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# ECONOMIC PROSPERITY TO ENVIRONMENTAL CONSEQUENCES

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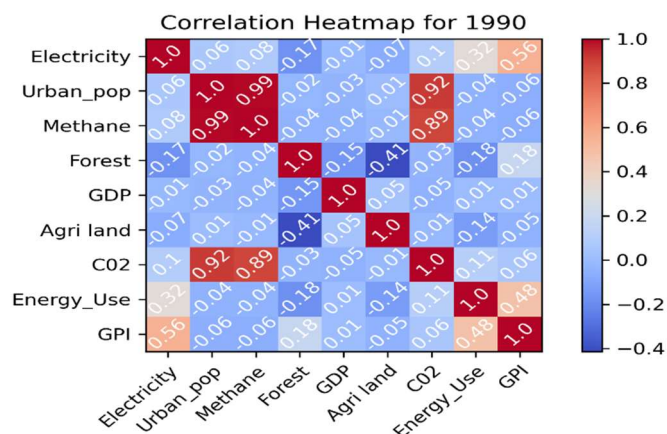
*This report aims at examining and investigating the impact of the top 10 GDP countries on various climate change indicators using World Bank data. The results showed significant variations in carbon & methane emissions, energy usage, and forest area among these countries, highlighting the need for collective action to address the challenges posed by climate change.*

**GitHub repository link: [Assignment-2-Statistics-and-Trends ADS1](#)**

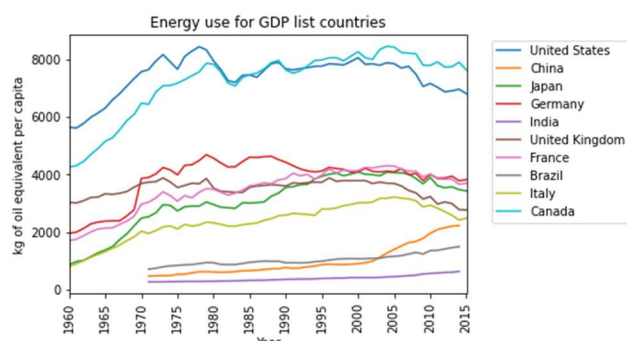
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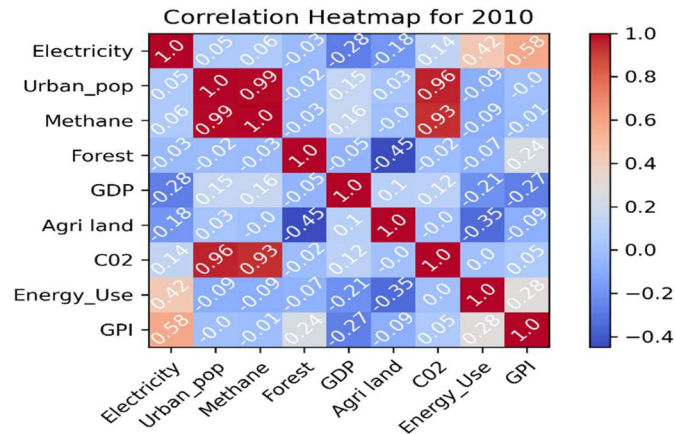
This report involves the study of climate change indicators' impact from the (World Bank Data) and effect on the countries which are in the top ten list of the world GDP ranking. For the countries United States, China, Japan, Germany, India, United Kingdom, France, Brazil, Italy, and Canada and indicators such as Access to Electricity (% of Population), Urban population, Methane emissions (kt of CO2 equivalent), Forest area (% of land area), CO2 emissions (kt), Agricultural land (% of land area), Electric power consumption (kWh per capita), School enrolment, primary and secondary (gross), (GPI), Energy use (kg of oil equivalent per capita) and GDP growth(annual %). The correlation was found to be both positive and negative between some factors and the top countries contributed to the increase in climate change factors as explained below.



From the above correlation heatmap, all countries for the mentioned indicators have been plotted for 1990 and 2010. There is a strong positive correlation between urban population growth and methane emissions. Similarly, CO2 emissions also have an incredibly positive correlation with them. Forest area and agricultural land have a growing negative correlation. The gender parity index has a growing positive correlation with electricity access and oil energy usage. In addition, GDP has a neutral and insignificantly negative correlation with a lot of the indicators.

