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ENGINEERING COLLEGE**
An AUTONOMOUS Institution
Affiliated to ANNA UNIVERSITY, Chennai

**CS19611 - MOBILE APPLICATION DEVELOPMENT PROJECT
REPORT**

**FARMTRACT – A SECURE & TRANSPARENT DIGITAL CONTRACT
FARMING PLATFORM**

Submitted by

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in partial fulfilment for the course for the degree of

BACHELOR OF ENGINEERING

In

COMPUTER SCIENCE AND ENGINEERING

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5 MAY 2025

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BONAFIDE CERTIFICATE

This project report titled "**FARMTRACT – A SECURE & TRANSPARENT DIGITAL CONTRACT FARMING PLATFORM**" is the bonafide work of **KIRUTHIGA M (220701132)**, who carried out the work under my supervision. Certified further that to the best of my knowledge, the work reported herein does not form part of any other thesis or dissertation based on which a degree or award was conferred earlier.

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ACKNOWLEDGEMENT

Initially we thank the Almighty for being with us through every walk of our life and showering his blessings through the endeavor to put forth this report. Our sincere thanks to our Chairman **Mr. S. Meganathan, B.E, F.I.E.**, our Vice Chairman **Mr. Abhay Shankar Meganathan,B.E.,M.S.**, and our respected Chairperson **Dr. (Mrs.) Thangam Meganathan, Ph.D.**, for providing us with the requisite infrastructure and sincere endeavouring in educating us in their premier institution.

Our sincere thanks to **Dr. S. N. Murugesan, M.E., Ph.D.**, our beloved Principal for his kind support and facilities provided to complete our work in time. We express our sincere thanks to **DR.P. KUMAR**, Head of the Department of Computer Science and Design for his guidance and encouragement throughout the project work. We convey our sincere thanks to our internal guide and Project Coordinator, **Dr. KARTHICK**, ASSOCIATE PROFESSOR Rajalakshmi Engineering College for his valuable guidance throughout the course of the project.

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TABLE OF CONTENT

CHAPTER No.	TITLE	PAGE No.
1)	Abstract	5
2)	Introduction	6
3)	Literature Survey	7
4)	Proposed System	8
5)	Module Description	10
6)	Implementation and Results	12
7)	Conclusion and Future Enhancements	14
8)	References	14

CHAPTER 1

ABSTRACT

Farmtract is a user-friendly mobile application designed to simplify and secure the process of contract farming for both farmers and buyers. It is developed using Flutter and Firebase, ensuring cross-platform compatibility and real-time data handling. The main goal of this app is to provide a transparent and trustworthy environment where farmers can list their produce and buyers can make assured purchases under legally enforceable digital contracts.

Users can register, log in, list products, negotiate prices, and generate mutual contracts through a streamlined process. The app supports features like live price tracking, escrow-based payments, and contract status monitoring. All interactions are securely handled, and data is stored in the cloud, allowing access across devices with or without continuous connectivity.

The interface is clean and intuitive, making it accessible to both tech-savvy and rural users. Farmtract is built using modern technology and follows best development practices for speed, security, and scalability.

This project was created to address a major issue in agriculture — the lack of stable market access and transparent transactions for farmers. With Farmtract, users can build trust, reduce risks, and contribute to a more efficient and fair agricultural supply chain. Future updates may include blockchain integration, multilingual support, and AI-based price forecasting for further reliability.

CHAPTER 2

INTRODUCTION

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2.1 GENERAL

Farmtract is a user-friendly and efficient mobile application designed to facilitate secure contract farming between farmers and buyers. Developed using Flutter and Firebase, the app provides a smooth interface for listing farm produce, price negotiation, and generating legally binding digital contracts. It supports features like real-time price tracking, escrow-based payments, and contract enforcement to ensure transparency and fairness in agricultural transactions. With both parties verified through a streamlined registration system, Farmtract ensures secure and trustworthy interactions. Data is synced with cloud storage, providing reliable access while maintaining operational efficiency even with limited connectivity.

2.2 OBJECTIVE

- To develop a mobile application that enables secure and transparent contract farming.
- To improve market access for farmers and ensure fair trade through verified listings and price negotiation features.
- To promote legal contract enforcement, escrow-based payments, and live price tracking for agricultural goods.
- To empower rural users with a simple, multilingual-friendly interface that works even in low-connectivity zones.

2.3 EXISTING SYSTEM

Current agricultural platforms either lack standard contract systems or involve complex procedures, making them difficult to use for small-scale farmers. Many platforms focus on product listings or logistics but fail to support digital

contracts or secure payments. Moreover, trust issues, middlemen exploitation, and lack of real-time price visibility reduce their effectiveness. Some existing

solutions also demand continuous internet access or charge high commissions, limiting their reach in rural areas.

CHAPTER 3

LITERATURE SURVEY

A number of platforms and government initiatives aim to address the challenges in agriculture supply chains, especially in terms of price assurance and market access. Applications like eNAM (National Agriculture Market), AgriBazaar, and Kisan Suvidha offer functionalities ranging from market pricing information to farm input listings and weather updates. These platforms focus on digital integration of the agri-market but often fall short in terms of contract enforcement and direct buyer-farmer engagement.

However, several **limitations** are frequently observed in these systems:

- Lack of **digitally enforceable contracts** between farmers and buyers.
- **Limited payment security mechanisms** like escrow services.
- High **complexity** and steep learning curves, making them less accessible to small-scale or less tech-savvy farmers.
- **Dependence on continuous internet** access, which is not feasible in many rural regions.

Research in agri-digital platforms and user feedback reveals a growing demand for **simple, contract-based, and secure** tools that can empower farmers without exposing them to exploitation. Case studies also highlight the need for a **neutral, trusted medium** for negotiation and payment in farming agreements.

These insights support the development of **Farmtract**, which offers a clean, mobile-first solution focused on **price transparency, secure contracts, and inclusive market access**, particularly designed for rural India's farming communities.

CHAPTER 4

PROPOSED SYSTEM

4.1 SYSTEM OVERVIEW

Farmtract is a secure, user-friendly mobile application designed to enable transparent and enforceable contract farming between farmers and buyers. Unlike traditional platforms that focus only on listings or require complex onboarding, Farmtract provides a minimal yet complete ecosystem for creating digital contracts, negotiating prices, and settling payments using escrow services. Users can register as either farmers or buyers, list agricultural products or express purchase interest, and proceed through a guided contract generation and settlement process. The system leverages Flutter for a cross-platform frontend and Firebase for real-time backend services. With cloud-based storage and optimized mobile interfaces, the app ensures seamless usability even in low-connectivity rural areas.

