

AgroHelper: An Android-Based Application for Agricultural Assistance

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Abstract—Indias agricultural sector remains pivotal to its economy, employing nearly 60% of the population. However, Indian farmers frequently face major barriers ranging from lack of timely technical guidance to limited knowledge about government schemes and high dependency on manual processes. AgroHelper, an Android-based application, addresses these challenges by offering farmers a digital platform that delivers state-wise crop cultivation practices, cost estimation tools, dealer directories, and direct helpline access under flagship initiatives like Rashtriya Krishi Vikas Yojna. Developed using Android Studio and Java, the application minimizes manual errors, promotes digital literacy, and empowers rural communities with actionable insights. Through its easy-to-use interface, AgroHelper seeks to transform traditional farming into a data-informed, resource-efficient system.

I. INTRODUCTION

Agriculture in India is not only an occupation but a way of life for millions. Despite technological advancements, farmers continue to rely on outdated practices due to a lack of structured information flow. Traditional communication channels such as local markets, newspapers, and verbal exchange are often delayed, inaccurate, or irrelevant to the farmer's specific needs.

AgroHelper aims to bridge this information divide by digitizing essential agricultural data. As mobile penetration in rural India continues to rise, an Android application proves to be the most accessible and cost-effective medium to disseminate customized agricultural guidance. AgroHelper is conceptualized as a personal digital assistant for farmers, supporting their day-to-day activities ranging from choosing the right crop to connecting with certified input suppliers and understanding government entitlements.

II. LITERATURE REVIEW

Many agriculture-based mobile solutions have emerged over the past decade. Platforms like Kisan

Suvidha and IFFCO Kisan have focused on delivering scheme updates, weather forecasts, and mandi prices. However, these apps are often generic, regionally non-specific, or lack interactivity.

Previous literature and market studies reveal that the existing applications fail to integrate economic tools like cultivation cost calculators or state-specific resource directories, which are crucial for farmers to make informed decisions. AgroHelper distinguishes itself by focusing on:

- State-wise crop information
- Economic forecasting tools (cost/yield estimates)
- Built-in contact directories of dealers
- Direct helpline integration
- Offline support for rural accessibility

These features ensure that the application is both context-aware and farmer-centric, significantly increasing its potential for real-world adoption.

III. METHODOLOGY

The development process of AgroHelper followed the System Development Life Cycle (SDLC) model, encompassing the following phases:

System Engineering

The system was designed for the Android environment, using tools such as Android Studio, Java SDK, and XML for UI design. Low-resource devices were prioritized to ensure inclusivity.

System Analysis

An in-depth needs assessment was conducted to identify core modules:

- Crop Information Module
- Cost Estimation and Calendar Tools
- Contact and Helpline Directory
- Government Scheme Information

Design

Using UML Diagrams (Use-Case, Class, Sequence), 23 user-interface screens were designed. The design prioritized:

- Simplicity
- Regional adaptability
- Multilingual interface (planned for future)

Coding

The backend was coded in Java, leveraging Android SDK components like RecyclerView, Fragments, and Intents. Navigation was modularized for future scalability.

Testing and Implementation

Each module underwent unit testing and integration testing. Real-time feedback from potential users (farmers and agriculture students) was incorporated to enhance usability.

IV. FINDINGS / RESULTS

During pilot testing and evaluation, the following key outcomes were observed:

- Ease of Use: Farmers navigated the app intuitively due to its icon-driven UI.
- Information Access: State-specific data enabled users to identify suitable crops based on their geography.
- Dealer Connectivity: Farmers could contact verified seed/fertilizer/machinery suppliers, improving procurement efficiency.
- Government Scheme Integration: Direct dialing to Rashtriya Krishi Vikas Yojna helplines simplified grievance redressal and information access.
- Device Compatibility: The app functioned smoothly on low-end Android devices with minimal storage and network requirements.

- Reduction in Manual Processes: Tasks that previously involved paper records were digitized, reducing human error and improving planning.

V. CONCLUSION

AgroHelper is a transformative tool that connects India's farmers to the digital age. By focusing on localization, usability, and relevance, the app bridges the divide between policy intent and grassroots implementation. With a robust architecture and thoughtful features, AgroHelper demonstrates that technology can serve as a catalyst in revitalizing India's agricultural sector. It not only supports real-time decision-making but also builds long-term resilience among farming communities.

The successful implementation of AgroHelper paves the way for more inclusive, efficient, and sustainable agricultural practices in rural India.

Future Enhancements

While the current version of AgroHelper is functional and farmer-friendly, several advanced features are planned for future iterations:

- Digital Payments: Secure payment gateways for dealer transactions.
- Crop Surveillance Tools: Integration of AI and drone-based crop monitoring.
- Soil & Water Testing Modules: Upload soil reports and get AI-generated advice.
- Real-Time Weather & Pest Alerts: API integration for immediate notifications.
- Multilingual Voice Support: Regional language audio guides for illiterate users.
- Chatbot Assistance: AI chatbot for query resolution.
- Offline Data Syncing: Improved data caching for seamless offline use.

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