

Analysis of Climate Change Indicators for G20 group of countries on The World Bank Dataset (1990 – 2021)

Climate change is expected to hit developing countries the hardest. Its effects—higher temperatures, changes in precipitation patterns, rising sea levels, and more frequent weather-related disasters—pose risks for agriculture, food, and water supplies. At stake are recent gains in the fight against poverty, hunger and disease, and the lives and livelihoods of billions of people in developing countries. Addressing climate change requires unprecedented global cooperation across borders. The World Bank Group is helping support developing countries and contributing to a global solution. The data here covers 76 indicators for over 265 countries and spans for about 20216 entries. People in the **G20 group of countries** have been enforcing climate change policies and have been a good example for other countries to follow. We will be focusing on G20 group of countries and analyze their key indicators. The most interesting findings are discussed below.

As we can see from **Figure 1** that within the G20 Group of countries China has generated the highest amount of CO₂ Emissions, followed by the USA and then India. We can hypothesize that due to ill monitored practices, inspire of environmental policies, USA and China highly contribute to the Emission of CO₂ in the G20 Group of countries.

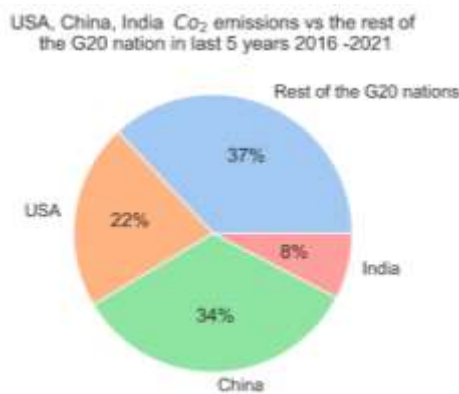


Figure 1: G20 CO₂ emissions in last 5 years 2016

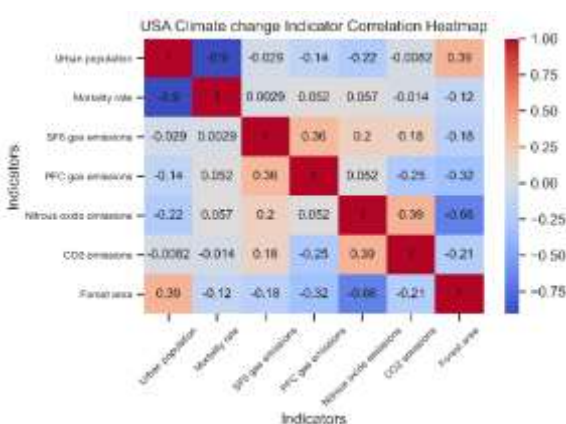


Figure 2: USA Climate change Indicator Correlation Heatmap

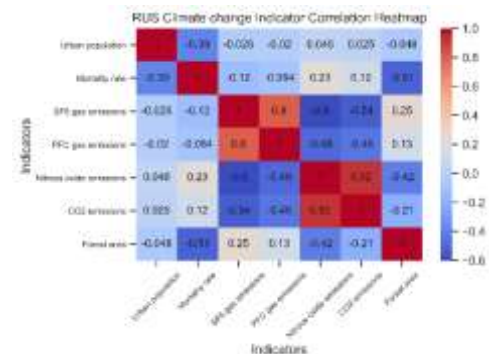


Figure 3: RUSSIA Climate change Indicator Correlation Heatmap

In **Figure 2** for the USA, we can clearly observe that there is a very high negative correlation between urban population and mortality rate. We can deduce that urbanization of the cities has affected health standards in a good way. We also observe that more forest areas yield fewer NO₂ emissions. In **Figure 3**, we can clearly observe that there is a very high positive correlation between NO₂ and CO₂. We can also observe that there is a very weak negative correlation between the urban population and the mortality rate. We can deduce that; urbanization of the cities has not affected the health standards.

