International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 13 Issue: 03 | Mar 2026 www.irjet.net p-ISSN: 2395-0072

Farmer Buddy App

Anagha Powar[1], Vumeshwari Dhotre[2], Siddhi Katkar[3] , Shreya Jadhav[4] ,Mrs.Smita.S.Jadhav[5]

[1]Student,Computer Engineering Dr.D.Y.Patil Polytechnic,Kolhapur,India
[2]Student,Computer Engineering Dr.D.Y.Patil Polytechnic,Kolhapur,India
[3]Student,Computer Engineering Dr.D.Y.Patil Polytechnic,Kolhapur,India
[4]Student,Computer Engineering Dr.D.Y.Patil Polytechnic,Kolhapur,India
[5]Professo,Computer Engineering Dr.D.Y.Patil Polytechnic,Kolhapur,Indi

---

Abstract -*In the agricultural sector, farmers often face challenges such as lack of timely crop information, unpredictable weather conditions, improper fertilizer usage, and limited access to market prices. Traditional farming practices depend heavily on experience, which may not always align with modern agricultural needs. To overcome these issues, the Farmer Buddy App is proposed as a mobile-based digital assistant designed to support farmers with real-time agricultural insights. The application provides crop recommendations, fertilizer and irrigation guidance, weather forecasts using Open Weather Map API, daily Mandi price updates, and a cost-profit calculator. The system is developed using Flutter for cross-platform mobile application development and Firebase/MySQL for backend data management. This user-friendly and affordable solution helps farmers make informed decisions, reduce risks, improve productivity, and increase profitability, thereby promoting smart and sustainable farming practices.*

Key Words**: **Smart Farming, Flutter, Agriculture App, Weather Forecast, Mandi Prices, Crop Recommendation, Firebase

1. INTRODUCTION

Agriculture is one of the most important sectors in developing countries, especially in India, where a large portion of the population depends on farming for their livelihood. Despite being a backbone of the economy, many farmers still rely on traditional farming methods and limited sources of information. This makes them vulnerable to problems such as unpredictable weather conditions, improper crop selection, inefficient use of fertilizers and pesticides, and lack of awareness about current market prices.

In recent years, advancements in mobile technology and internet connectivity have opened new opportunities for improving agricultural practices. However, many existing agricultural applications provide only limited features or are difficult for rural farmers to use due to complex interfaces and lack of localized support. As a result, farmers often do not receive timely, accurate, and practical guidance required for effective decision-making.

The Farmer Buddy App is proposed as a smart digital assistant designed to support farmers by providing real-time and reliable agricultural information through a single mobile platform. The application offers features such as crop recommendations, fertilizer and irrigation guidance, real-time weather forecasts using APIs, daily Mandi price updates, and a cost-profit calculator. By integrating modern technologies such as Flutter for mobile app development, cloud-based databases, and API services, the app aims to bridge the gap between traditional farming practices and smart digital solutions.

The user-friendly design of the Farmer Buddy App ensures easy accessibility even for farmers with minimal technical knowledge. This project demonstrates how computer engineering solutions can be effectively applied to solve real-world agricultural challenges, enhance productivity, reduce risks, and contribute to sustainable and profitable farming.

2. Literature Survey

Agriculture has traditionally depended on farmers' experience, local knowledge, and advice from nearby sources. While these methods have been useful for many years, they lack scientific accuracy and real-time adaptability. As a result, farmers often face issues such as improper crop selection, inefficient fertilizer usage, and vulnerability to unpredictable weather conditions.

In recent years, several agricultural mobile applications have been developed to assist farmers. Applications such as Kisan Suvidha provide weather updates and market prices, while AgroStar focuses on agricultural inputs and advisory services. IFFCO Kisan offers expert guidance and information through mobile platforms. Although these applications are beneficial, they mainly address specific problems and do not provide a complete integrated solution.

Most existing systems lack personalized crop recommendations based on soil and regional conditions. They also do not include proper financial analysis tools such as cost-profit calculators. Additionally, many applications have complex user interfaces that are difficult for rural farmers to understand and use effectively.

The Farmer Buddy App aims to overcome these limitations by providing an integrated, simple, and farmer-friendly platform that combines crop guidance, weather updates, Mandi prices, and financial planning tools in a single application.

3. Proposed System

The Farmer Buddy App is proposed as an integrated digital platform designed to assist farmers in making informed agricultural decisions. The system combines multiple agricultural services into a single, easy-to-use mobile application, reducing dependency on traditional methods and external intermediaries.

In the proposed system, farmers register and log in to the application using a secure authentication process. After login, the user can access various modules such as crop recommendation, fertilizer and irrigation guidance, weather forecasting, Mandi (market) price updates, and a cost-profit calculator. Farmers can enter relevant details like soil type, crop information, and farming expenses, based on which the system provides suitable recommendations.

