

## **7PAM2000 Applied Data Science 1**

### **Assignment 2: Statistics and trends**

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**GITHub repository:** <https://github.com/Sravanigooka11/ads-assignment-2>

#### **Abstract:**

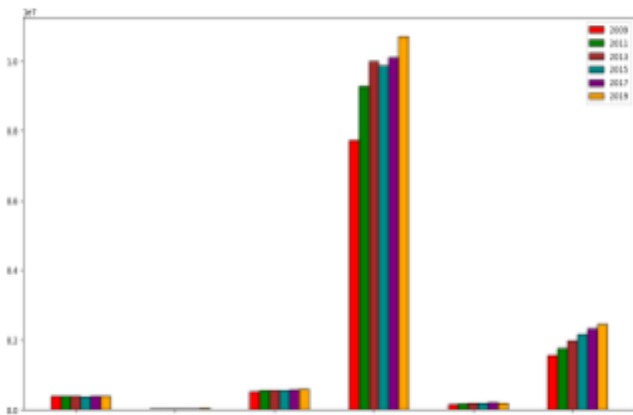
This research examines the relationship between the following climate changes: CO2 emissions, forest area, agriculture land, and arable land. The dataset under consideration comes from the World Bank's Data Repository. It includes six countries from 2009 to 2019. and the countries are Australia, Bahrain, Canada, China, the United Arab Emirates, and India.

#### **Introduction:**

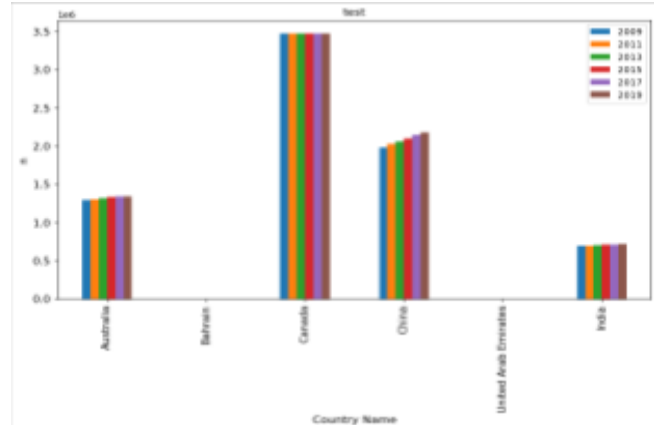
The data has been analysed through python programming using the pyplot module to visualise the trends in the dataset as well as to draw judgements. The ability to discover patterns and trends in the impacts of climate change across countries and years is the primary benefit of undertaking this data analysis. This paper discusses how CO2 emissions affect forest land areas, as well as comparison of agriculture land and arable land. These analyses' visualisations provide a clear and succinct breakdown of climate change across countries, making it simple to evaluate and grasp the data.

## Climate change data analysis based on World Bank data

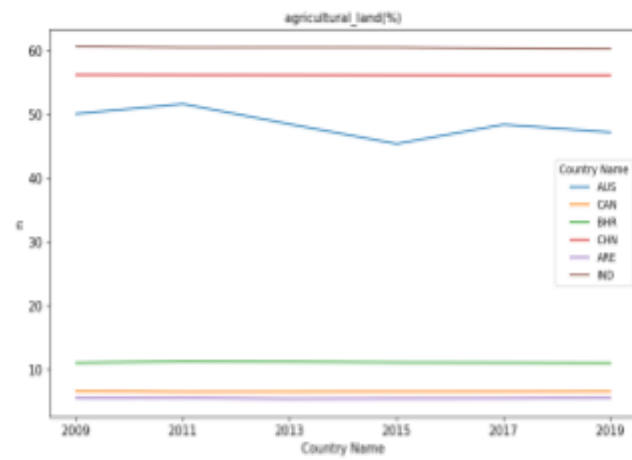
For this investigation, the interrelationships between the following climate change elements were investigated: total CO2 emissions and forest area, agriculture land and arable land. The analysis discovered some relationships between the factors, and the underlying causes were probed.



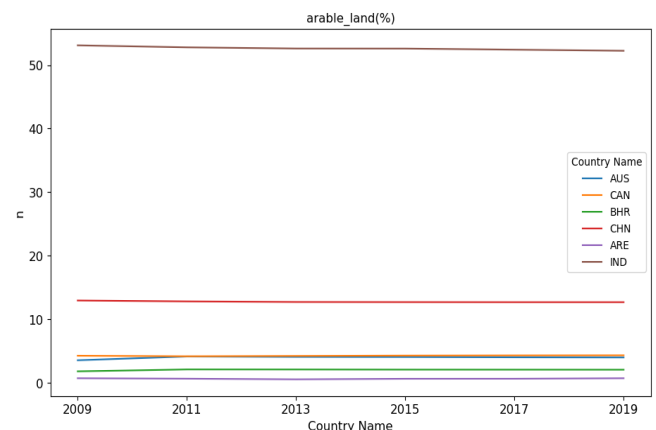
The above bar graph on CO2 emissions by country was created using data available from 2009 to 2019. China is the largest generator of CO2 emissions, which are increasing at a rapid pace. According to the graph, Bahrain is the lowest producer of CO2 emissions. India is the only country growing its CO2 emissions year after year. Every year, Australia and Canada are comparable.