4.2 SYSTEM ARCHITECTURE

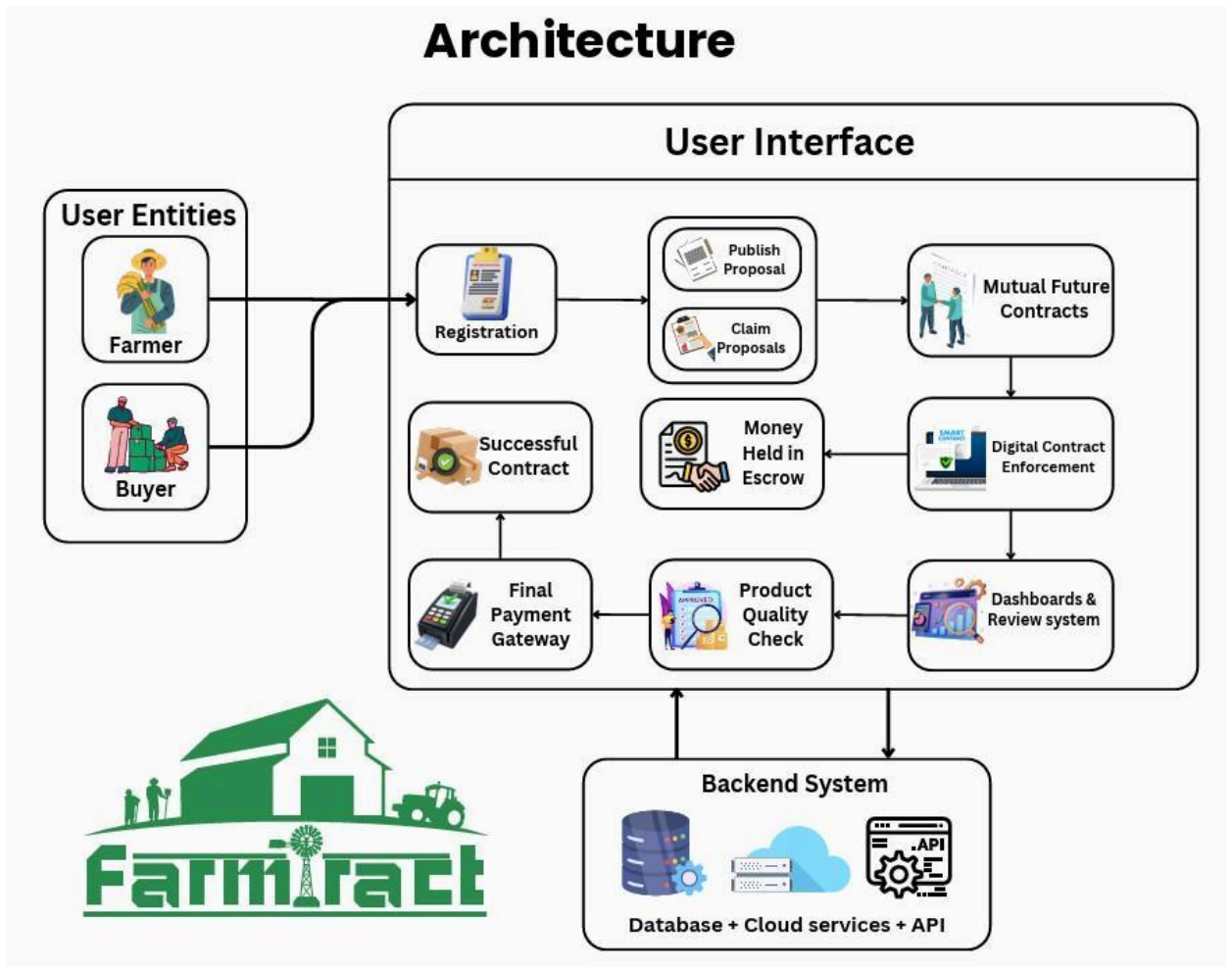
The core flow of the system can be described as follows:

- User launches the app and selects a role: Farmer or Buyer.
- New users go through a simple **registration and verification** process.
- Farmers can **list products**, including crop type, quantity, and expected price.
- Buyers can **browse listings**, use filters, and initiate **bid/ask negotiation**.
- Once a deal is accepted, a **digital contract** is automatically generated.
- Both parties **digitally sign** the contract through the app interface.
- The buyer's payment is held in **escrow** until product delivery.
- A **product quality check** can be logged upon delivery.
- Once verified, the **escrow is released** and final payment is completed.
- Users can monitor active and past contracts through a **dashboard** view.

Each transaction includes:

1. Product Details (Crop Name, Quantity, Price)
2. Party Details (Farmer and Buyer IDs)
3. Contract Terms (Date, Expiry, Delivery Location)
4. Status (Pending, Signed, In Progress, Completed)

The system ensures data is updated in real-time and accessible anytime via cloud integration, while maintaining user privacy and contract enforceability.



(Fig 3.1 System Architecture)

CHAPTER 5

MODULE

DESCRIPTION

5.1 MODULES

- **User Registration & Verification Module:**

Allows new users to sign up as either a farmer or buyer with basic details.

Implements user identity verification to ensure only genuine users can access the platform. Supports secure login and role-based access to features.

- **Product Listing & Search Module:**

Enables farmers to create listings for their produce, including details like crop type, quantity, expected price, and availability. Buyers can browse these listings using filters for category, price, and location.

- **Price Negotiation & Contract Module:**

Provides a platform for real-time bidding and negotiation between buyers and farmers. Once both parties agree, the app automatically generates a digital contract with terms including quantity, price, delivery, and expiration.

- **Escrow & Payment Handling Module:**

Manages the financial transactions between buyers and farmers. Payment is held in escrow until the contract terms are fulfilled and the product is received. Final payment is released post verification to ensure trust and security.

- **Contract Dashboard Module:**

Displays a comprehensive overview of current and past contracts for both buyers and farmers. Includes contract status (pending, signed, completed), payment updates, and contract history.

