

# **Harvest Circle - Digital Agricultural Marketplace System**

## **1. Project Overview**

Harvest Circle is a web and mobile-based digital agricultural marketplace system designed to connect farmers directly with buyers, provide real-time market information, enable secure digital payments, and reduce post-harvest losses in Kenya.

## **2. Background and Justification**

Small-scale farmers in Kenya often rely on middlemen due to lack of market access and price information. This results in low profits, delayed payments, and food wastage. Harvest Circle leverages information technology to create a transparent, efficient, and inclusive agricultural market.

## **3. Problem Statement**

Small-scale farmers in Kenya face significant challenges in accessing reliable markets, obtaining fair prices for their produce, and receiving timely payments. The agricultural market is dominated by middlemen who exploit farmers due to lack of price transparency and limited access to buyers. Additionally, farmers lack real-time market information, efficient logistics support, and secure digital payment mechanisms, leading to low incomes and high post-harvest losses. There is therefore a need for a digital platform that directly connects farmers to buyers, ensures transparent pricing, and facilitates secure transactions.

Farmers lack direct access to buyers, real-time pricing data, and reliable payment mechanisms, leading to exploitation and reduced income.

## **4. Project Objectives**

### **General Objective**

To develop a digital marketplace that links farmers directly to buyers and improves agricultural trade efficiency.

### **Specific Objectives**

- To enable farmers to list and sell produce online
- To provide real-time market price information
- To support secure digital payments
- To facilitate logistics and delivery tracking

## **5. Scope of the System**

### **In Scope**

- Farmer and buyer registration

- Product listing and search
- Price display and negotiation
- Mobile money payments (e.g., M-Pesa)
- Order management

## **Out of Scope**

- Physical storage of produce
- International export compliance

## **6. Stakeholders**

- Farmers
- Buyers (wholesalers, retailers, processors)
- Transport providers
- System administrators
- Government agencies (support role)

## **7. Functional Requirements**

- User registration and authentication (farmers, buyers, customers, admins)
- Farmer produce listing with quantity, price, and location
- Location-based search to allow customers to find nearby farmers
- Product search, filter, and sorting (by distance, price, freshness)
- Support for small-quantity orders (retail-level purchases)
- Order placement, tracking, and notifications
- Payment processing (mobile money and other digital payments)
- Rating and review system for farmers and buyers

## **8. Non-Functional Requirements**

- Security: secure authentication, encrypted transactions, and data protection
- Performance: fast location-based search and order processing
- Scalability: ability to support many users and transactions
- Availability: system accessible 24/7
- Usability: simple, mobile-friendly interface suitable for low digital literacy
- Reliability: accurate location data and order fulfillment

## **9. High-Level System Architecture**

- Frontend: Web and Mobile App
- Backend: Application server and APIs
- Database: Centralized relational database
- Integration: Mobile money APIs, SMS notifications

## **10. Expected Benefits**

### **Benefits to Farmers**

- Direct access to customers without middlemen
- Fair and transparent pricing of agricultural produce

- Increased income through bulk and small-quantity sales
- Reduced post-harvest losses due to faster access to nearby markets
- Wider market reach including households, retailers, and restaurants
- Secure and timely digital payments
- Ability to build trust through ratings and reviews

### **Benefits to Buyers / Customers**

- Easy access to fresh and perishable produce from nearby farmers
- Convenience of ordering through a mobile or web platform
- Flexibility to purchase small or bulk quantities
- Lower prices due to elimination of middlemen
- Faster delivery due to reduced distance
- Transparency through farmer profiles and reviews
- Secure payments and order tracking

## **11. Risks and Mitigation**

- Low digital literacy → User training and simple UI
- Poor internet connectivity → SMS-based features
- Trust issues → Ratings and verification system

## **12. Conclusion**

Harvest Circle provides a sustainable IT-based solution to improve agricultural trade and farmer livelihoods in Kenya. Harvest Circle creates a win-win situation where farmers benefit from increased income, fair pricing, and reduced losses, while buyers enjoy convenient access to fresh produce, flexible purchase options, and transparent pricing.