**Problem Statement**

This project focuses on analysing country-level data and building machine learning models to forecast CO₂ emissions based on a range of national indicators. It utilizes the publicly available *Climate Change Data* provided by the World Bank Group, which includes comprehensive data spanning multiple countries and years. The dataset encompasses a wide array of features such as:

* **Countries covered:** A majority of nations across the globe
* **Time frame:** Data from 1990 to 2011
* **Greenhouse gas emissions:** Including CO₂, CH₄, N₂O, among others
* **Demographic details:** Total population, urban population, population growth rate, etc.
* **Economic indicators:** GDP, GNI, foreign investments, etc.
* **Agricultural and land-related data:** Cereal yield, agricultural area, protected land zones, etc.
* **Climate metrics:** Precipitation levels, natural disaster counts, etc.
* **Energy consumption**
* **Healthcare-related statistics:** Number of medical professionals, etc.

The project workflow is divided into two major phases:

**Phase 1: Data Preprocessing and Structuring**

This phase is documented in a dedicated Jupyter Notebook (.ipynb) along with a corresponding PDF report. It includes:

* **Introduction:** Summary of the notebook and the project context, including data source information
* **Initial Setup:** Importing necessary libraries and loading the dataset
* **Dataset Overview:** A global perspective on the data available
* **Project Objectives:** Outlining the goals of the analysis
* **Data Cleaning Tasks:**
  + Addressing missing data
  + Converting non-numeric values into numeric formats
  + Renaming columns for clarity
  + Eliminating rows and columns lacking data
* **Data Transformation Procedures:**
  + Reshaping variables using data melting techniques
  + Merging different data subsets into a unified format
* **Handling Missing Entries:**
  + Identifying and filtering out missing values with minimal data loss
* **Final Step:** Exporting the cleaned and structured dataset for further analysis