- **Cloud Storage & Sync Module:**

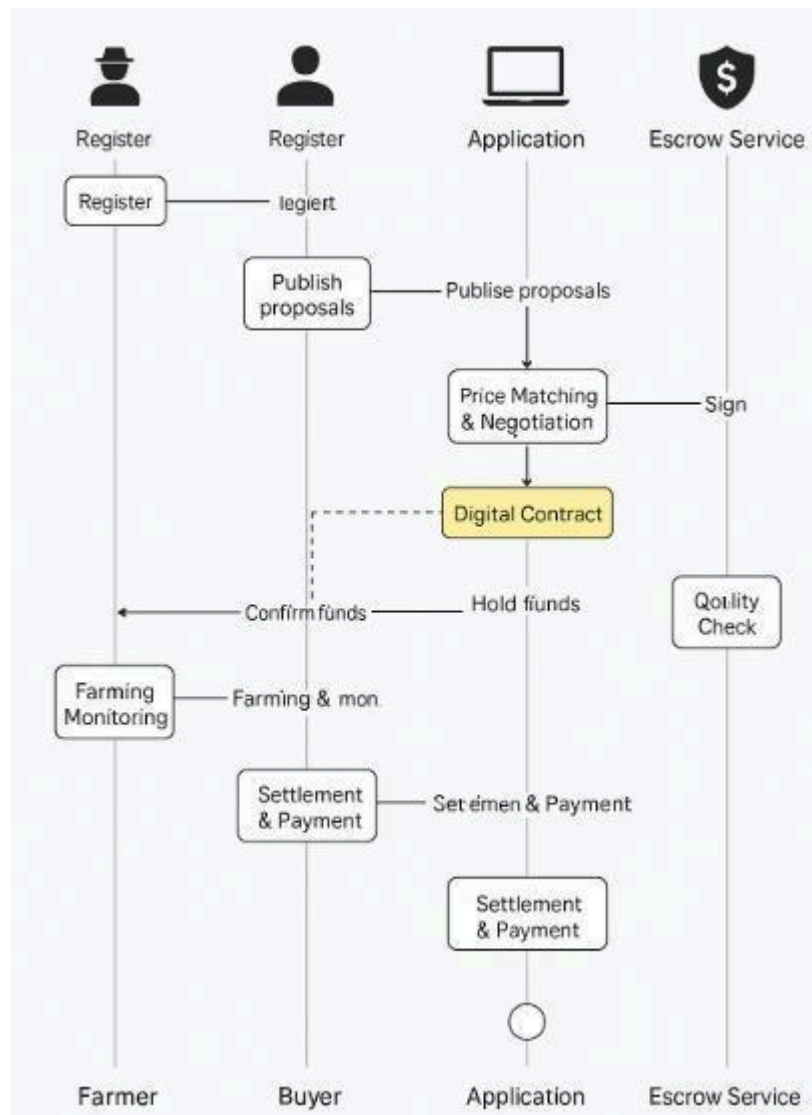
Handles all backend operations using Firebase to securely store user data,

contracts, and transaction history. Ensures real-time updates and access across devices without data loss.

- **UI/UX Module:**

Presents a clean, modern, and responsive interface suitable for rural and urban users alike. Ensures smooth navigation, multilingual adaptability (planned), and intuitive workflows for contract creation and tracking.

5.2 SEQUENCE DIAGRAM



(Fig 4.1 Sequence Diagram)