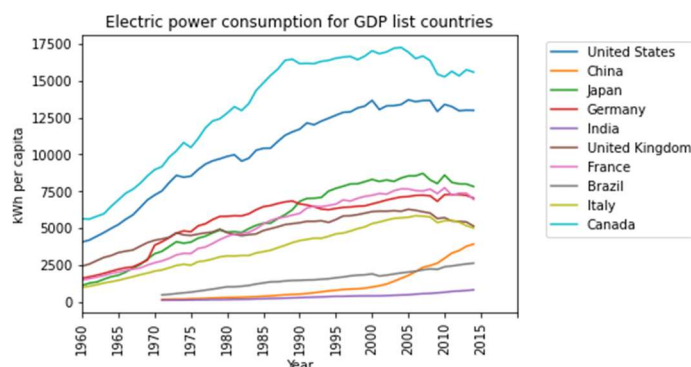


The positive correlation between the gender parity index and oil energy usage may be linked to the role of oil and gas industries in providing job opportunities to women as well, they are more likely to drive cars, which use oil. However, this also suggests that energy usage is not the same for all the top economy countries as the first and tenth countries are using the highest energy and even their population is comparably insignificant with countries like China and India, whose usage of energy is among the lowest and clearly shows that it does not impact GDP.

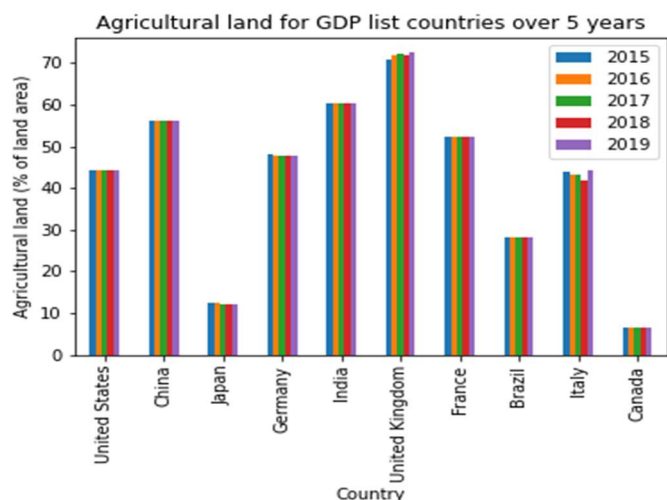


This is a correlation heatmap for the same factors as before for the year 2010 taken for comparison in correlation rate after twenty years. As compared to 1990 all the relations established earlier have grown positively or negatively stronger than two decades ago. The correlation between urban population growth and methane emissions is because, as cities grow, they require more energy, which is mostly produced from fossil fuels that release methane. The correlation between CO2 emissions and urban population growth is due to the same reason.

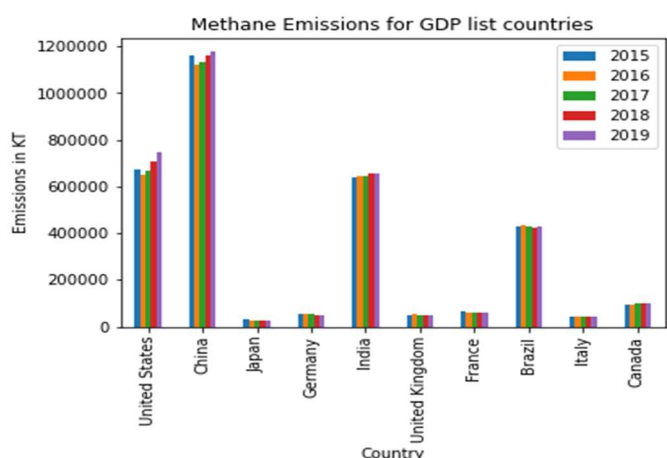
And growing emissions is a matter of concern for all.



