A study on economic growth related carbon dioxide damage and forest area damage across the world, for the period of 2012 to 2013.

Research Question:

What is the impact of forest area percentage and carbon dioxide damage on the adjusted net national income per capita across different countries from 2012 to 2013?

In an era where environmental sustainability and economic stability are increasingly intertwined, understanding the impact of natural resource management on national income is crucial. This analysis focuses on the relationship between forest area percentage and carbon dioxide damage, as well as their effects on adjusted net national income per capita across various countries during the years 2012 and 2013. For the study, the "World Bank Database" was utilized.

My motivation for researching this topic stems from the growing discourse surrounding environmental issues in the news and social media. As climate change and deforestation continue to dominate global conversations, it is imperative to understand the economic implications of these environmental challenges. By analyzing the interplay between forest conservation and economic indicators, I hope to contribute valuable insights that can inform policy decisions and promote sustainable practices.

The findings from this research could hold societal benefits, as they can guide the development of effective policies that promote sustainable practices while fostering economic growth. Furthermore, by raising public awareness of the critical link between environmental health and economic prosperity, we can encourage collective action towards conservation efforts.

Sample:

In the used dataset there are 198 observations for each of the studied variables (forest area percentage, CO2 damage, and adjusted net national income per capita) for the years 2012 and 2013. These observations represent the number of countries, involved in the world bank data. 247 countries are available in total, but with missing data for at least one of the variables. To ensure further processing, these values have been cleaned out.

Measures:

The "Forest Area Percentage" represents the percentage of land area that is covered by forests in a given country for the years 2012 and 2013. It is an important indicator of a country's natural resources and environmental health. Forests play a crucial role in carbon sequestration, biodiversity conservation, and providing ecosystem services. A higher percentage of forest area may indicate better environmental management practices and can contribute positively to economic stability by supporting industries such as tourism and timber. This measure ranges from 0% (no forest cover) to nearly 98.4%, highlighting the the large global diversity of the forest coverage across all considered countries.

The Carbon Dioxide Damage quantifies the economic damage associated with carbon dioxide

emissions in a country for the years 2012 and 2013. It reflects the costs incurred due to environmental degradation and health impacts related to CO2 emissions. Understanding CO2 damage is vital for assessing the economic implications of environmental policies and practices. Countries with higher CO2 damage may face greater economic challenges, which can affect their adjusted net national income.

The Adjusted Net National Income per Capita accounts for the depreciation of natural resources and the effects of environmental degradation. It provides a more accurate picture of a country's economic well-being by considering sustainability. This measure is crucial for understanding how environmental factors, such as forest area and CO2 damage, influence economic performance. A higher adjusted net national income per capita suggests better economic health and sustainability practices. This measure ranges from approximately 140 to 78,000, again showing the large spread over the countries.

The measures were not binned any further for the analysis.

Descriptive Statistics:

	FOREST_AREA_PCT_2012	FOREST_AREA_PCT_2013	CO2_DAMAGE_2012	\
count	198.000000	198.000000	198.000000	
mean	31.716363	31.703503	0.483403	
std	22.633250	22.638931	0.370804	
min	0.000000	0.000000	0.048491	
25%	12.410607	12.438350	0.239823	
50%	30.923100	31.110537	0.347316	
75%	45.987527	46.132222	0.632774	
max	98.355128	98.330769	2.509252	

	CO2_DAMAGE_2013	ADJ_NAT_GPA_2012	ADJ_NAT_GPA_2013
count	198.000000	198.000000	198.000000
mean	0.490841	10389.064354	10750.837168
std	0.378653	14401.762755	14837.418061
min	0.051330	140.283161	154.823047
25%	0.246539	1246.589853	1351.589495
50%	0.358736	4189.441131	4424.458368
75%	0.645756	11192.652427	11851.325623
max	2.485223	78441.338470	80588.454610

Forest Area Percentage (2012 and 2013): The mean forest area percentage is around 31.7%, with a standard deviation of approximately 22.6%. This indicates a wide variation in forest area across countries.

CO2 Damage (2012 and 2013): The mean CO2 damage is around 0.48 to 0.49, with a standard deviation of approximately 0.37. This suggests that there are countries with significantly higher CO2 damage.

Adjusted Net National Income per Capita (2012 and 2013): The mean adjusted net national

income per capita is around 10,389 to 10,751, with a large standard deviation, indicating significant income disparity among countries.

Analyses:

In the following, the approach in context of the research topic is described. To understand the strength and direction of the relationships between the variables, a correlation matrix is created. In the next step, an ANOVA is performed, to check for statistical significance among the means of different groups. For this, further binning of the data might be meaningful. In the last step, a linear regression to forecast the 2013 data based on the 2012 data is being performed, to model the relationship between the independent variables (forest area percentage and CO2 damage) and the dependent variable (adjusted net national income per capita).