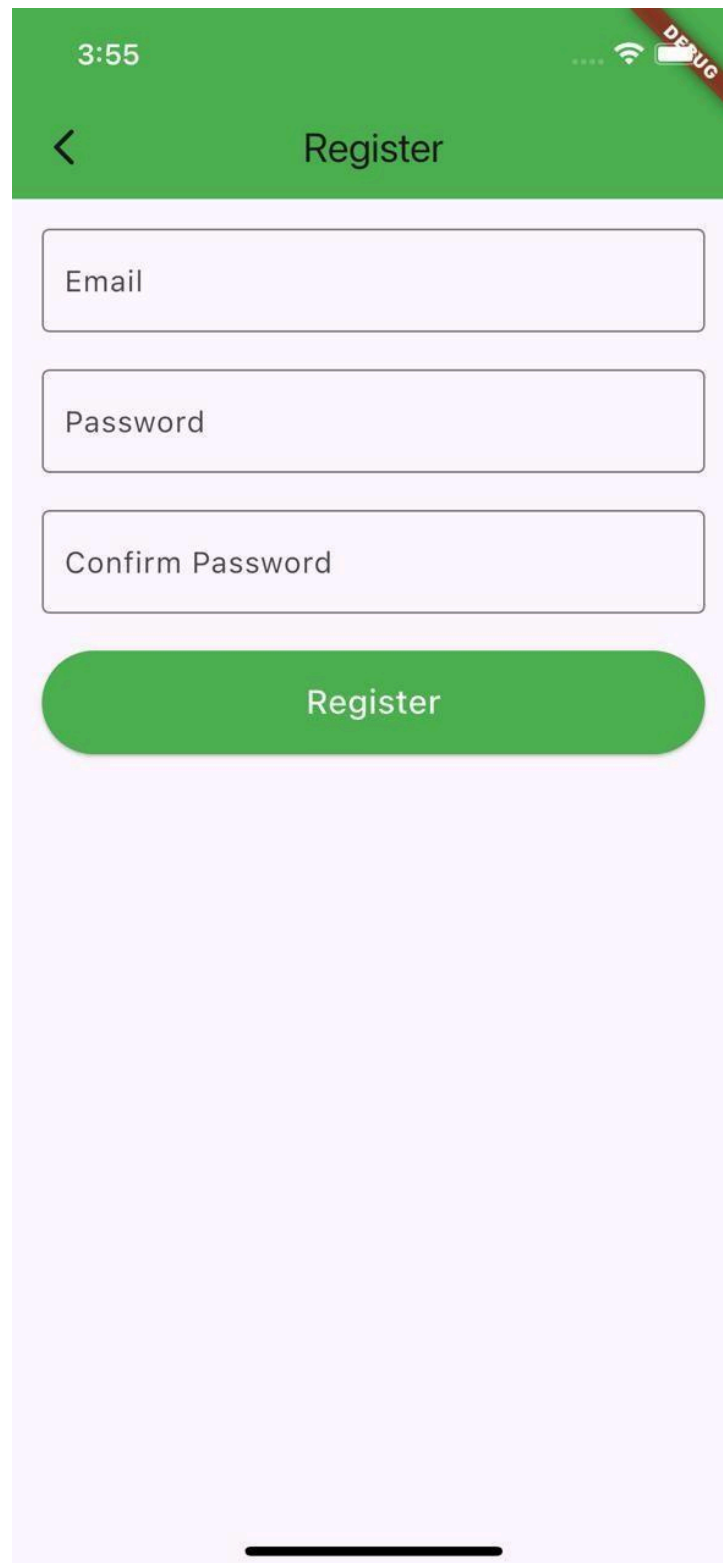
CHAPTER 6

IMPLEMENTATION AND RESULTS

6.1 TOOLS USED

- Flutter
- Dart
- Firebase
- Firestore
- GraphQL
- FlutterFlow
- Android Studio

6.2 OUTPUT SCREENSHOTS



A screenshot of a mobile application's user registration screen. The screen has a green header bar with a back arrow on the left and the title "Register" in the center. Below the header, there are three white input fields with green borders, labeled "Email", "Password", and "Confirm Password". At the bottom of the form is a large green button with rounded corners labeled "Register". The status bar at the top shows the time 3:55, signal strength, Wi-Fi, and battery icons. A red "DEBUG" banner is visible in the top right corner.

