ASSIGNMENT 2: STATISTICS AND TRENDS

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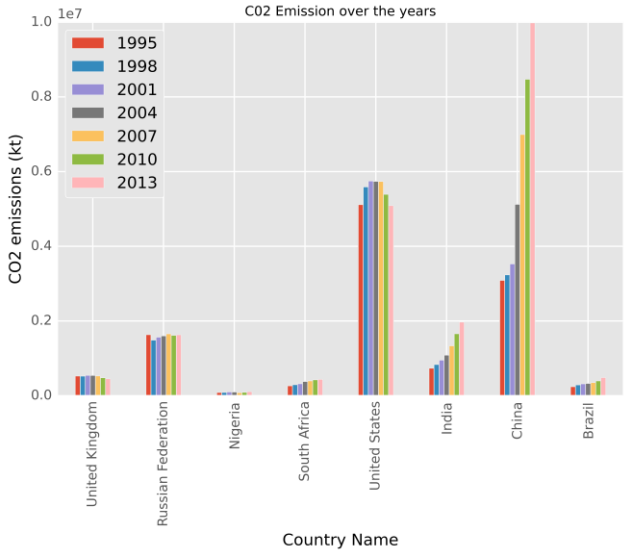
CLIMATE CHANGE DATA ANALYSIS ON URBAN POPULATION, CO2 EMISSIONS, ELECTRIC POWER CONSUMPTION AND ARABLE LAND AMONG EIGHT NATIONS FROM 1990 TO 2014.

ABSTRACT

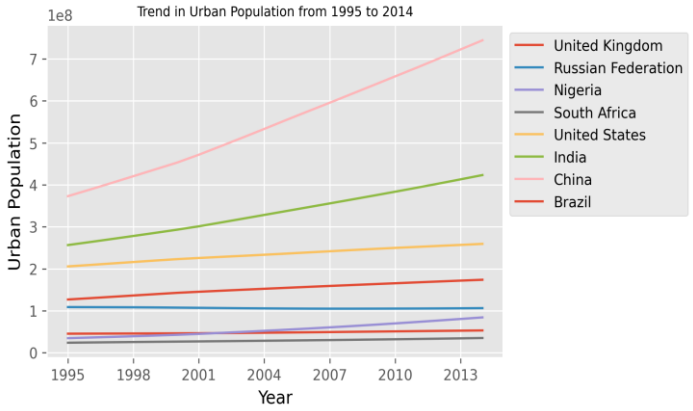
This study examines the impact of climate change on urban populations in eight nations from 1995 to 2014 by analyzing relationships among climate change indicators such as urban population, CO2 emissions, electric power consumption, and arable land. The study uses a combination of statistical and visual methods to explore trends in these variables over a 20-year period. The results reveal significant differences in CO2 emissions, electric power consumption, and arable land among the eight nations. The findings of this study can be used to better understand the impact of climate change on urban populations and some other indicators.

Chart 1



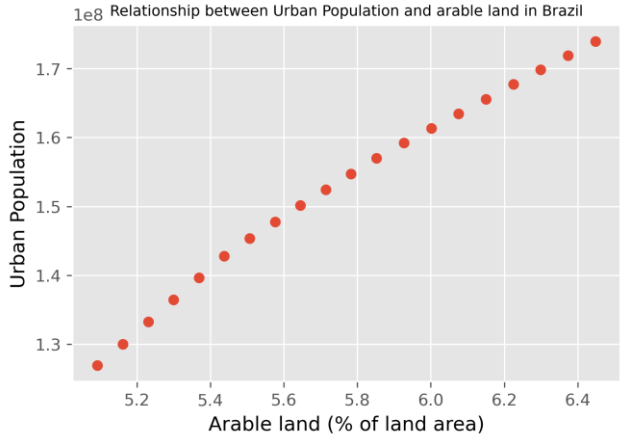
The above bar chart illustrates the carbon dioxide (CO2) emissions of various countries from 1995 to 2014 with a three-year increment. The data demonstrates an upward trend of CO2 emissions for China, India, South Africa, and Brazil. Notably, China has the highest CO2 production, which suggests a high level of activities that result in the release of CO2 into the atmosphere. This trend may be attributed to the increase in the urban population of China, as shown in the accompanying line graph.

