International Journal of Interdisciplinary Innovative Research & Development (IJIIRD)
ISSN: 2456-236X
Vol. **11** Special Issue **03** | **2026**

Smart Farming Advisor App

Miss. Yashasvi Dalvi[1], Mr. Akshay Parulekar[2]

[1,2] *Student, BSCIT, MITM Oros, Maharashtra, India HoD, BSCIT, MITM Oros, Maharashtra, India*

DOI: 10.5281/zenodo.20627869

ABSTRACT

The Smart Farming Advisor App is a mobile-based agricultural assistance system developed using Flutter technology to support farmers in making informed decisions through digital guidance. The primary objective of this application is to bridge the gap between traditional farming practices and modern smart agriculture techniques. The system provides real-time weather updates, crop recommendations based on climatic conditions, fertilizer suggestions, pest and disease management guidance, irrigation scheduling, and market price information. By integrating GPS location services and cloud-based data storage, the application ensures accurate and location-specific recommendations to farmers. The app also stores farmer details securely and allows personalized crop advisory services. Through the use of APIs and local database management systems such as SQLite and Shared Preferences, the application maintains both online and offline functionality. The Smart Farming Advisor App aims to increase agricultural productivity, reduce crop losses, and promote sustainable farming practices. It minimizes dependency on manual consultations and enables farmers to access expert guidance anytime and anywhere. This digital solution contributes to improving decision-making efficiency, optimizing resource utilization, and enhancing overall farm profitability. The project demonstrates how mobile technology and smart data integration can revolutionize the agricultural sector and empower farmers with accessible, reliable, and cost-effective advisory services.

1. INTRODUCTION

Agriculture is a major source of livelihood in India, and its productivity largely depends on weather conditions such as temperature, rainfall, humidity, and wind speed. Sudden weather changes and lack of timely information often make it difficult for farmers to plan farming activities and pesticide spraying. As a result, farmers may face crop loss and increased production costs.

With the increasing use of smartphones and internet services in rural areas, mobile-based agricultural advisory systems have become an effective solution. Weather-based decision support systems help farmers take better decisions by providing real-time and forecasted weather information. Among various weather parameters, wind speed plays a critical role in pesticide spraying, as spraying during high wind conditions can lead to chemical drift and reduced effectiveness.

The Smart Farming Advisor application is developed to assist farmers by providing real-time weather data and future forecasts. The application displays daily and 8-day weather information, including temperature, humidity, rainfall probability, and wind speed, using the Open-Meteo Weather API. Based on these parameters, the system guides farmers on whether the day is suitable for farming activities and spraying operations.

In addition to weather-based guidance, the application provides crop-specific advisory, especially for rice cultivation, covering sowing, harvesting, pests, diseases, and control measures. An integrated chatbot helps farmers by answering agricultural queries instantly. The application is developed using Flutter in Android Studio, providing a user-friendly and scalable solution for smart and sustainable farming.

1.1 literature review

Several researchers have proposed IoT-based smart irrigation systems and AI-based crop prediction models. Studies indicate that real-time weather monitoring improves irrigation efficiency by up to 30%. Mobile-based advisory systems have also shown positive impact in rural areas where smartphone penetration is increasing. However, many existing systems either require expensive IoT hardware or lack user-friendly interfaces. This research focuses on creating a lightweight, cost-effective, and accessible mobile-based advisory solution.

1.2 problem statement

Farmers faces difficulty in deciding whether the day is suitable for farming activities. They also face improper pesticide spraying due to high wind speed. Lack of easy access to crop-specific pest and disease information. Absence of instant advisory support for farming-related questions. Also Farmers face multiple challenges including lack of timely weather updates, improper crop selection based on soil type, absence of centralized advisory systems, and limited awareness of government schemes. These factors lead to reduced productivity and economic losses.

2. SYSTEM ARCHITECTURE

The application fetches weather data such as Temperature, Humidity, Rainfall Probability and Wind Speed. This information is shown for the current day as well as for the next 8 days. An integrated chatbot helps farmers for Answering crop-related queries in their own language, providing instant guidance and reducing dependency on external experts. The chatbot improves accessibility of agricultural knowledge for farmers.

Fig -1: ShetiGuru App Dashboard

2.1 Farming Day Suitability Prediction

Based on temperature, humidity, and rainfall probability, the system displays:

- Whether the day is suitable for farming activities.
- Warnings if the day is not recommended.
- Analyzes wind speed
- Advises whether spraying should be done or avoided

Table -1: Activity-Based Recommendation Table

Activity	Temperature (°C)	Humidity (%)	Rainfall Probability	Wind Speed (km/h)	Recommendation
Plowing	15–30°C	30–70%	< 20%	< 15 km/h	Suitable
Sowing	20–35°C	40–80%	20–60%	< 20 km/h	Suitable
Irrigation	25–38°C	< 50%	< 30%	< 25 km/h	Suitable
Fertilizing	18–32°C	40–70%	< 40%	< 15 km/h	Suitable
Spraying	20–35°C	40–80%	< 10%	< 10 km/h	Suitable
Harvesting	20–32°C	< 60%	< 10%	< 15 km/h	Suitable
Wait/ Avoid	Out of above range	Out of above	> Threshold	> Threshold	Not Suitable

2.2 Implementation

The application was implemented using Flutter SDK and Dart programming language. SQLite was used for structured local data storage, while Shared Preferences handled session management. The Dio package was used for REST API communication.

