

Climate Change

Causes, Effects, Impacts & Solutions

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What is Climate Change?

Climate change refers to significant and long-term shifts in global weather patterns, primarily caused by human activities such as burning fossil fuels, deforestation, and industrial processes. These activities release greenhouse gases into the atmosphere, trapping heat and leading to a rise in global temperatures.

The effects of climate change are wide-ranging and include rising sea levels, more frequent and severe weather events such as Droughts, Extreme Temperature, Landslides, Flood, Storm, Wildfire, shifts in ecosystems and habitats, and disruptions to agriculture and food security.

Addressing climate change requires a multifaceted approach that includes reducing greenhouse gas emissions through renewable energy adoption, improving energy efficiency, protecting and restoring ecosystems, and implementing policies and agreements at local, national, and international levels.



CID Admin
Private Organization 

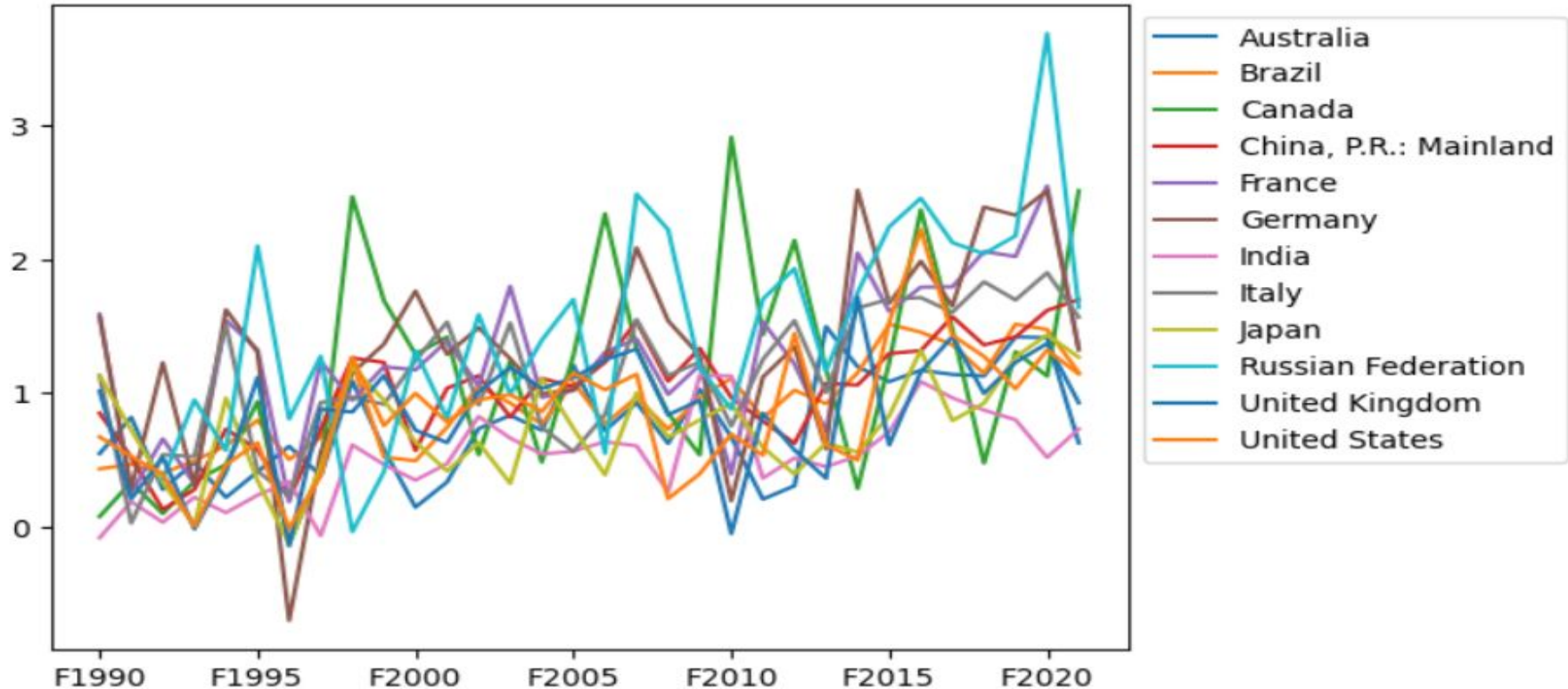
Average Climate Change

How has the average global temperature trend changed over the past decade, and what are the primary drivers of this change?

