CROP YIELD

1. Executive Summary:

This project aims to analyze agricultural data to predict crop yields. The results will help farmers optimize their crop production, making informed decisions on crop selection, fertilizer usage, and pesticide application based on predicted yields.

2. Problem Statement:

Background: Inaccurate crop yield predictions can lead to suboptimal use of resources, financial loss, and reduced agricultural productivity.

Objective: Predict crop yields using machine learning techniques.

Scope: Focus on a comprehensive dataset covering various crops, seasons, and states.

3. Data Sources:

The dataset containing columns: Crop, Crop_Year, Season, State, Area, Production, Annual_Rainfall, Fertilizer, Pesticide, Yield.

4. Methodology:

Data Collection: Get this data from Kaggle.

Data Preparation:

- Remove null values.
- Remove duplicate rows.
- Remove outliers.

Analysis Techniques: Linear regression and random forest regression.

Tools: Python (using libraries such as pandas for data manipulation, scikit-learn for modelling).

5. Expected Outcomes:

- Accurate prediction of crop yields.
- A robust model for future crop yield prediction.
- Recommendations for optimal crop selection, fertilizer usage, and pesticide application.

6. Risks and Challenges:

- Data quality issues may require extensive cleaning.
- The complexity of handling large datasets and model tuning may pose challenges.
- Inaccurate predictions could lead to suboptimal resource use; thorough validation is crucial.

7. Conclusion:

This project promises to provide significant value in agriculture by developing a reliable tool for crop yield prediction. The insights and predictive model generated will support farmers in making informed decisions about which crops to plant in different seasons, how much fertilizer and pesticide to use, and understanding the rainfall requirements for different crops. This will ultimately contribute to increased agricultural productivity, sustainable farming practices, and enhanced decision-making for both farmers and agricultural stakeholders.