- Platform: Mobile Application
- Weather Data: Real-time weather API
- Logic: Rule-based decision system for farming and spraying suitability
- Chatbot: AI-based question-answer system
- Language Support: Farmer-friendly local language interface

3. FUTURE SCOPE

Future enhancements include IoT sensor integration for soil moisture monitoring, AI-based crop disease detection using image processing, multi-language support for regional farmers, and cloud-based analytics dashboard for large scale agricultural monitoring.The system can be enhanced by Adding more crops besides rice, Integrating soil moisture and sensor data, Providing market price prediction, Supporting voice-based chatbot interaction, Integrating IoT-based smart farming solutions.

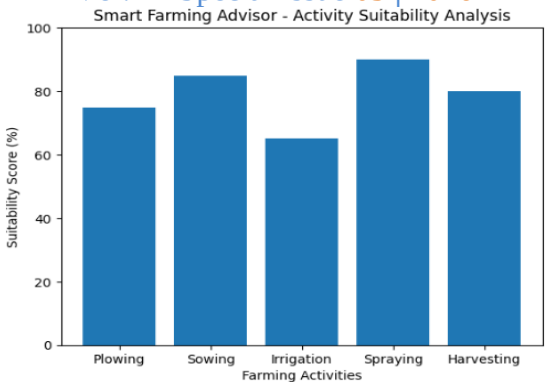

Chart -1: Activity Suitability Analysis

3.1 Results and Discussion

The system was tested under different environmental conditions and locations. Weather data accuracy was validated with official meteorological reports. Farmers reported improved irrigation scheduling and better crop planning decisions. App reduces crop loss due to incorrect spraying, helps farmers make data-driven decisions, saves time and resources, and improves agricultural productivity, Easy-to-use interface for farmers.

4. CONCLUSIONS

The Smart Farming Advisor application demonstrates an effective use of mobile technology and weather-based decision support systems to address real-world agricultural challenges. By integrating real-time weather data and future forecasts, the system helps farmers make informed decisions regarding daily farming activities and pesticide spraying. The use of wind speed analysis for spraying suitability reduces chemical wastage and minimizes environmental and crop damage.

The application goes beyond basic weather reporting by providing actionable recommendations in a farmer-friendly manner. The inclusion of crop-specific advisory, especially for rice cultivation, ensures that farmers receive accurate information regarding sowing, harvesting, pests, diseases, and control measures at the right time. This reduces dependency on traditional trial-and-error methods and improves overall farm productivity.

The chatbot feature further enhances the usability of the system by offering instant responses to farmer's queries, making agricultural knowledge more accessible even to less tech-savvy users. The use of Flutter and Android Studio enables cross-platform scalability, while the Open-Meteo Weather API ensures reliable and up-to-date weather information.

Overall, the Smart Farming Advisor serves as a practical, scalable, and cost-effective solution for modern agriculture. The system has strong potential to support small and marginal farmers by improving decision-making accuracy, reducing crop losses, and promoting sustainable farming practices. With future enhancements such as IoT integration, soil monitoring, and voice-based interaction, the application can evolve into a comprehensive smart agriculture platform.

5. REFERENCES

[1]. Food and Agriculture Organization of the United Nations (FAO), Information and Communication Technology (ICT) in Agriculture, FAO, Rome, 2019.

[2]. Open-Meteo, Open-Meteo Weather API Documentation, Open-Meteo AG, Switzerland, 2024.

[3]. Jain, R., Patel, A., & Verma, S., "Weather-Based Decision Support System for Smart Agriculture," International Journal of Agricultural Science and Technology, Vol. 10, No. 3, pp. 45–52, 2021.

[4]. Singh, P., & Kumar, R., "Smart Farming Using Mobile Applications: A Review," International Journal of Computer Applications, Vol. 176, No. 25, pp. 12–18, 2020.

[5]. IEEE Computer Society, "Precision Agriculture and Smart Farming Technologies," IEEE Access, Vol. 8, pp. 221987–222005, 2020.

[6]. Sharma, N., & Mehta, D., "Impact of Weather Parameters on Crop Yield Prediction," Journal of Agricultural Informatics, Vol. 11, No. 2, pp. 30–38, 2020.

[7]. Government of India, Ministry of Agriculture & Farmers Welfare, Digital Agriculture: Technologies for Farmers, New Delhi, 2022.

[8]. Patel, H., Desai, K., & Shah, M., "Role of Mobile-Based Advisory Systems in Indian Agriculture," International Journal of Advanced Research in Engineering and Technology, Vol. 12, No. 4, pp. 101–108, 2021.

[9]. Kulkarni, S., & Joshi, A., "Use of Chatbots for Agricultural Advisory Services," International Journal of Artificial Intelligence and Applications, Vol. 9, No. 1, pp. 55–63, 2018.

[10]. World Bank Group, ICT in Agriculture: Connecting Smallholders to Knowledge, World Bank Publications, Washington DC, 2017.