Chart 2



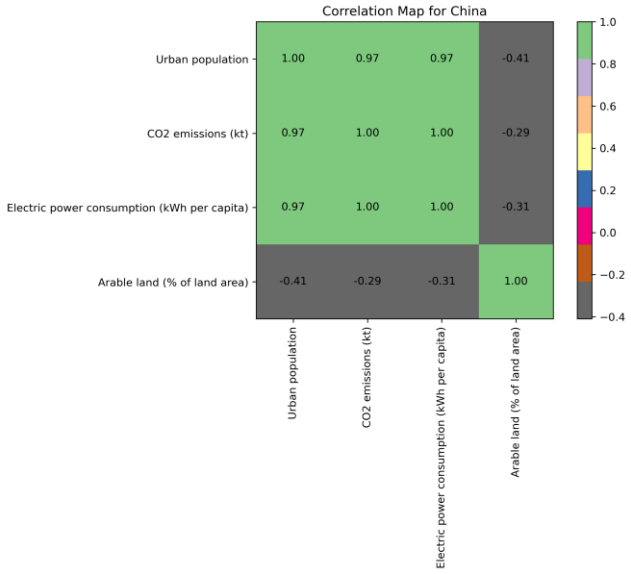
The presented line graph depicts the trend of urban population in several countries across different regions of the world. From the graph, it can be inferred that the world's population is on the rise, and various regions are experiencing significant developmental advancements, leading to an increase in urban population over time. China and India are at the forefront of this trend, with approximately 200% and 70% growth, respectively, within 15 years. The United States and Brazil also display growth in urban population. Finally, South Africa's urban population appears to have the least growth.

Chart 3



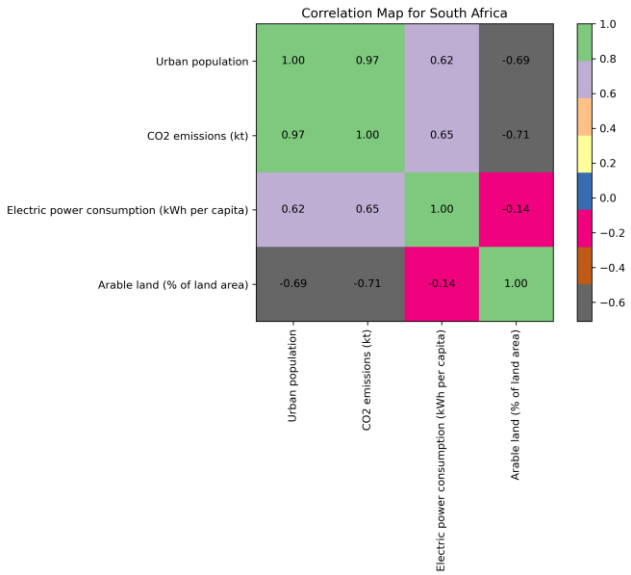
The upward trend of Brazil's urban population is evident in the line plot. This urbanization has various implications, including its impact on available farmland. As demonstrated in the scatter plot, there is a positive correlation between Brazil's urban population and its arable land. This may be a result of people migrating from rural to urban areas, leaving behind more land for agriculture. Nonetheless, this phenomenon has adverse effects on the environment and contributes to global climate change.

Chart 4



The correlation heatmap depicted above indicates that many of the indicators are positively correlated, implying that there are relationships between them and that changes in one indicator can influence the others. The high correlation coefficient value (0.97) between the growth in urban population and electric power consumption suggests that an increase in urban population leads to a rise in power usage. In contrast to Brazil, urbanization in China is accompanied by a reduction in arable land.

Chart 5



The correlation heatmap for South Africa indicates that arable land has no significant correlation with other indicators, with correlation coefficients ranging from -0.29 to -0.41. In contrast, there is a strong positive correlation between urban population and both CO2 emissions and electric power supply.

In conclusion, the line plot indicates an upward trend in urban populations and CO2 emissions for certain countries, which has detrimental consequences on global climate change. If measures are not implemented to address environmental pollution, these trends are expected to persist and increase over time. The impacts of climate change, such as extreme heat, heavy rainfall, and flooding, will have far-reaching effects on critical aspects of our lives, including agriculture, forestry, health transportation, and air and water quality. Urgent and stringent actions are required to safeguard our planet.