

AgriTrace360™ LACRA

Complete Process Flow Documentation

End-to-End Agricultural Traceability System
From Farm Registration to Export Documentation

LIBERIA AGRICULTURE COMMODITY REGULATORY AUTHORITY

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1. SYSTEM OVERVIEW & ARCHITECTURE

AgriTrace360™ is a comprehensive environmental intelligence ecosystem integrating 8 specialized portals for precise monitoring across agricultural sectors. The system leverages real-time satellite monitoring, GPS technology, blockchain traceability, and AI-powered analytics.

Core System Components:

- Multi-tier role-based authentication system
- Real-time EUDR compliance monitoring
- GPS-enhanced farmer registration
- QR-based product traceability
- Integrated payment processing
- Automated stakeholder notifications
- Export documentation workflow

2. USER REGISTRATION & PORTAL ACCESS

FARMER PORTAL

Registration: GPS-enhanced registration with land verification

Access Level: Crop scheduling, harvest management, marketplace access

Restrictions: Cannot map new land plots (restricted to Land Inspectors)

LAND INSPECTOR PORTAL

Registration: Official LACRA inspector credentials required

Access Level: Land mapping, EUDR compliance verification, export authorization

Restrictions: Full access to mapping and compliance systems

WAREHOUSE INSPECTOR PORTAL

Registration: Warehouse facility certification required

Access Level: QR scanning, quality inspection, product registration

Restrictions: 30-day storage limit monitoring

BUYER PORTAL

Registration: Commercial buyer verification and approval

Access Level: Marketplace browsing, lot proposals, payment processing

Restrictions: First-come-first-serve proposal system

EXPORTER PORTAL

Registration: Export license and DDGOTS approval required

Access Level: Marketplace connectivity, export documentation, payment processing

Restrictions: 7-day payment window to buyers

DDGOTS REGULATORY PORTAL

Registration: Government regulatory department access

Access Level: Port inspector assignment, fee calculation, document approval

Restrictions: Full regulatory oversight authority

DDG-AF AUDIT PORTAL

Registration: Audit department government access

Access Level: Payment verification, audit trail monitoring

Restrictions: Financial oversight and compliance tracking

PORT INSPECTOR PORTAL

Registration: Port authority certification required

Access Level: Final quality checks, fumigation validation, export compliance

Restrictions: Final export approval authority

3. DETAILED USER RESPONSIBILITIES BY PORTAL

FARMER PORTAL RESPONSIBILITIES

Registration Requirements:

- Valid government-issued ID
- Land ownership or lease documentation
- GPS coordinates of farming location
- Contact information and banking details

Daily Responsibilities:

- Create and maintain crop planting schedules
- Update crop growth progress regularly
- Monitor weather and environmental conditions
- Record farming activities and inputs used
- Mark harvest completion when crops are ready
- Respond to buyer inquiries and proposals
- Maintain accurate farming records

System Interactions:

- Access crop scheduling dashboard
- View harvest schedules and marketplace
- Receive notifications from inspectors and buyers
- Cannot create new land mappings (restricted)
- Must await automatic batch code generation

LAND INSPECTOR PORTAL RESPONSIBILITIES

Certification Requirements:

- Official LACRA inspector certification
- GPS and satellite monitoring training
- EUDR compliance expertise
- Environmental assessment qualifications

Core Responsibilities:

- Verify and map all farmer land boundaries
- Conduct EUDR compliance assessments
- Monitor satellite imagery for deforestation
- Validate GPS coordinates and land use
- Authorize export product transfers
- Generate compliance certificates
- Submit regulatory data to DDGOTS

Authority Level:

- Full land mapping system access
- Export transfer authorization power
- EUDR compliance certification authority
- Direct DDGOTS regulatory submission

WAREHOUSE INSPECTOR PORTAL RESPONSIBILITIES

Certification Requirements:

- Warehouse facility inspection certification
- Food safety and quality assessment training
- QR code scanning system proficiency
- Product grading and classification expertise

Daily Operations:

- Scan and verify QR codes on incoming products
- Conduct comprehensive quality inspections
- Verify quantity and weight measurements
- Register products under batch codes
- Monitor 30-day storage limit compliance
- Generate buyer notifications for available lots
- Maintain warehouse inventory records

Quality Control Standards:

- Grade products according to export standards
- Assess moisture content and foreign matter
- Verify traceability documentation completeness
- Ensure proper storage conditions
- Document any quality issues or discrepancies

BUYER PORTAL RESPONSIBILITIES

Registration Requirements:

- Valid commercial business registration
- Financial capability verification
- Trade license and permits
- Banking and payment processing setup

Trading Responsibilities:

- Browse available product lots in warehouse
- Submit competitive purchase proposals
- Negotiate terms with farmers and warehouses
- Process payments within agreed timeframes
- Create marketplace listings for exporters
- Maintain product quality during ownership
- Coordinate delivery and logistics

Market Regulations:

- Follow first-come-first-serve proposal system
- Respect 30-day warehouse storage limits
- Maintain transparent pricing practices
- Comply with payment confirmation requirements

EXPORTER PORTAL RESPONSIBILITIES

License Requirements:

- Valid export license from DDGOTS
- International trade certification
- Foreign exchange dealing authorization
- Shipping and logistics partnerships

Export Operations:

- Review marketplace listings from buyers
- Negotiate export terms and conditions
- Accept or reject purchase proposals
- Process payments to buyers within 7-day window
- Coordinate product transfer to export warehouses
- Pay processing fees to regulatory authorities
- Download and manage export documentation

Compliance Obligations:

- Maintain EUDR compliance throughout export process
- Ensure product traceability documentation
- Coordinate with port inspection schedules
- Pay all regulatory fees within deadlines
- Maintain 30-day document download access

DDGOTS REGULATORY PORTAL RESPONSIBILITIES

Government Authority:

- Official government regulatory department access
- Export permit issuance authority
- Port inspection oversight responsibility
- Fee calculation and collection authority

Regulatory Duties:

- Assign certified Port Inspectors for final inspections
- Review and verify inspection reports
- Calculate applicable processing and export fees
- Issue fee intimations to exporters
- Approve final document release after payment
- Maintain regulatory compliance database
- Coordinate with international trade authorities

Oversight Responsibilities:

- Monitor entire export pipeline compliance
- Ensure EUDR regulation adherence
- Validate quality and safety standards
- Coordinate with DDG-AF for financial oversight

DDG-AF AUDIT PORTAL RESPONSIBILITIES

Audit Authority:

- Government audit department access
- Financial transaction oversight authority
- Payment verification responsibility
- Audit trail maintenance duty

Financial Oversight:

- Monitor all exporter-to-buyer payments
- Verify processing fee payments from exporters
- Validate payment receipts and documentation
- Maintain comprehensive audit trail records
- Confirm payment authenticity before document release
- Coordinate with DDGOTS for approval processes
- Generate financial compliance reports

Audit Procedures:

- Review all payment confirmations within 24 hours
- Cross-verify payment amounts with system records
- Investigate any payment discrepancies
- Provide payment confirmation to DDGOTS for approval

PORT INSPECTOR PORTAL RESPONSIBILITIES

Certification Requirements:

- Port Authority inspection certification
- International export standards training
- Fumigation and pest control expertise
- Quality assessment and grading proficiency

Inspection Duties:

- Conduct final quality checks at port facilities
- Validate fumigation certificates and treatments
- Verify export standard compliance
- Assess product condition for international shipping
- Generate comprehensive inspection reports
- Submit findings to DDGOTS for verification
- Approve or reject products for export

Final Authority:

- Final quality approval for export shipments
- Authority to reject non-compliant products
- Responsibility for international quality standards
- Direct communication with shipping authorities

4. LAND MAPPING & EUDR COMPLIANCE

Land Inspector Responsibilities:

- GPS coordinate verification and mapping
- Satellite deforestation monitoring
- EUDR compliance documentation
- Land use authorization and verification
- Environmental impact assessment

EUDR Compliance Process:

1. Satellite imagery analysis for deforestation
2. GPS boundary verification
3. Environmental compliance certification
4. Traceability data integration
5. DDGOTS regulatory submission

5. CROP SCHEDULING & HARVEST MANAGEMENT

Farmer Portal Workflow:

- Crop planting schedule creation
- Growth monitoring and updates
- Harvest completion marking
- Automatic batch code generation
- Stakeholder notification system

Automatic Batch Code Generation:

When farmers mark crops as harvested:

- !' System automatically generates batch codes
- !' Notifies Land Inspector, Warehouse Inspector
- !' Alerts three-tier regulatory panels
- !' No manual farmer intervention required

6. WAREHOUSE OPERATIONS & QR SYSTEM

Warehouse Inspector Process:

- QR code scanning and verification
- Quality inspection and grading
- Quantity verification and recording
- Product registration under batch codes
- 30-day storage limit monitoring
- Buyer notification system

Buyer Notification System:

- Automatic alerts when products arrive
- Quality and quantity details provided
- First-come-first-serve lot proposal system
- Real-time availability updates

7. BUYER MARKETPLACE & TRANSACTIONS

Buyer Portal Functionality:

- Browse available product lots
- Submit purchase proposals
- Negotiate terms and conditions
- Process payments and confirmations
- Create marketplace listings for exporters

Marketplace Listing Creation:

- Product details and specifications
- Pricing and payment terms
- Export readiness status
- Exporter connectivity features

8. EXPORTER INTEGRATION & NEGOTIATIONS

Exporter-Buyer Communication:

- Call, SMS, or internal messaging system
- Product discussion and review
- Price and terms negotiation
- Proposal acceptance or rejection

Transaction Code Generation:

Upon exporter proposal acceptance:

- !' Unique transaction code generated
- !' Details sent to Buyer Warehouse
- !' Regulatory DDGOTS notification
- !' Land Inspector authorization required

Land Inspector Authorization:

- Product transfer authorization
- EUDR compliance verification
- Export permit validation
- Delivery code generation approval

9. EXPORT PAYMENT & PORT INSPECTION

7-Day Payment Window:

- Exporter must pay buyer within 7 days
- Both parties confirm payment
- DDG-AF records for audit purposes
- DDGOTS notified for port inspection

Port Inspector Assignment:

- DDGOTS assigns certified Port Inspector
- Inspection scheduling at port facilities
- Permit request tracking system
- Export compliance requirements

Final Quality Checks:

- Comprehensive product quality assessment
- Fumigation validation and certification
- Export standard compliance verification
- Inspection report generation

10. DOCUMENT RELEASE & CERTIFICATION

DDGOTS Verification & Fee Calculation:

- Inspection report validation
- Export compliance verification
- Processing fee calculation
- Fee intimation to exporter

DDG-AF Payment Verification:

- Processing fee payment confirmation
- Receipt verification and validation
- Audit trail documentation
- Document release authorization

Complete Export Document Package (7 Documents):

1. Export Permit - Official government authorization
2. Quality Certificate - Product quality verification
3. Fumigation Certificate - Pest treatment validation
4. EUDR Compliance Certificate - EU regulation compliance
5. Product Origin Certificate - Official origin verification
6. Traceability Documents - Complete farm-to-export tracking
7. Inspection Report - Detailed port inspection findings

Dashboard Access: 30-day download window with full document access

11. PORTAL RESPONSIBILITIES MATRIX

Farmer Portal:

Primary: Crop management
Secondary: Harvest completion
Key Role: No land mapping

Land Inspector:

Primary: Land mapping
Secondary: EUDR compliance
Key Role: Export authorization

Warehouse Inspector:

Primary: QR scanning
Secondary: Quality inspection
Key Role: 30-day storage

Buyer Portal:

Primary: Lot proposals
Secondary: Payment processing
Key Role: First-come basis

Exporter Portal:

Primary: Export negotiations
Secondary: Document access
Key Role: 7-day payment

DDGOTS Regulatory:

Primary: Port inspection
Secondary: Fee calculation
Key Role: Full oversight

DDG-AF Audit:

Primary: Payment verification
Secondary: Audit tracking
Key Role: Financial oversight

Port Inspector:

Primary: Final inspection
Secondary: Export compliance
Key Role: Final approval

12. COMPLETE 18-POINT INTEGRATION FLOW

1. Land Inspector EUDR compliance data !' DDGOTS
2. Warehouse QR batch approval system
3. Automatic harvest !' buyer notifications
4. First-come-first-serve lot proposal system
5. Payment confirmation !' DDG-AF audit routing
6. Warehouse delivery registration with quality inspection
7. Warehouse product registration (30-day storage limits)
8. Buyer marketplace listing !' exporter connectivity
9. Exporter proposal response (accept/reject functionality)

10. Land Inspector authorization !' export transfers
11. Buyer warehouse delivery code generation
12. Exporter warehouse product receipt with QR verification
13. Exporter payment to buyer (7-day window) !' DDG-AF/DDGOTS
14. Port Inspector assignment !' quality checks/export compliance
15. Port inspection !' fumigation validation/export standards
16. DDGOTS inspection verification !' processing fee calculation
17. Exporter processing fee payment !' DDG-AF receipt verification
18. DDG-AF payment confirmation !' DDGOTS document release approval

System Benefits:

- Complete farm-to-export traceability
- Automated stakeholder notifications
- Real-time compliance monitoring
- Integrated payment processing
- Comprehensive audit trail
- Multi-tier regulatory oversight
- Export documentation automation

System Technical Specifications:

- Frontend: React (TypeScript) with Wouter routing
- Backend: Node.js (Express.js) with TypeScript
 - Database: PostgreSQL with Drizzle ORM
 - Authentication: Multi-tier role-based system
- Integration: Real-time satellite monitoring & GPS technology

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