3:55

< Register

Email

Password

Confirm Password

Register

Fig 6.2.1 User registration

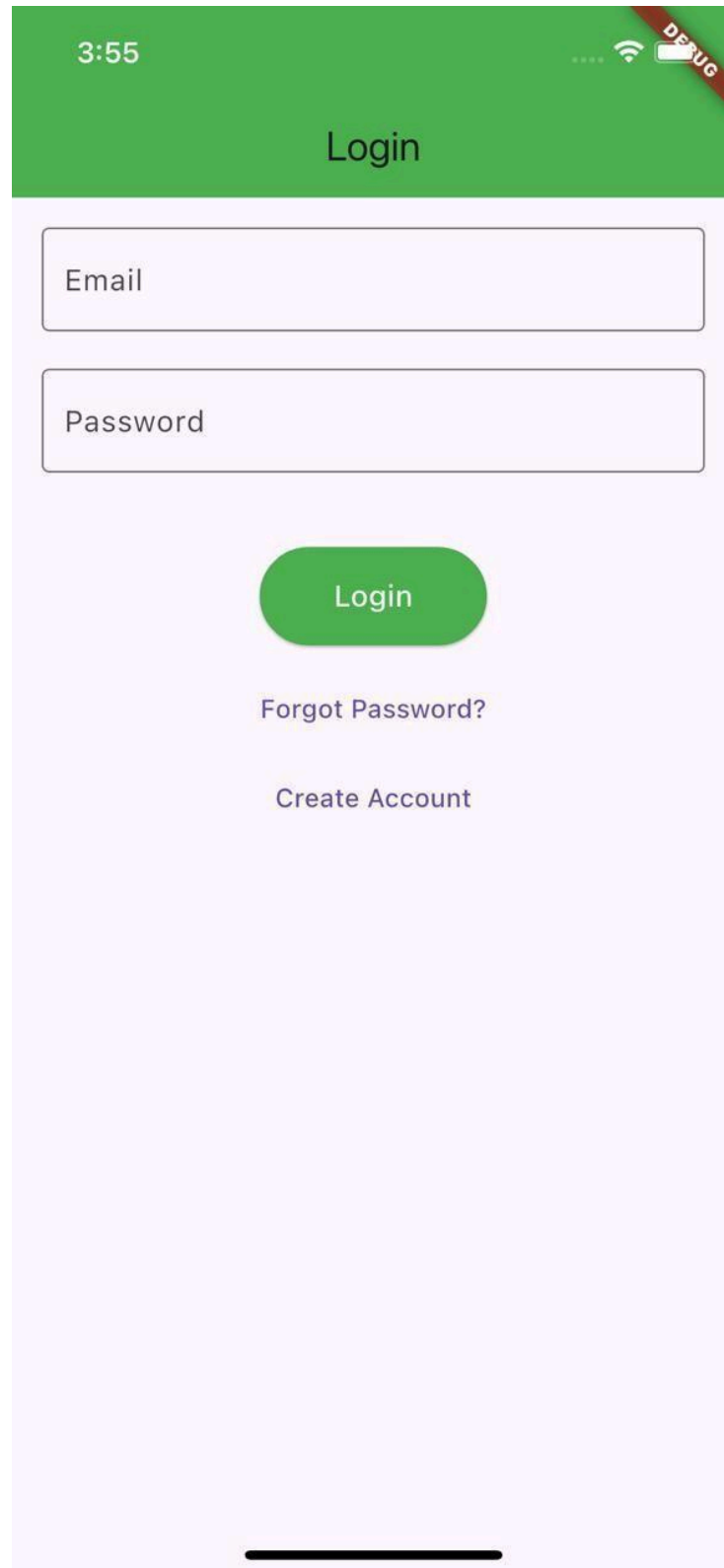


Fig 6.2.2 Login page

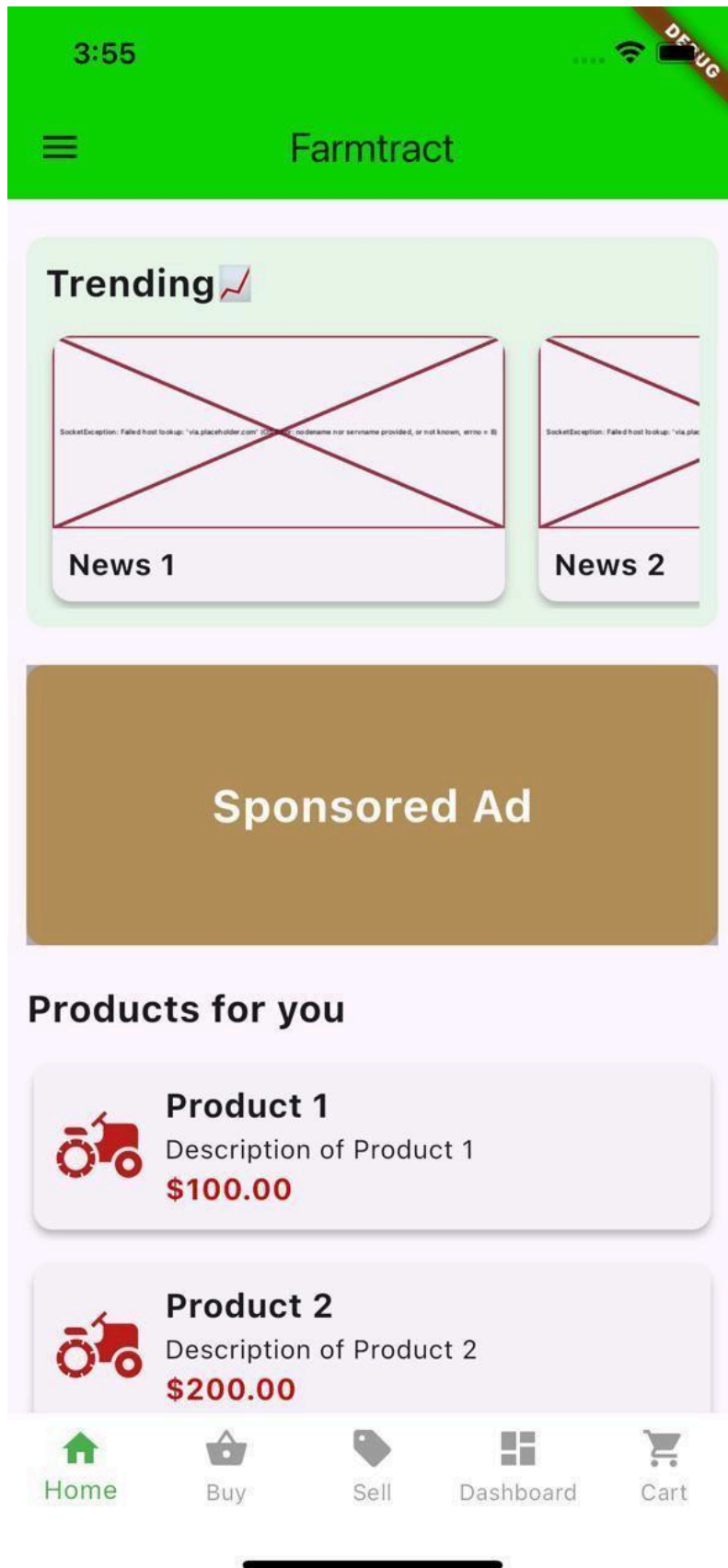


Fig 6.2.3 Home screen

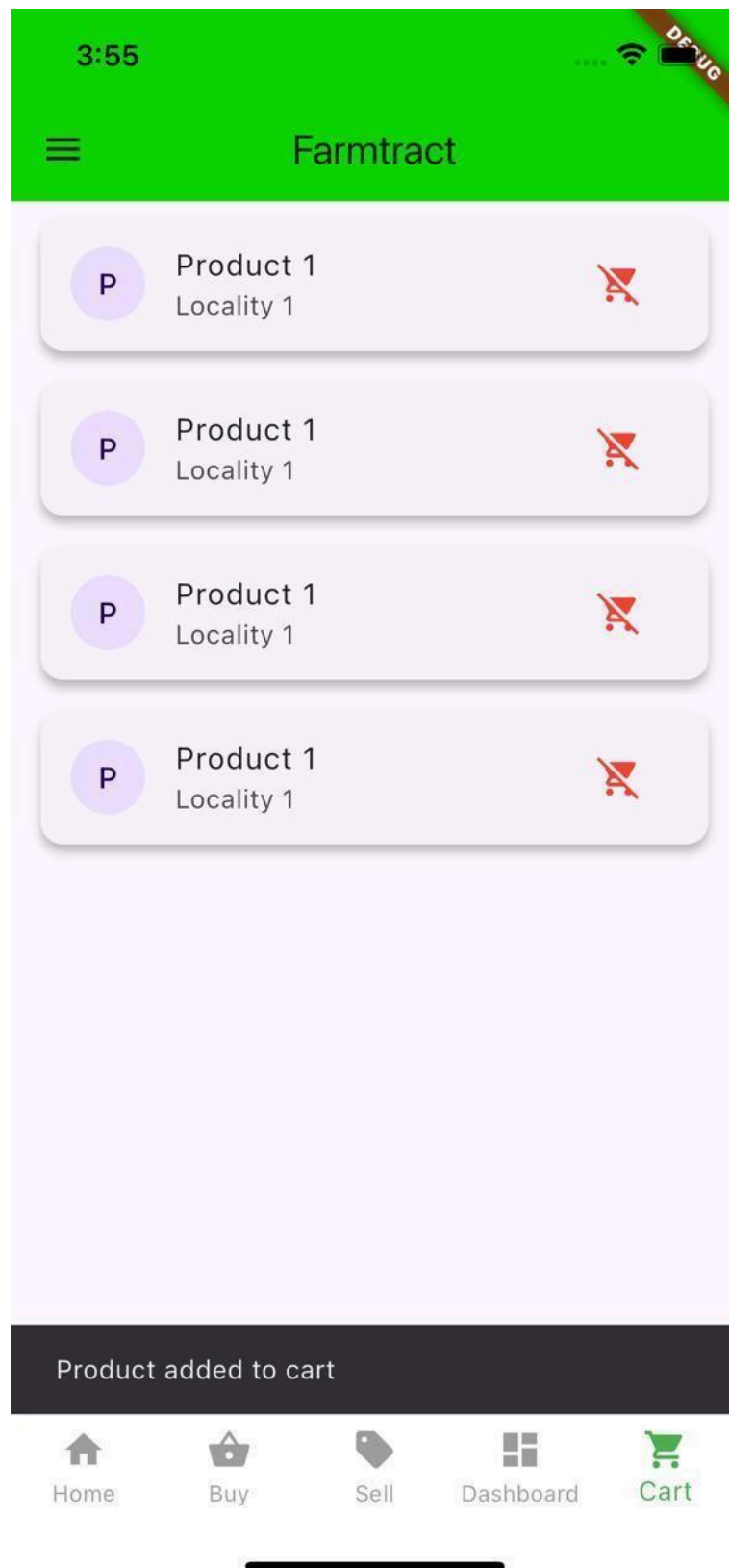


Fig 6.2.4 Cart

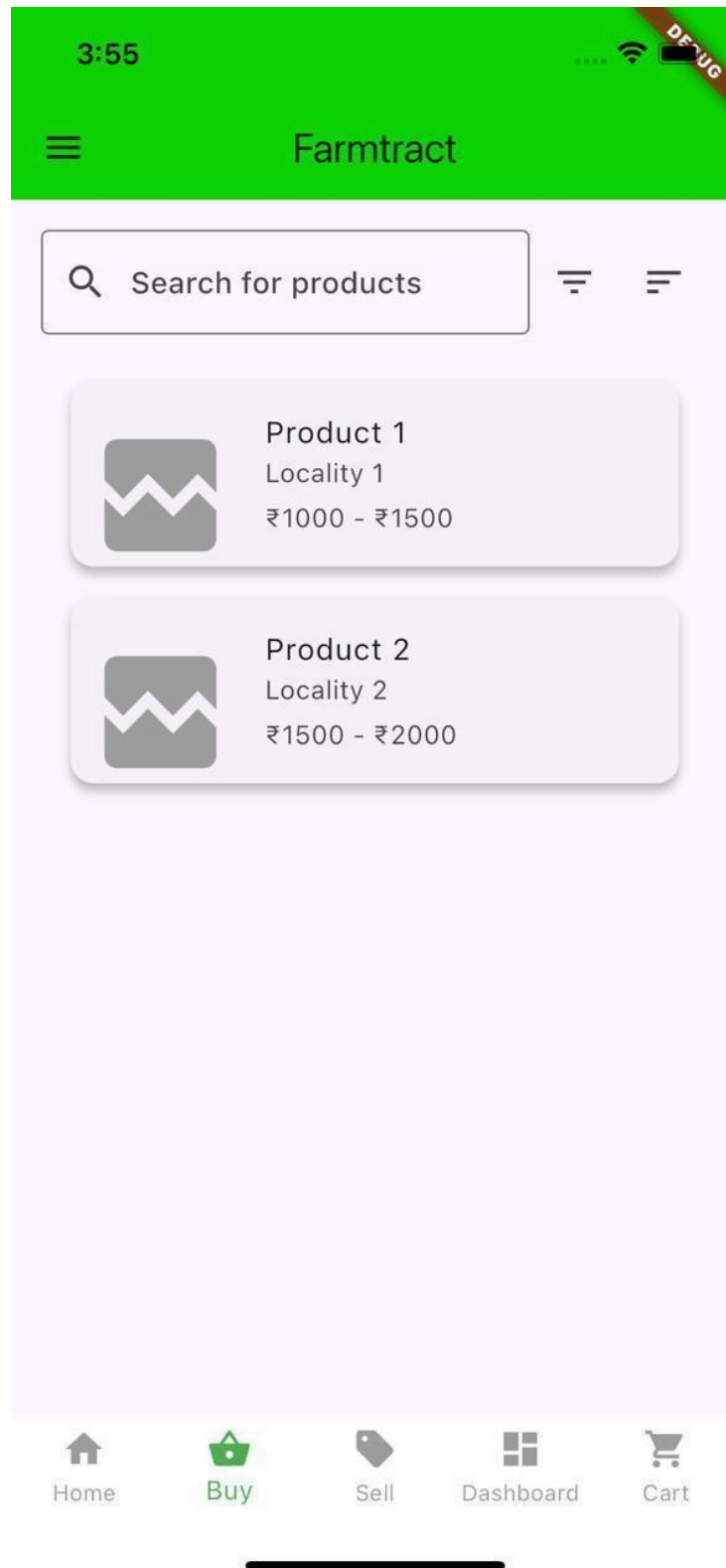


Fig 6.2.5 Buy product

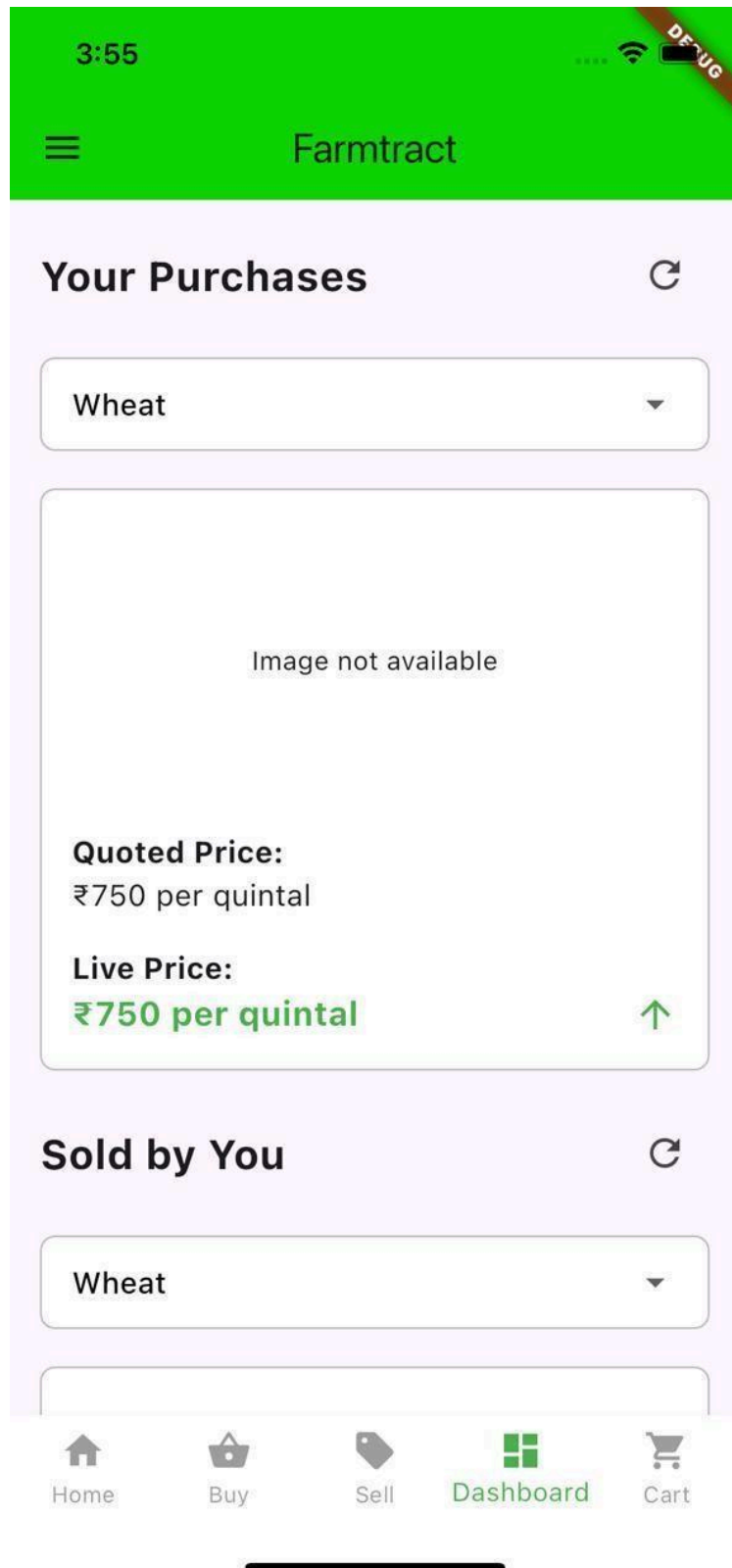


Fig 6.2.6 Dashboard

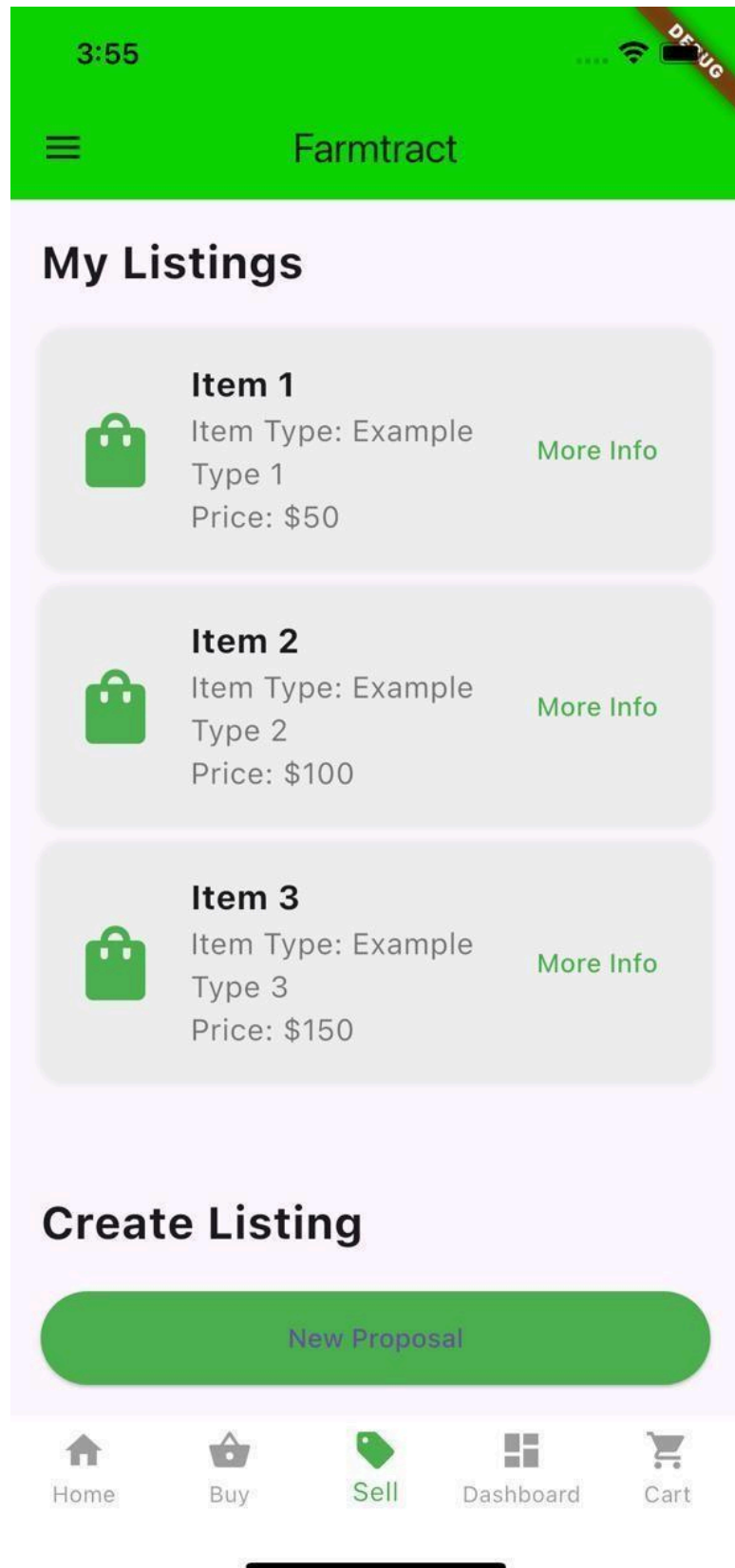


Fig 6.2.7 Sell product