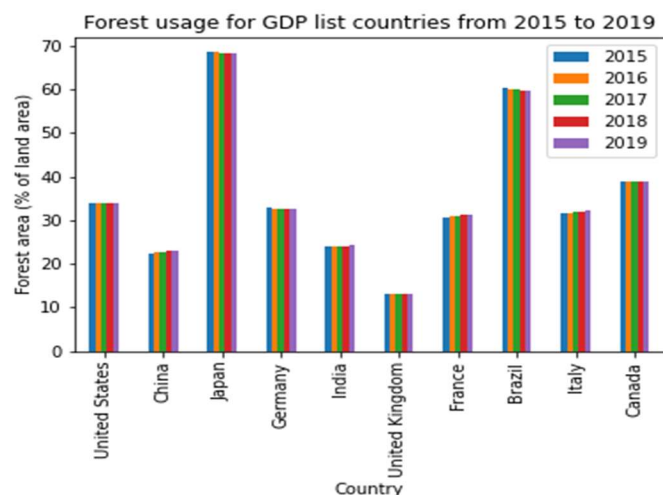
The positive correlation between the gender parity index and electricity access is because, as women have more opportunities to participate in the workforce, they are more likely to have access to electricity, which is necessary for many jobs. However, like energy usage US and Canada are the two only countries whose consumption of electricity is not only the highest but has also increased over the last six decades causing pollution growth over time and leading to an impact on climate change.



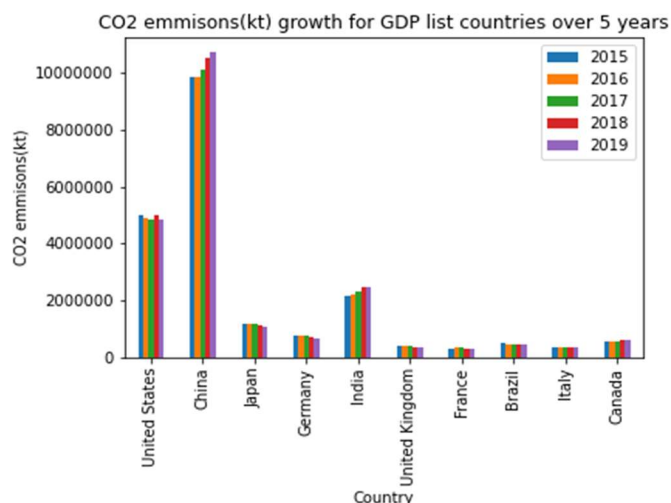
The negative correlation between forest area and agricultural land is likely because, as more land is used for agriculture, less land is available for forests. India, the UK & the US have maintained the agriculture-to-forest land ratio at a balance. Japan is the best and preserving forest land as opposed to Brazil. There are many ways to reduce the negative impact of this correlation. One is to increase the efficiency of agricultural production so that less land is needed to produce the same amount of food. Another is to protect forests from being converted to agricultural land. Finally, we need to find ways to use land more sustainably, so that we can meet our needs without damaging the environment.



The strong correlation between CO2 emissions and methane emissions can be explained by the impact of economic development on greenhouse gas emissions. As development occurs, there is an increase in the consumption of goods and services, which leads to increased emissions of greenhouse gases such as CO2 and methane. Additionally, infrastructure expansion, which often relies on fossil fuels, further contributes to emissions. Furthermore, urbanization is another factor that is associated with economic development, and it can result in increased emissions from transportation and other sources.



Using land more sustainably is another key factor in reducing the negative impact of this correlation. This can involve practices such as crop rotation, intercropping, and agroforestry, which help to maximize the use of available land and minimize the need for additional land for agriculture. In addition to these measures, it is also important to raise awareness about the importance of forests and the impact of deforestation on the environment. Governments, NGOs, and other organizations can work together to promote sustainable land use and conservation practices, and to provide support for farmers and other land users who are working to protect forests and promote sustainable agriculture.



Changes in land use, such as deforestation, which can release greenhouse gases into the atmosphere, are also a consequence of development. However, technological innovation is a potential solution that can help to mitigate the negative impact of development on greenhouse gas emissions. By investing in renewable energy sources and promoting sustainable practices, we can work towards reducing emissions and achieving sustainable development.