Real-time weather information is obtained through the OpenWeatherMap API, which helps farmers plan farming activities and protect crops from adverse climatic conditions. The Mandi price module provides daily updates of crop prices, enabling farmers to select the best market**2.**

Case-Based reasoning (CBR)

Case-Based Reasoning (CBR) is an artificial intelligence approach that solves new problems by referring to previously solved cases stored in a case base. Instead of depending only on predefined rules, the CBR technique compares the current problem with similar past cases and adapts the previous solutions to fit the new situation. This approach is highly suitable for agricultural applications where similar farming conditions and problems occur repeatedly with slight variations.

In the proposed Farmer Buddy App, Case-Based Reasoning is used to provide intelligent crop and fertilizer recommendations. The system maintains a database containing past farming cases such as soil type, weather conditions, crop selected, fertilizer usage, and yield results. When a farmer enters new input data, the system retrieves the most similar cases from the database. The retrieved solutions are then reused and adapted according to the current requirements. After implementation, the results are evaluated and stored as a new case in the case base. This continuous learning process improves the efficiency and reliability of the system over time.

The CBR approach enhances decision-making accuracy, reduces dependency on manual trial-and-error methods, and supports sustainable farming practices by utilizing real agricultural experiences.

Table1: Comparison of Crop Recommendation Parameters.

Parameter	Wheat	Rice	Cotton
Soil Type	Loamy	Clayey	Black Soil
Water Requirement	Medium	High	Medium
Temperature(^{0}C)	15-25	20-35	25-40
Fertilizer Type	NPK	Urea	Potash

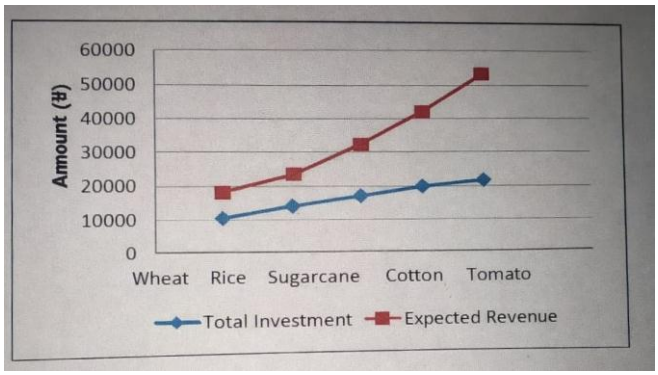

Chart -1: Comparison of Investment And Expected Revenue

This Chart represents the comparison between total investment and expected revenue for different crops. It helps farmers analyze profitability using the Cost-Profit Calculator module of the Farmer Buddy App.

Fig -1: Farmer Buddy App System Overview

The above figure Represents the overall system overview of the Farmer Buddy App. The mobile application interacts with the backend database and external APIs to provide crop recommendations, weather forecasts. Mandi prices, fertilizer guidance, and cost-profit analysis. The system

ensures real-time data processing and farmer-friendly decision support.

5. ADVANTAGES

•Uses previous experiences to solve new problems, making the system more practical and reliable.

•Reduces the need for complex rule-based programming, as solutions are derived from past cases.

•Improves accuracy over time by learning from new cases and storing successful solutions.

•Provides faster decision-making by retrieving similar cases instead of starting from scratch.

• Easily adaptable to real-world applications such as agriculture, medical diagnosis, and recommendation systems.

• Helps in handling incomplete or uncertain data by comparing it with similar past situations.

•Supports continuous learning, as new problem-solution pairs are added to the case base.

• In agriculture, it helps farmers by providing crop and fertilizer recommendations based on previous successful farming cases.

6. CONCLUSIONS

The Farmer Buddy App is designed as a smart and farmer-friendly digital assistant that helps farmers make informed agricultural decisions. By integrating features such as crop recommendations, fertilizer and irrigation guidance, real-time weather forecasting, Mandi price updates, and cost-profit analysis, the application addresses many of the challenges faced by farmers in traditional farming practices.

The use of modern technologies such as Flutter for mobile application development, cloud-based databases, API integration, and Case Based Reasoning enhances the efficiency and reliability of the system. The application provides timely and relevant information, reduces dependency on middlemen, and supports better planning and risk management.
Overall, the Farmer Buddy App demonstrates how digital solutions can be effectively applied to the agricultural sector to improve productivity, optimize resource utilization, and increase profitability. With future enhancements such as AI-based crop disease detection, IoT sensor integration, and voice-based assistance, the system has the potential to become a comprehensive smart farming solution that contributes to sustainable agricultural development.

7.REFERENCES

[1] D. Kornack and P. Rakic, “Cell Proliferation without Neurogenesis in Adult Primate Neocortex,” Science, vol. 294, Dec. 2001, pp. 2127-2130, doi:10.1126/science.1065467.

[2] M. Young, The Technical Writer’s Handbook. Mill Valley, CA: University Science, 1989.

[3] R. Nicole, “Title of paper with only first word capitalized,” J. Name Stand. Abbrev., in press.

[4] K. Elissa, “Title of paper if known,” unpublished.