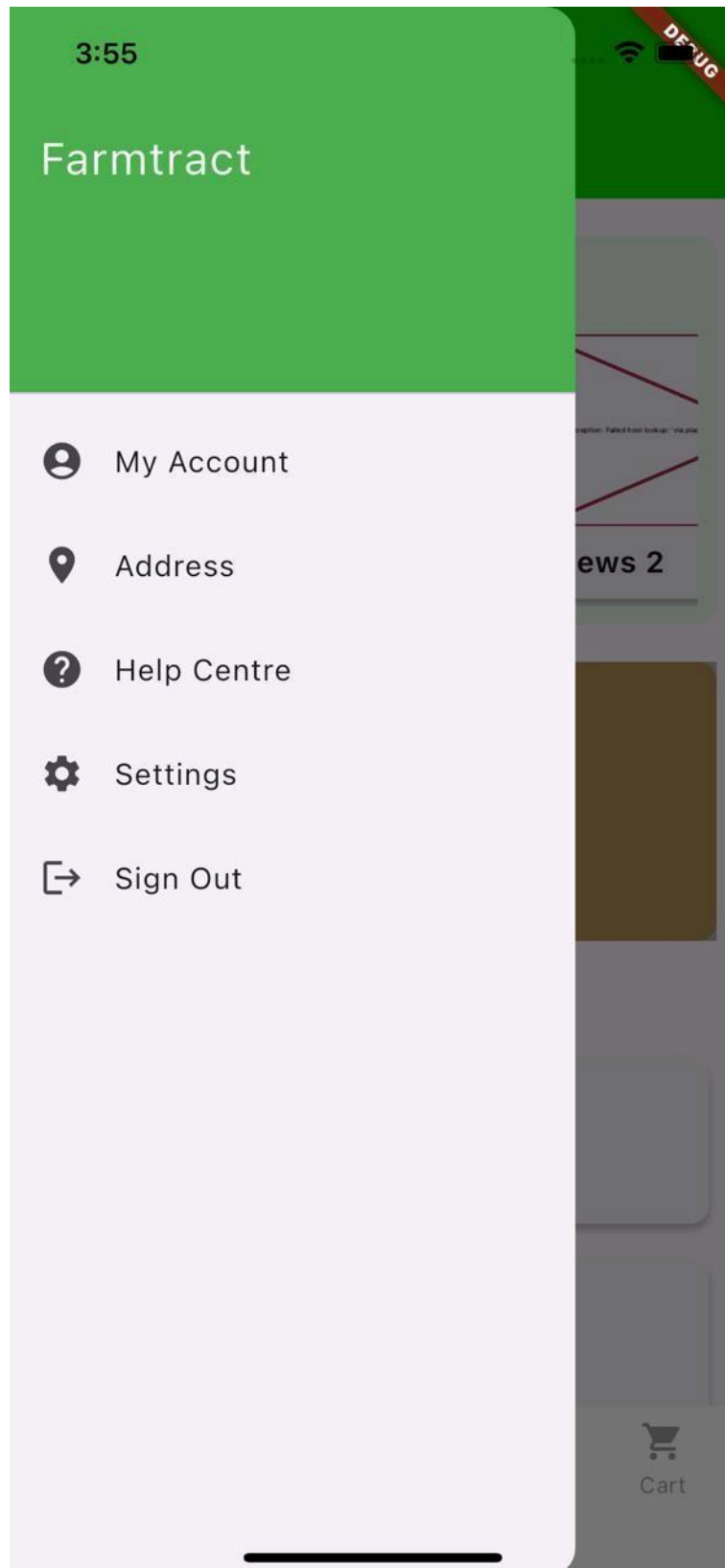


Fig 6.2.8 Menu

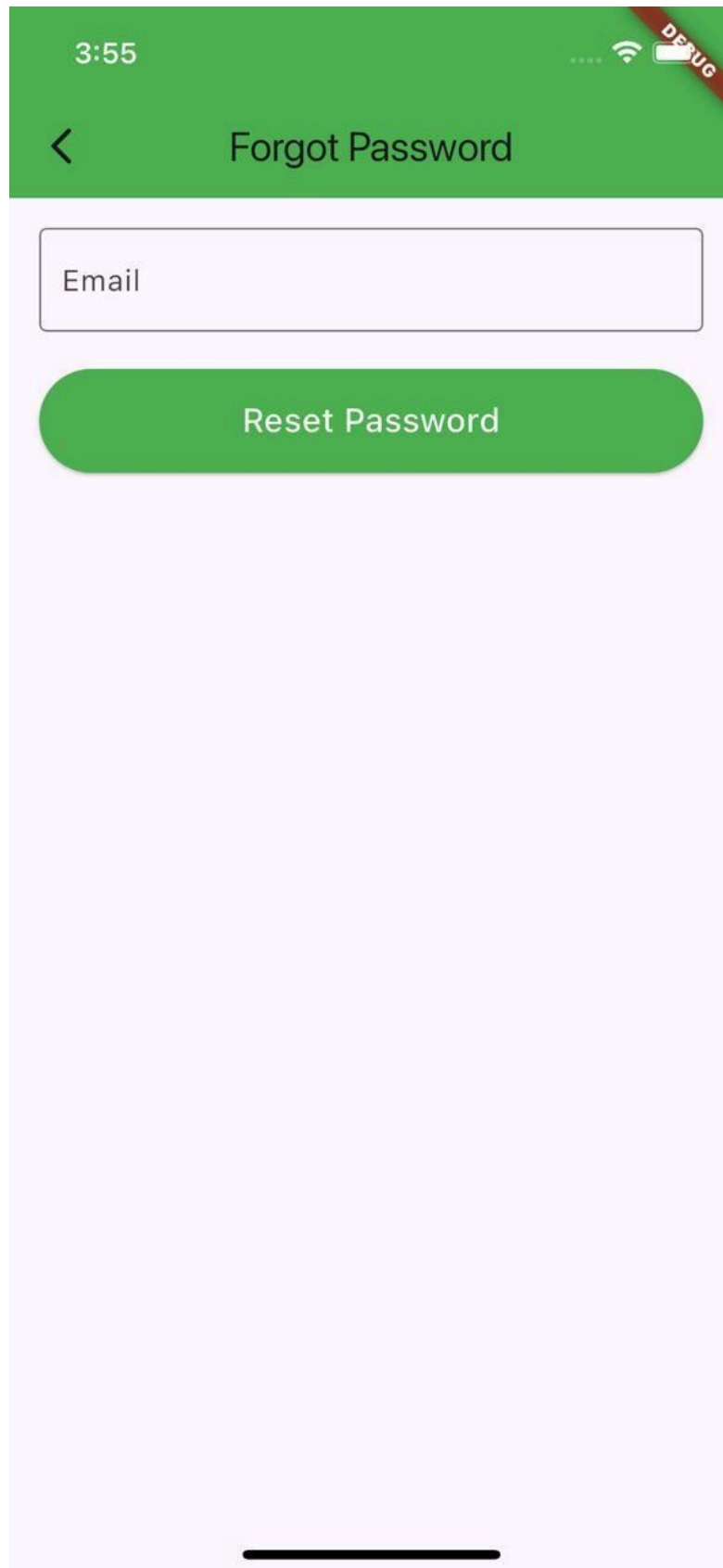


Fig 6.2.9 Forgot password

CHAPTER 7

CONCLUSION AND FUTURE ENHANCEMENT

7.1 CONCLUSION

FarmTract is a practical solution designed to assist farmers in tracking and managing their agricultural activities. The application offers features for recording planting schedules, harvesting dates, and equipment usage, helping farmers to stay organized. With the integration of local data storage, it ensures offline accessibility and security, preserving user privacy. Its user-friendly interface and intuitive design make it an ideal tool for farmers who need a simple yet efficient way to track their farm-related tasks, leading to improved productivity and resource management.

7.2 FUTURE ENHANCEMENT

- Implement weather integration to provide real-time forecasts for farmers based on their location.
- Add GPS tracking for better management of farm boundaries and machinery location.
- Enable crop health monitoring through image recognition or data input (e.g., for pest control or irrigation).
- Introduce a report generation feature for analyzing farm productivity and outputs.
- Include multi-language support to cater to a broader farming community.
- Enhance notification system to alert users of task deadlines, weather changes, or crop conditions.

REFERENCES

- [FAO Contract Farming Toolkit](#)
- [NCBI Article on Agricultural Digitization](#)
- [ScienceDirect Study on Farm Contracts](#)