

Exploring Global Trends:

COMPREHENSIVE CLIMATE ANALYSIS THROUGH CLUSTERING, PREDICTION, AND COMPARATIVE METADATA STUDY



Objective

Our objective is to conduct a comprehensive analysis using The World Bank Data on various indicators related to climate change. Through clustering methods, predictive models, and comprehensive visualizations, we aim to discern patterns, forecast trends, and explore correlations among diverse socio-economic indicators.

Analysis Methods Employed

1) Clustering Analysis:  
Conducted clustering analysis using KMeans to categorize countries based on selected indicators from 1960. Explored three distinct clusters highlighting diverse growth trajectories across countries.

2) Exponential Curve Fitting and Prediction:  
Utilized curve fitting to model exponential growth trends for specific indicators over time. Forecasted future indicator values with confidence intervals, enabling insights into potential trajectories.

3) Country Metadata and Comparative Analysis:  
Investigated country clusters based on region and income group using metadata analysis. Unveiled differences and commonalities among clusters to understand socio-economic variances.

Abstract

This poster presents a comprehensive analysis of climate change indicators utilizing The World Bank Data. The study encompasses crucial aspects such as CO2 emissions, access to electricity, agricultural land use, forest area, population growth, renewable energy consumption, urban population, and more. Our objective is to discern patterns, forecast trends, and explore correlations among socio-economic indicators through clustering methods, predictive models, and visualizations.

Cluster	Mean 1960 Indicator	Mean 2022 Indicator
0	8.66M	31.98M
1	2.10B	6.13B
2	524.23M	1.79B

THE WORLD BANK DATA AND CLIMATE CHANGE INDICATORS

The World Bank Data provides an extensive array of indicators encompassing vital aspects of climate change, including:

- CO2 Emissions
- Access to Electricity
- Agricultural Land Use
- Forest Area
- Population Growth
- Renewable Energy Consumption
- Urban Population, and more.

DETAILED FINDINGS

Clustering Analysis Insights

- Graph 1:** Demonstrated three distinct clusters showcasing varied developmental paths over the years. Cluster 1 notably stood out for exceptional growth.

Exponential Curve Fitting Analysis

- Graph 2:** Presented exponential models forecasting potential growth trends in specific indicators with associated confidence intervals.

Country Metadata and Comparative Analysis

- Graph 3:** Showed clusters based on region and income group, highlighting regional disparities and income distributions.

