

Agrilink

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Abstract — Agricultural waste management and access to modern farming equipment are major challenges for farmers, especially in rural areas. Improper disposal of agricultural waste leads to environmental pollution, while the high cost of farming machinery limits productivity for small and marginal farmers. To address these issues, this project proposes an integrated digital solution consisting of an Android application for farmers and a web application for service providers. The system enables farmers to manage and recycle agricultural waste by connecting them with recyclers and also allows them to rent farming equipment at affordable rates. The web application supports equipment owners and recycling agencies in managing services and transactions. This solution promotes sustainable farming, resource sharing, and a circular agricultural economy while reducing costs and improving productivity.

Keywords: Agricultural Waste, Equipment Rental, Android Application, Web Application, Sustainable Farming, Smart Agriculture

I. INTRODUCTION

Agriculture is a major source of livelihood in rural India, but farmers face challenges such as improper agricultural waste management and limited access to modern farming equipment. Large amounts of crop residue are often burned or wasted, causing environmental pollution and loss of potential income. At the same time, the high cost of farming machinery makes it unaffordable for small and marginal farmers, reducing productivity and efficiency.

To overcome these issues, this project proposes an integrated digital solution using an Android application for farmers and a web application for service providers. The system enables farmers to manage and recycle agricultural waste by connecting them with recyclers and also allows them to rent agricultural equipment at affordable rates. This approach promotes sustainable farming, reduces cultivation costs, and improves agricultural productivity. The proposed system supports a circular agricultural economy and contributes to rural development through technology-driven solutions.

II. LITERATURE SURVEY

A. Agricultural Equipment Rental Systems

Traditional farming requires farmers to purchase expensive machinery or use informal rental sources. These methods have limitations:

- High Cost: Modern equipment is too expensive for small farmers.
- Limited Access: Local rentals are seasonal and unreliable.
- Low Transparency: Pricing, availability, and equipment condition are unclear.

B. Agricultural Waste Management Systems

Traditional waste practices, like dumping or burning crop residues, have several issues:

- Pollution: Open burning causes air pollution.
- Resource Loss: Waste is not converted into compost or fertilizers.
- Low Awareness: Farmers lack knowledge of recycling methods.
- No System: Waste collection and processing are unorganized.

C. Existing Digital Agriculture Systems

Some digital solutions exist but mainly focus on one issue. Their limitations include:

- Single-Purpose: Platforms handle either waste or equipment rental.
- Limited Access: Not designed for rural users or local languages.
- Poor Integration: Coordination between farmers and providers is low.
- Adoption Issues: Complex interfaces make usage difficult for less tech-savvy farmers.

III. SYSTEM ARCHITECTURE

The architecture of the proposed system integrates a mobile-based farmer application, a web-based service provider platform, and a centralized database system to efficiently manage agricultural waste and equipment rental services.

A. Front-End Components

- Farmer Android App: Used for listing agricultural waste and renting farming equipment.
- User Interface: Simple and user-friendly with regional language support.
- Notifications: Provides real-time updates on requests and bookings.

B. Back-End Infrastructure

- Application Server: Handles user requests and system operations.
- Database (MySQL): Stores user details, equipment data, waste information, and transactions.
- Web Application: Allows service providers to manage equipment and waste services.

C. Communication System

- Connects farmers and service providers through the server.
- Transfers data related to rentals, waste management, and service updates.
- Sends real-time alerts and status notifications.

D. Working Flow

- Farmer logs in to the Android application.
- Farmer submits waste details or equipment rental request.
- Service provider receives and processes the request.
- System updates status and notifies the farmer.
- Data is stored securely in the database.

IV. DATA SET

A. Dataset Preparation

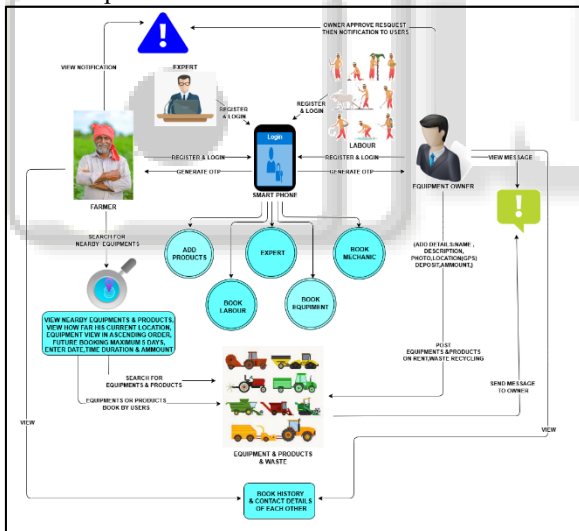
The dataset for the system consists of user-generated data collected through the Android and web applications. This includes farmer profiles, equipment details, waste categories, and service request records.

B. Data Processing

Collected data is processed on the server to validate inputs, update availability status, and manage bookings. Duplicate entries and incorrect data are filtered to ensure accuracy and reliability.

C. Dataset Composition

- Farmer registration details.
- Equipment listings and rental prices.
- Agricultural waste types and quantities Booking and transaction records.
- Service provider information.



V. CONCLUSION

The proposed Agricultural Waste Management and Equipment Rental System provides a simple and effective solution for farmers. It allows efficient management of agricultural waste and access to modern farming equipment through an Android application and a web platform.

Key outcomes:

- Waste Management: Farmers can sell or recycle agricultural waste, reducing pollution and generating extra income.
- Equipment Rental: Farmers can rent machinery at affordable rates, lowering costs and increasing productivity.

- User Convenience: Real-time updates and a simple interface make the system easy to use for rural farmers.
- Future improvements may include AI-based crop suggestions, GPS-enabled service mapping, and integration with government schemes, making the system more scalable and sustainable.

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REFERENCES

- [1] Chetan Ner et al., "Agricultural Equipment's Rental System," *Int. Res. J. of Modernization in Engg. Tech. and Science*, March 2023.
- [2] M. Nagendra Raju et al., "Web-Based Form Equipment Rental System for Agriculture," *Int. J. of Creative Research Thoughts*, June 2022.
- [3] Chella Ashok Kumar, M. Saravanamuthu, "AGRARYANS: Farm Equipment Rental System," *Int. Res. J. of Engg. and Tech.*, June 2022.
- [4] Bhuvan S. et al., "Agri-Equipment Rental System," *Int. J. of Scientific Development and Research*, May 2019.
- [5] Muhammad Ayaz et al., "IoT-Based Smart Agriculture," 2019.
- [6] Krunal Bagaitkar, Khoshant Lande, "Tractor Hiring Application for Farmers," 2018.