Assignment : **ADS assignment 2 : Statistics and Trends**

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**Git hub Link**: <https://github.com/Ufelicita/ADS-2-STATS->

**Statistics and Trends: Comparative analysis of five indicators of climate change in Select countries in the world**

**Abstract:** Using Statictics and Visualisations, the correlation of five indicators and their impact on climate change in 10 selected countries from different continents in the world will be comparatively analysed. The indicators considered are Co2 emissions, Population Density, Population Total, Arable lands and GDP.

A graph with different colored lines

Description automatically generated

The Line plot was chosen for this analysis because it is better at showing trends. It shows CO2 emission data in the select countries from year 1990 to 2015.China and United States recorded the highest emissions at over 1 billion and 0.5 billion kt respectively in 2015. India recorded a slight increase from 2005 while United States decline slightly in 2005. The high rate of CO2 emission as compared to the other countries is related to the

high production rates in these countries. China’s population and its reliance on coal are major reasons for the recorded high emissions.

A graph of growth in countries/regions

Description automatically generated

The line plot shows that United state had the highest GDP at over $1.75 trillion dollars. Comparatively, China’s GDP began to increase steadily from 2005 and was highest in 2015 at over $1 dollars. Japan and Brazil recorded a slight decline from 2010. United States economic activities contributed a lot to climate change as shown in its high CO2 emissions within the years analysed. The Korea Rep, South Africa, Germany, Australia, Brazil’s relatively low GDP in 2015 reflects low economic activity which also is suggestive to have contributed to low CO2 emissions.

A graph of different colored bars

Description automatically generated

The Bar plot was chosen for comparative analysis The chart shows little or no correlation between population density and arable lands in all of the countries .Nevertheless , China , India and United States have the the highest arable land expanse of over 10,000, 14,200 and 16200 square meters respectively. While several variables could explain the lack of a noticeable relationship between arable land and population density, factors such as technology advances, agricultural methods, and land management strategies can alter arable land use efficiency, thereby separating it from population density patterns.Nevertheless , these countries if these countries adopt better farming praticises on these lands , it would reduce carbon relase to a great extent.

**Conclusion**

High CO2 emissions was noticed in China and United States with high GDP challenge expectations. Surprisingly, no correlation was seen between arable land and population density which indicates that there are complex interactions between the environment and the economy that go beyond traditional assumptions.

A screenshot of a graph

Description automatically generated

The correlation map shows moderate correlations among CO2 emissions, population, GDP, and Arable lands as well as GDP. However, is observed that no or little correlation seem to exist amongst population density, GDP, CO2 and Arable Land within the investigated period. This relates with the reason there is low emission in the Countries like South Africa, Brazil, Korea Republic and Germany. These Countries have sustainable practices in place to curb climate change. Factors such as population density that would have triggered carbon release through urbanisation becomes ineffective.