

Yield Prediction Using Artificial Intelligence and Farming Chatbot System

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Abstract

Agriculture is an important sector in India, and farmers depend on environmental conditions for crop production. Selecting an unsuitable crop may result in low yield and financial loss. This paper presents an AI-based smart farming prediction system that helps farmers select suitable crops based on soil and weather conditions. The system uses machine learning techniques to analyze agricultural data such as soil type, rainfall, humidity, and temperature. Based on the given inputs, the system predicts the most suitable crop for farming. The system is designed to be simple and user-friendly so that farmers can easily use it. This approach can improve agricultural productivity and support smart farming.

1. Introduction

Agriculture plays a major role in the economic development of India. A large number of farmers depend on agriculture for their livelihood. Crop production mainly depends on soil quality and climatic conditions such as temperature, rainfall, and humidity.

Traditional farming methods depend on experience and assumptions. These methods are not always accurate and sometimes result in poor crop production. Farmers often face losses due to improper crop selection.

Modern technologies such as Artificial Intelligence and Machine Learning can help farmers make better decisions. Machine learning models can analyze agricultural data and predict suitable crops. This paper presents a smart farming prediction system that uses machine learning techniques to assist farmers in crop selection.

2. Problem Statement

Farmers often select crops without proper scientific analysis of soil and weather conditions. This may lead to low crop production and financial losses.

Small farmers usually do not have access to modern agricultural technology and expert advice. Therefore, there is a need for a simple and affordable system that can help farmers select suitable crops based on available data

3. Objectives

- The main objectives of this project are:
- To develop an AI-based smart farming system
- To predict suitable crops using machine learning
- To help farmers make better farming decisions
- To improve agricultural productivity
- To provide a simple and easy-to-use system

4. Existing System

In the existing system, farmers depend on traditional knowledge and local advice for crop selection. This method is time-consuming and not always accurate.

Farmers may select unsuitable crops due to lack of information about soil and weather conditions. The existing system does not provide automatic prediction and requires manual analysis.

The system uses a machine learning algorithm to analyze the input data. The model is trained using agricultural datasets.

Output Stage

The system predicts the most suitable crop based on the input values and displays the result to the user.

5. Proposed System

The proposed system uses Artificial Intelligence and Machine Learning techniques to predict suitable crops based on input data.

The user enters agricultural parameters such as soil type, temperature, rainfall, and humidity. The system processes the data using a machine learning model and predicts the most suitable crop.

The system provides fast and accurate results and helps farmers reduce farming risks.

5.1 Farming Chatbot System

The proposed system also includes a Farming Chatbot to assist farmers. The chatbot provides agricultural guidance such as crop information, fertilizer suggestions, and general farming advice. The chatbot interacts with users through a simple web interface and provides instant responses to farmer queries. This helps farmers get quick assistance without visiting agricultural offices.

6. Methodology

The system works in three main stages:

- Input Stage

The user enters input values such as:

- Soil type
- Temperature
- Rainfall
- Humidity
- Processing Stage

The collected dataset is preprocessed and cleaned before training the machine learning model. The model is trained using agricultural data and tested for prediction accuracy. In addition to crop prediction, the chatbot module processes farmer queries and provides appropriate responses.

7. Technologies Used

The following technologies are used in this project:

- Python Programming Language
- Machine Learning Algorithms
- Flask Framework
- HTML and CSS
- Database System

Python is used for implementing machine learning algorithms. Flask is used for developing the web application interface.

8. Results

The system successfully predicts suitable crops based on input values such as soil type and weather conditions.

The system provides fast results and is easy to use. The prediction accuracy depends on the dataset used for training.

The project was tested with different input values and the results were satisfactory.

The chatbot module was tested with different farmer queries and provided relevant responses successfully. The overall system performance was satisfactory.

9. Advantages

- Easy to use
- Fast prediction
- Accurate results
- Saves time
- Helps farmers

10. Future Scope

The system can be improved in the future by adding more features such as:

- Mobile application development
- Weather API integration
- Regional language support
- More accurate datasets

11. Conclusion

This paper presents an AI-based smart farming prediction system that helps farmers select suitable crops using machine learning techniques.

The system is simple and user-friendly and can help farmers improve crop production. Artificial Intelligence can play an important role in the future of agriculture.

12. References

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