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# AI Powered Crop Management System

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**ABSTRACT**: This Android application is designed to assist farmers in making informed agricultural decisions. It features four key modules: crop categorization and crop guide which provides detailed growth information along with price and production data, a crop recommendation system based on environmental factors, a disease detection tool using image recognition and machine learning, and an AI-powered chatbot for farming-related queries. By integrating artificial intelligence with a user-friendly interface, the app helps farmers improve productivity, minimize crop losses, and adopt more sustainable farming practices.

**KEYWORDS**: Disease detection, Crop Recommendation, AI Chatbot, Sustainable Farming ,Crop Data.

## I. INTRODUCTION

Agriculture is a crucial sector that supports food production and sustains millions of livelihoods. However, farmers often encounter difficulties in selecting the right crops, managing soil conditions, identifying plant diseases, and obtaining timely agricultural guidance. Traditional farming methods rely heavily on experience and local knowledge, which may not always be accurate or up to date. To address these challenges, technology-driven solutions are becoming essential in modern farming.

This Android application is designed to assist farmers by integrating artificial intelligence and data-driven insights into agricultural practices. It includes four key modules: Crop Information, which categorizes crops and provides essential details about their growth needs; Crop Recommendation, which suggests suitable crops based on environmental factors like rainfall, soil pH, temperature, and climate conditions; Crop Disease Detection, which leverages machine learning and image recognition to diagnose plant diseases and recommend effective treatments; and an AI Chatbot, which serves as a virtual assistant, answering queries related to farming techniques, pest control, and crop management.

By offering real-time agricultural support through an intuitive interface, this app empowers farmers to make informed decisions, reduce crop losses, and enhance productivity. It promotes sustainable farming practices by enabling efficient resource utilization and helping farmers adopt modern agricultural techniques.

## II. RELATED WORK

In recent years, several technological advancements have been made to support farmers in improving agricultural practices. Various mobile applications and digital platforms have been developed to provide farmers with real-time information on crop selection, soil health, weather conditions, and pest control. Some existing systems use data analytics and artificial intelligence to recommend suitable crops based on environmental factors.

Several research studies have focused on crop disease detection using image processing and machine learning techniques. Applications incorporating deep learning models have been developed to identify plant diseases from images and suggest possible treatments. Additionally, AI-powered chatbots are being integrated into agricultural systems to assist farmers with their queries on crop management, irrigation, and pest control.

While these advancements have significantly improved farming efficiency, many existing solutions lack user-friendly interfaces or comprehensive support for multiple agricultural needs in a single platform. This project builds upon these innovations by integrating crop information, recommendation, disease detection, and AI-driven
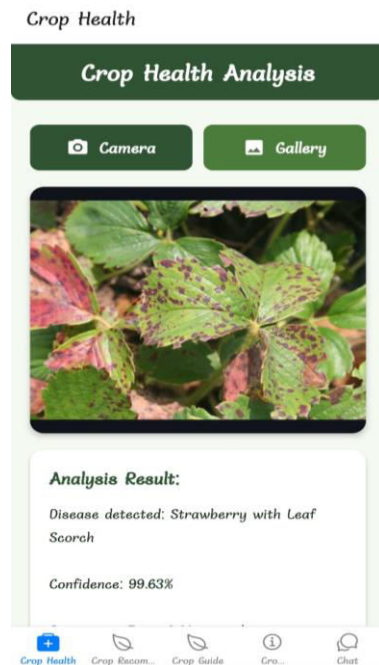
assistance into one mobile application. By combining machine learning and artificial intelligence, this app aims to provide a more accessible and effective tool for farmers to enhance productivity and sustainability.
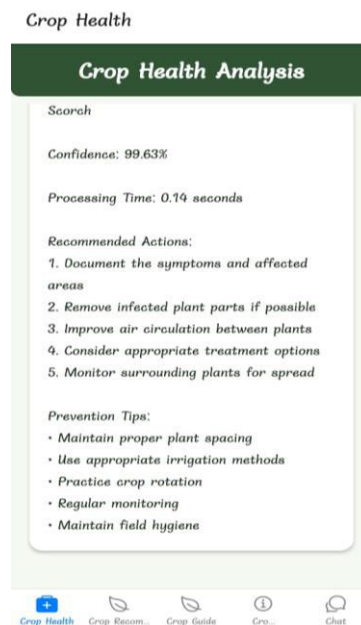
## III. METHODOLOGY

This Android application is structured into four main modules. The Crop Information Module classifies crops offering essential details on their growth conditions and benefits. The Crop Recommendation Module analyses user inputs such as rainfall, soil pH, humidity, and temperature to suggest the most suitable crops using predefined agricultural datasets. The Crop Disease Detection Module applies machine learning and image recognition to diagnose plant diseases from uploaded images and provides effective treatment recommendations. Lastly, the AI Chatbot Module utilizes natural language processing (NLP) to assist farmers with queries related to crop management, pest control, and irrigation. Designed with a user-friendly interface, the application ensures real-time, data-driven assistance to enhance farming efficiency and promote sustainable agricultural practices.
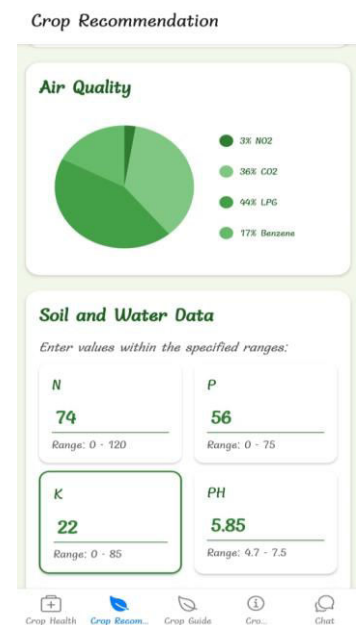
## IV. EXPERIMENTAL RESULTS

Figures shows the results of the application. Fig (a) and (b) shows disease detection of the crop from an image which is uploaded by the user. It shows the recommended actions along with the prevention tips by using Machine Learning and Image recognition algorithm. Figs. (c) , (d) and (e) shows the crop recommendation based on the data which is the user provides. Fig. (f) is the crop guide which gives the growing instructions along with farming practices. It also shows the difficulty level of the crop to cultivate. Fig (g) and (h) gives the price data and production data of the selected crop. The fig (i) is the AI Chatbot which is added to provide personal assistance to the farmers inorder to solve their queries.



(a)          (b)          (c)

(d)



(e)



(f)



(g)



(h)



(i)

## V. CONCLUSION

This Android application improves agricultural efficiency by offering crop information, recommendations, disease detection, and an AI chatbot for real-time support. Testing confirmed its accuracy and ease of use, enabling farmers to make better decisions, minimize losses, and practice sustainable farming. With further enhancements, it can greatly contribute to modernizing agriculture.0

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