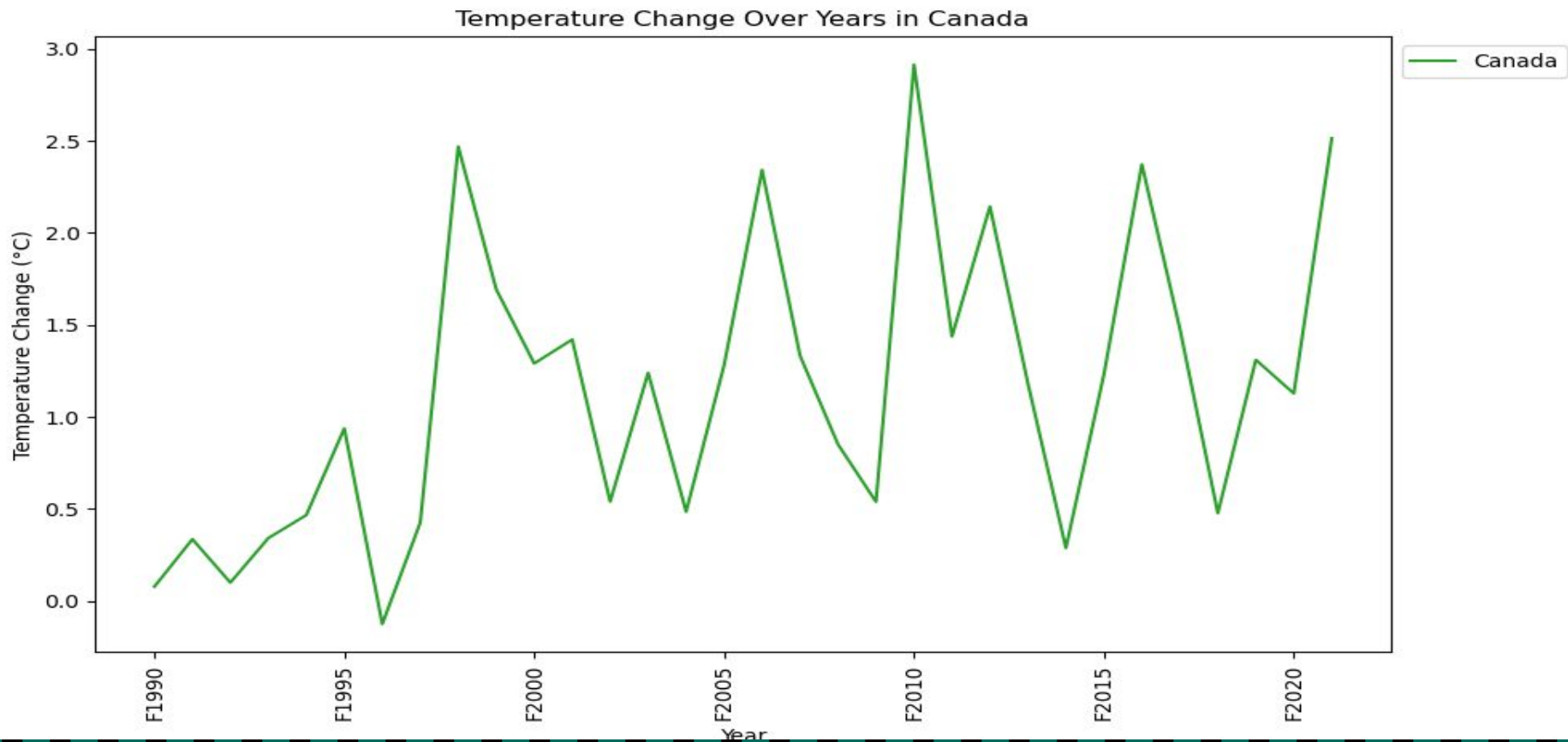
Global temperatures have constantly increased over the past decades. The temperature changes very significantly, indicating diverse impacts of climate change globally.

