Climate Change Data Analysis

To comprehend climate change, we must address a fundamental question: What is it?
Based on Nasa Definition:
"Climate change is a long-term change in the average weather patterns that have come to define Earth's local, regional and global climates. Changes observed in Earth's climate since the early 20th century are primarily driven by human activities, particularly fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth's atmosphere, raising Earth's average surface temperature. These human-produced temperature increases are commonly referred to as global warming.[5]"

The goal of this analysis was to explore climate change, its various causes, and the resulting effects. In the initial phase, I examined the average temperature changes in different countries. It became evident that until 1976, temperature changes had negative values, indicating a cooling trend. However, post-1977, the trend shifted to consistently positive values, indicating a warming pattern at a rate of approximately 0.15 to 0.20 degrees Celsius per decade. Subsequently, I delved into the analysis of sea level changes, a key indicator of temperature increase, revealing a noticeable rise in sea levels over recent decades.

But what is behind this Earth's temperature?
Simply put, greenhouse gases like carbon dioxide, methane, and nitrous oxide. Since the mid-19th Century, scientists have known that greenhouse gases have substantial control over Earth's climate, despite their small amounts in the atmosphere. They trap the Sun's energy in the Earth's system before it escapes to space, leading to warming. This is known as the greenhouse effect, a process that is essential for keeping the planet at a suitable temperature for life.

After analyzing data related to CO2 emissions worldwide, I pondered whether the increase is a universal trend. What about the impact of climate policies that are being implemented globally? To explore this, I compared a sample of five developed countries with five developing ones. The findings revealed that, despite producing less CO2, the selected developing countries exhibit an increasing trend, while the developed countries show a decreasing trend. This discrepancy can be attributed to the implementation of environmentally friendly policies adopted by the developed nations.

Towards the conclusion of the analysis, I endeavored to discern any discernible trends in global disasters. It became evident that there is a conspicuous and escalating pattern in the frequency and severity of such incidents worldwide.

In conclusion, the analysis unraveled a distinct warming pattern since the late 20th century, attributed to human activities and greenhouse gas emissions. Furthermore, a comparative examination of CO2 emissions showcased a noteworthy disparity between developing and developed nations, highlighting the impact of environmental policies. Finally, the investigation revealed an unmistakable upward trajectory in global disasters, emphasizing the urgency for collective efforts to address the impacts of climate change.