked up/delivered. Partial release (e.g., 70 % on pickup, 30 % after quality check) is supported.

### **3.6 Logistics Coordination**

Built-in encrypted chat (text + voice notes) between buyer and farmer. Delivery status updates: Scheduled → Picked Up → In Transit → Delivered → Quality Confirmed. Directory of local transporters will be added in phase 2.

### **3.7 Traceability and QR-Code System**

Every completed listing generates a unique QR code (printable sticker or digital). Scanning the QR code with any phone shows origin details (farmer name, photo, farm location, harvest date) in the scanner’s language.

### **3.8 Ratings, Reviews and Trust Mechanism**

After transaction completion, both parties rate each other 1–5 stars with optional comments. Farmers with more than 20 successful transactions receive a “Verified Farmer” badge.



### 3.9 Admin and Operations Dashboard (Web)

Web-based dashboard for Agrilink staff to monitor transactions, resolve disputes, view real-time GMV, active users, top crops per region and generate reports for investors and government partners.

## 4. Non-Functional Requirements

- ✚ Performance: All screens and listings must load in under 3 seconds on a typical 3G connection
- ✚ Availability: 99.5 % uptime excluding scheduled maintenance
- ✚ Scalability: Must support 100,000 farmers and 50,000 buyers by year three without major re-architecture
- ✚ Security: End-to-end encryption for chat, OTP for every money movement, secure storage of personal data
- ✚ Usability: At least 90 % of farmers must complete a listing without external help (measured in field trials)
- ✚ Offline Capability: Full offline listing creation and viewing of own listings
- ✚ Language & Localization: 100 % UI, content, search, and notifications in English, Amharic, and Afaan Oromoo from day one
- ✚ App Size & Data Efficiency: APK < 20 MB, average listing with photos < 500 KB mobile data
- ✚ Accessibility: Voice-over and high-contrast mode for low-literacy users (phase 2)

## 5. External Interfaces

- Telebirr Payment Gateway (REST + OAuth 2.0)
- Ethio-Telecom SMS/OTP API
- OpenStreetMap + optional Google Maps for location services
- MongoDB Atlas (primary database)
- AWS S3 (or Wasabi) for image and document storage using pre-signed URLs

## **6. Other Requirements**

### **6.1 Data Retention, Privacy and Compliance**

Transaction data retained for seven years for tax purposes. Users can request full deletion of personal data. Platform will comply with future Ethiopian data protection law.

### **6.2 Analytics and Reporting**

Weekly and monthly automated reports covering Gross Merchandise Value, average farmer earnings, buyer savings, regional adoption and top commodities.

### **6.3 Support and Maintenance Requirements**

In-app help center in all three languages, toll-free USSD support line and ability to push urgent updates via PWA.

### **6.4 Future Phases (Out of MVP Scope)**

- Agricultural inputs and services marketplace (seeds, fertilizers, equipment rental)
- Financing and insurance linkage
- AI price prediction and market intelligence
- Native Android and iOS apps

## **7. Glossary**

GMV – Gross Merchandise Value MVP – Minimum Viable Product PWA – Progressive Web  
App OTP – One-Time Password ATA – Agricultural Transformation Agency