Temperature Shifts Throughout the Meteorological Year

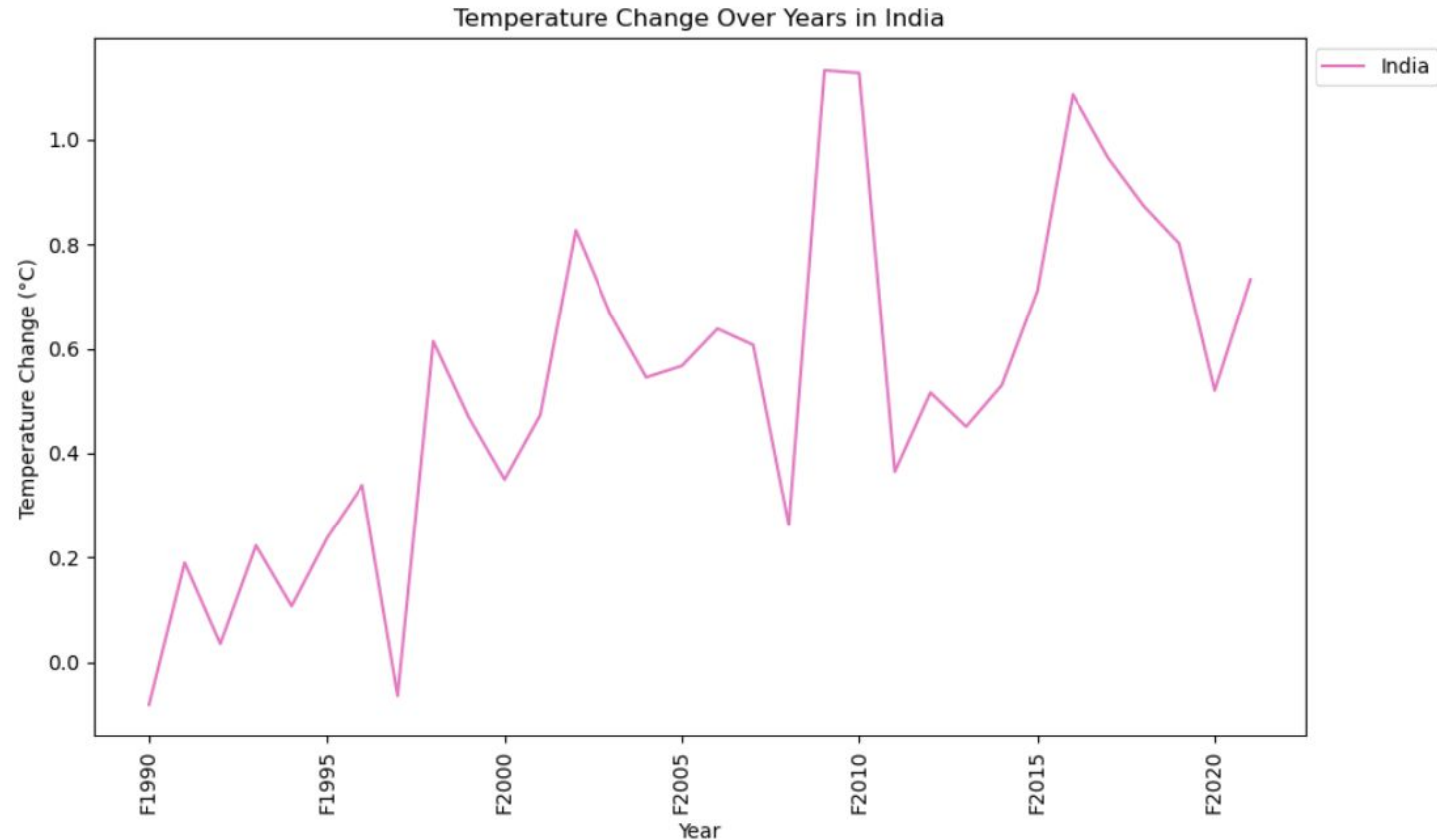