The "CO2 Emission" and "forest area" charts demonstrate that China and India are roughly equal in terms of CO2 emission and forest area, possibly due to their higher populations. Canada and Australia are two countries with low CO2 emissions and large forest areas. Bahrain and the United Arab Emirates have no agricultural lands because they are desert places, and their CO2 emissions are quite low in comparison to other countries..

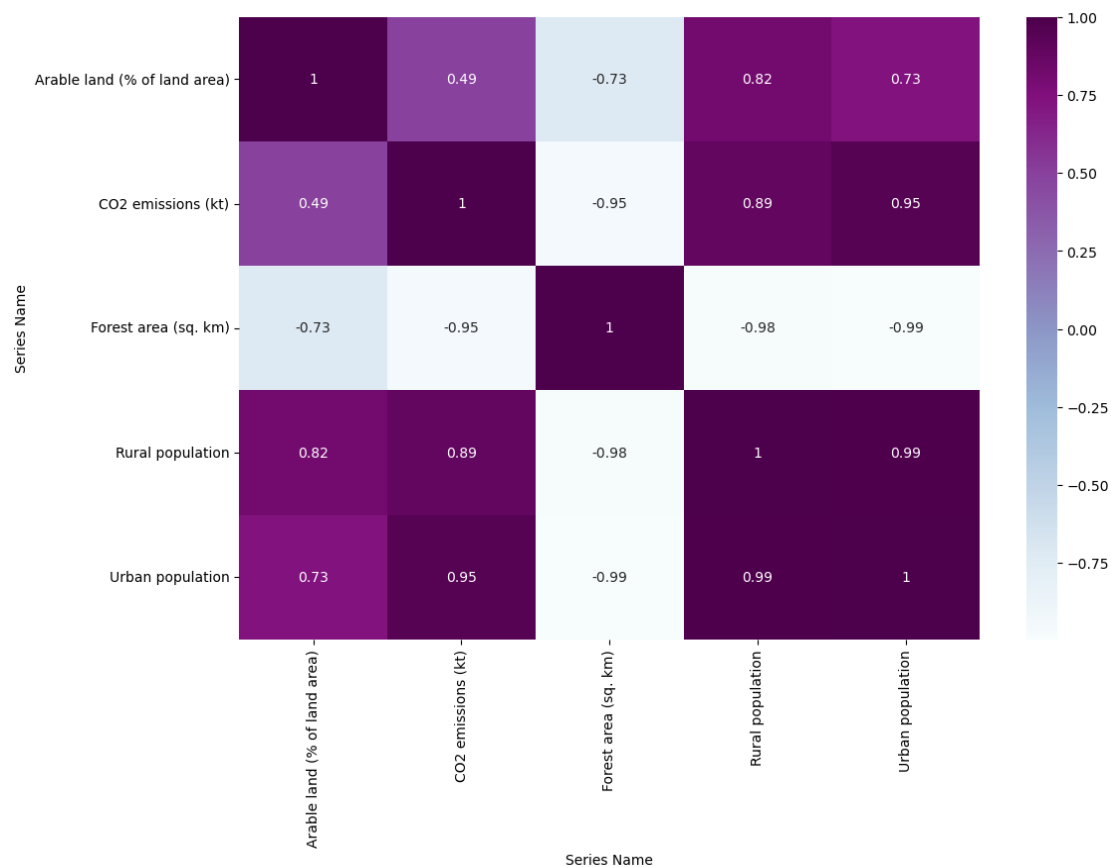


According to the above line plot, India and China have the most agricultural land, with Australia coming in second. Canada has moderate agricultural areas, but Bahrain and the United Arab Emirates have very less.



From the above line plot, because of the moderate climatic circumstances, India has both the amount of agricultural and arable lands in all successive years, as shown by the line plot below. China comes in second to India in terms of arable land.

The remaining selected countries have less arable land than India and China. Arable land and agricultural land have a close association because arable land accounts for a major amount of agricultural land. Crop production is a major component of the agricultural industry in many nations, hence the bulk of agricultural land is arable.



From the above heat map we observe that There is a negative correlation between forest area and arable land, as forests occupy land that could potentially be used for agriculture. There could be a positive correlation between rural population and forest area in Canada are located in or near forested areas. The correlations between forest area, rural population, urban population, and arable land in Canada are complex and multifaceted. These factors are

influenced by a range of social, economic, and environmental factors, and their relationships may vary depending on the specific context and location.