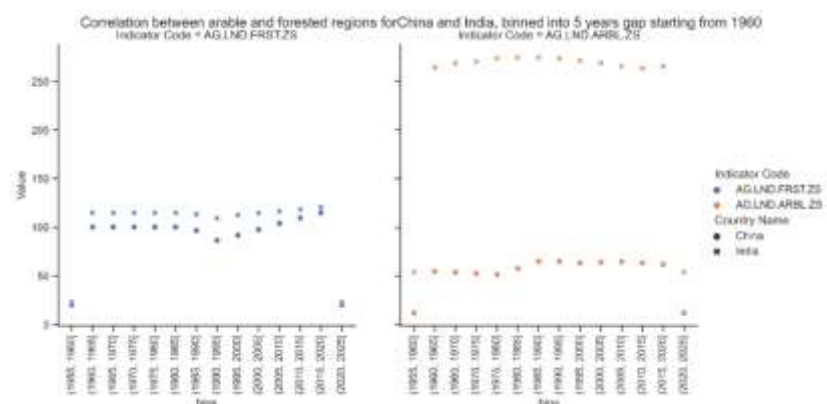
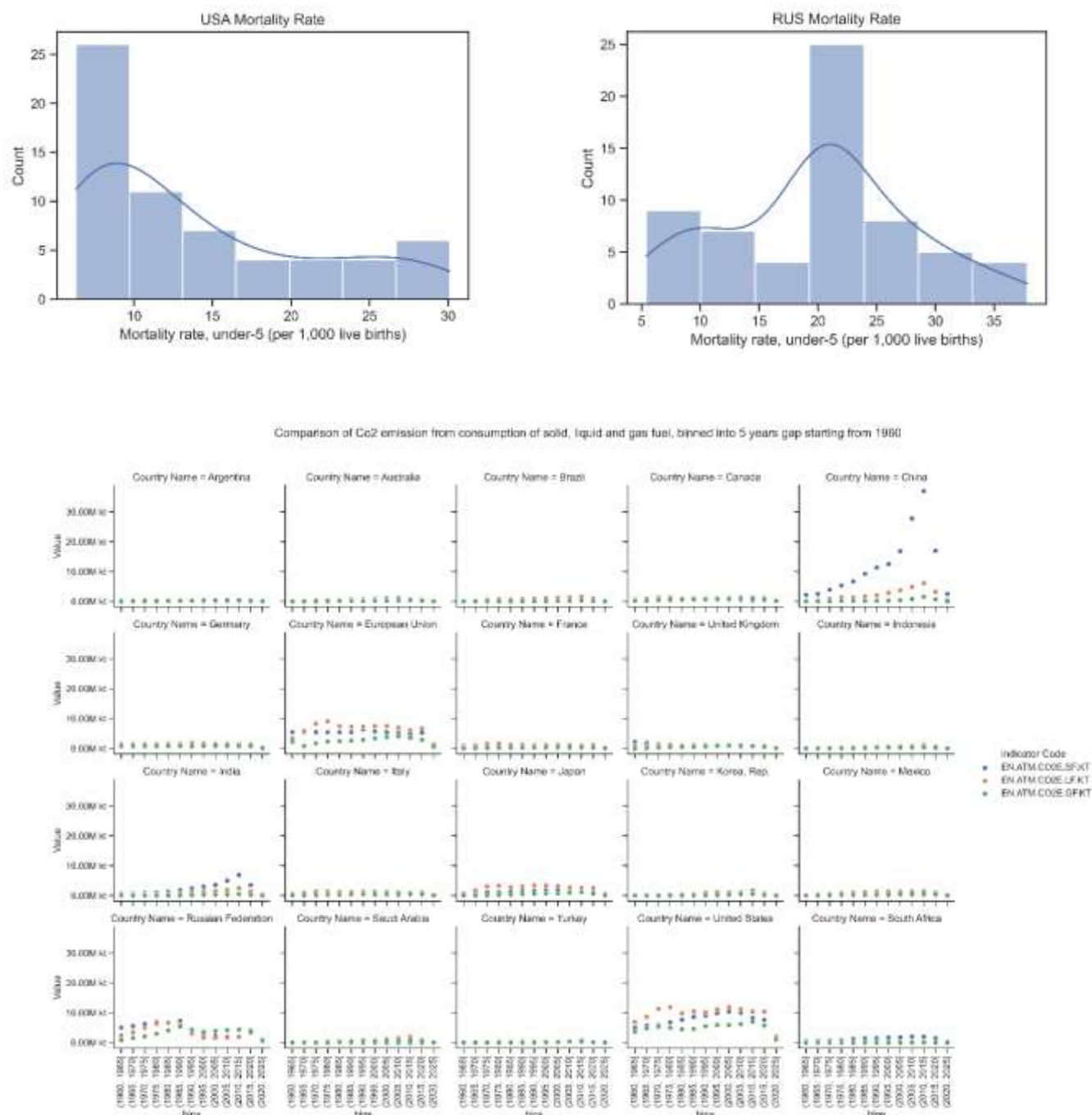


Figure 4: Correlation between arable and forested regions for China and India, binned into 5 years gap starting from 1960

For more granularities we focused on the Arable and Forested indicators for China and India. Apart from technology China also focuses on agriculture same case is with India. We also observed from **Figure 3** that China has a huge number of Carbon emissions, but in our analysis as shown in **Figure 4** we cannot see a correlation between India and China in terms of Arable and Forested areas.



Russia has a higher mortality rate as compared to USA, this can be linked to the living standards and monitored urbanization. Also visualization is helping to explain that CO2 emissions from liquid fuel consumption are significantly greater than those from solid or gaseous fuel consumption. China is an outlier. Additionally, we can see that China generated a whopping **36.2M Kt** of CO2 between 2012 and 2015 through solid fuel consumption. By and large, we can see that the G20 nations have significantly reduced CO2 emissions by 2021, based on the data available. If we conduct a critical analysis of this most of the values for these indicators were missing after 2017. To address this issue for those specific values, the respective indicator mean was used.