**Project Proposal**

Smart Farming

Predicting Crop Yield: Enhancing Agricultural Efficiency and Reducing Food Insecurity

**Introduction**

Crop yield prediction is a crucial factor in ensuring the profitability of farmers. Predicting future crop yields can help farmers make informed decisions about planting and harvesting and optimize their crop yield. In this project, we will use R to analyze historical data on crop yields and weather patterns to predict future yields. To best advise farmers, we will focus on predicting crop yields of the ten most consumed crops in the world. Doing so will make our predictions applicable to a larger population as these are produced in great quantities to fulfill worldwide demand. Our dataset is sourced from [Kaggle](https://www.kaggle.com/datasets/patelris/crop-yield-prediction-dataset?select=yield_df.csv), which contains data from the FAO (<http://www.fao.org/home/en/>) and the World Data Bank (<https://data.worldbank.org/>).

**Objective**

The main objective of this project is to analyze historical data on crop yields and weather patterns and to develop a predictive model that accurately predicts future crop yields.

**Data Description**

**Dependent Variable**

|  |  |
| --- | --- |
| hg/ha\_yield | Area yield |

**Independent Variables**

|  |  |
| --- | --- |
| area | Country Name |
| item | Crop Name |
| year | Year when the crop was grown |
| avg\_rainfall | Average rainfall measured in mm/year |
| pesticides\_tonne | Pesticides used per tonne |
| avg\_temp | The average temperature when the crop was grown |
| nitrogen | Tonnes of nitrogen in the soil |
| phosphate | Tonnes of phosphate in the soil |
| potassium | Tonnes of Potassium in the soil |
| biomass\_burned | Reported tonnes of biomass burned in organic soils from wildfires |

**Expected Outcomes**

The expected outcomes of this project are:

* A predictive model that accurately predicts future crop yields.
* Insights into the correlation between crop yields and weather patterns.
* Recommendations on the most effective machine learning algorithms for crop yield prediction.

**Reasoning for Data Selection**

This project is interesting because predicting the amount of crops a land will produce will result in making field operations and administration more efficient, which inturn can help reduce food insecurity. Farmers can also mitigate risk by making informed decisions about planting and harvesting.

**Conclusion**

Crop yield prediction is a critical factor in ensuring the profitability of farmers. This project aims to use R to analyze historical data on crop yields and weather patterns to develop a predictive model that can help farmers make informed decisions about planting and harvesting.