# Machine Learning for Sustainable Development Goal 2: Zero Hunger

## 1. Introduction

Project Objective: The objective of this project is to develop an AI-driven solution that accurately predicts crop yields by analyzing weather patterns, soil health, and crop management techniques. By providing actionable insights to farmers, the project aims to enhance agricultural productivity and contribute to food security, ultimately reducing hunger in rural communities.

Motivation: The motivation behind using AI for Zero Hunger is to enhance agricultural productivity and efficiency in response to the growing global food demand and climate change challenges. By providing farmers with data-driven insights, the project aims to improve crop management, reduce waste, and ultimately alleviate hunger in rural communities.

## 2. Data Collection

Data Source: Kaggle Dataset (e.g., “Yield.df or Crop Yield Prediction Datasets”)

Dataset Description:  
- Features: area, item, year, hg/ha yield, average\_rain\_fall\_mm\_per\_year, pesticides\_tonnes, average temperature, labels.

## 3. Model Implementation

Data Splitting: Split dataset into 80% training and 20% testing sets using `train\_test\_split` from Scikit-Learn.

## 4. References

- Kaggle Dataset  
- Scikit-Learn Documentation

Problem Statement**:** An AI solution to predict crop yields and optimize farming practices based on weather patterns, soil health, and crop management techniques. The goal is to increase agricultural productivity and reduce hunger in rural communities.

**Solution :**

To address the challenges of crop yield prediction and optimize farming practices, we propose developing a machine learning model that analyzes weather patterns, soil health, and crop management techniques. This model will provide farmers with accurate yield forecasts, enabling them to make informed decisions about planting, resource allocation, and crop selection. By aligning agricultural productivity with community needs, this solution aims to enhance food security and promote sustainable farming practices in rural areas, ultimately contributing to the achievement of Zero Hunger.

Why I Choose This Problem :

I chose the problem statement of Zero Hunger because it represents a critical global challenge, with over 735 million people experiencing chronic hunger in 2022. Addressing this issue is vital not only for improving individual health and well-being but also for fostering economic development and educational opportunities. Hunger is intricately linked to other Sustainable Development Goals, making it essential to tackle it in order to achieve broader societal progress. Additionally, the increasing impacts of climate change and conflict on food security highlight the need for innovative solutions that can create sustainable food systems and enhance resilience in vulnerable communities. By focusing on Zero Hunger, I aim to contribute to meaningful change that can improve lives and communities worldwide.

Implementation:

The implementation of the Zero Hunger initiative involves promoting sustainable agriculture through practices like agroecology and crop diversification to enhance food production. It also includes leveraging technology and innovation, such as data analytics and precision farming, to optimize yields and reduce waste. Strengthening food distribution systems and ensuring equitable access for marginalized communities are crucial steps, alongside providing education and training for farmers on sustainable practices. Policy advocacy is essential to create supportive frameworks that address hunger, while community engagement ensures that solutions are tailored to local needs and contexts. Together, these strategies aim to create resilient food systems and eliminate hunger sustainably.

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