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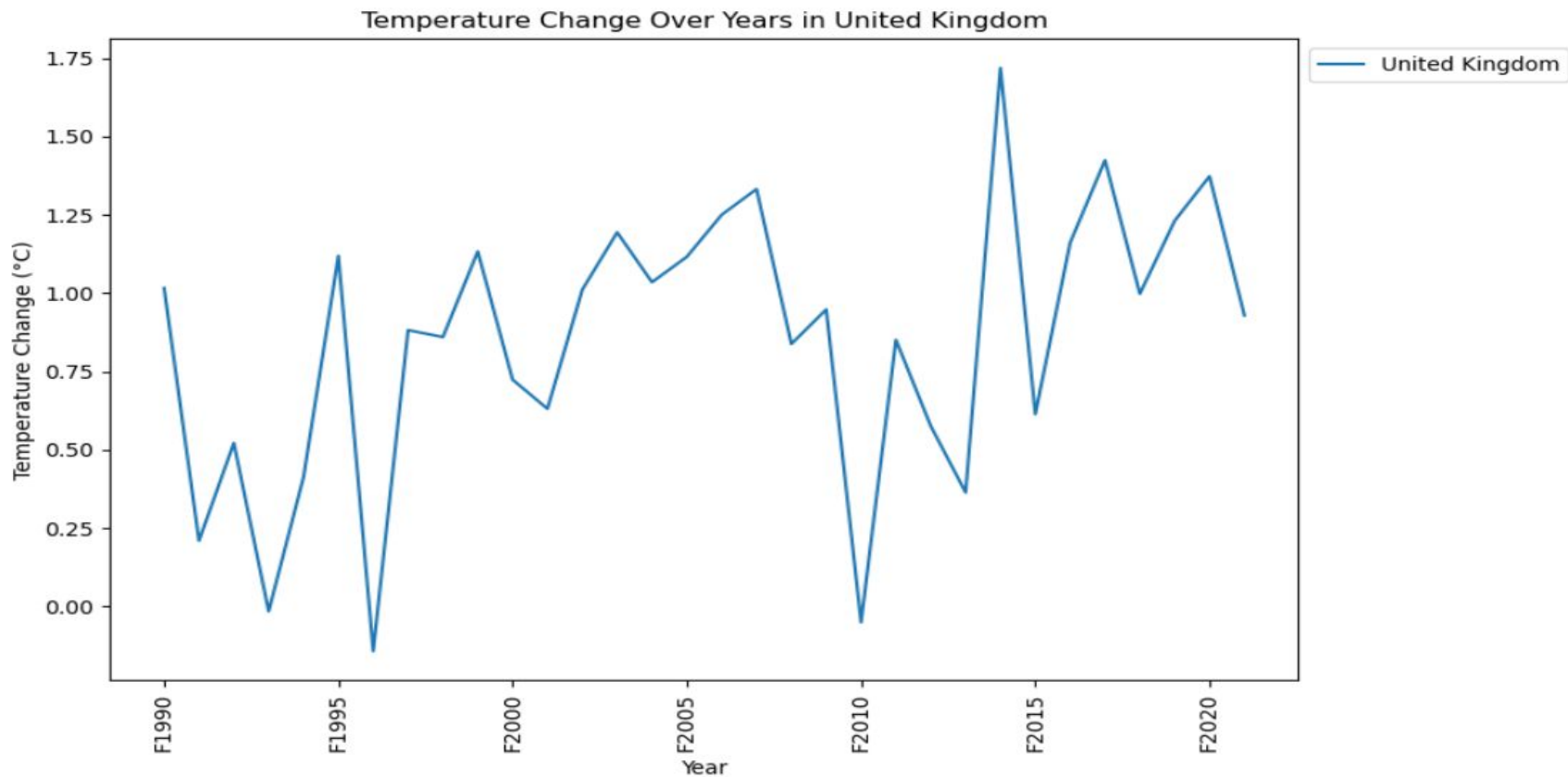
Canada's Meteorological Year Temperature Trends



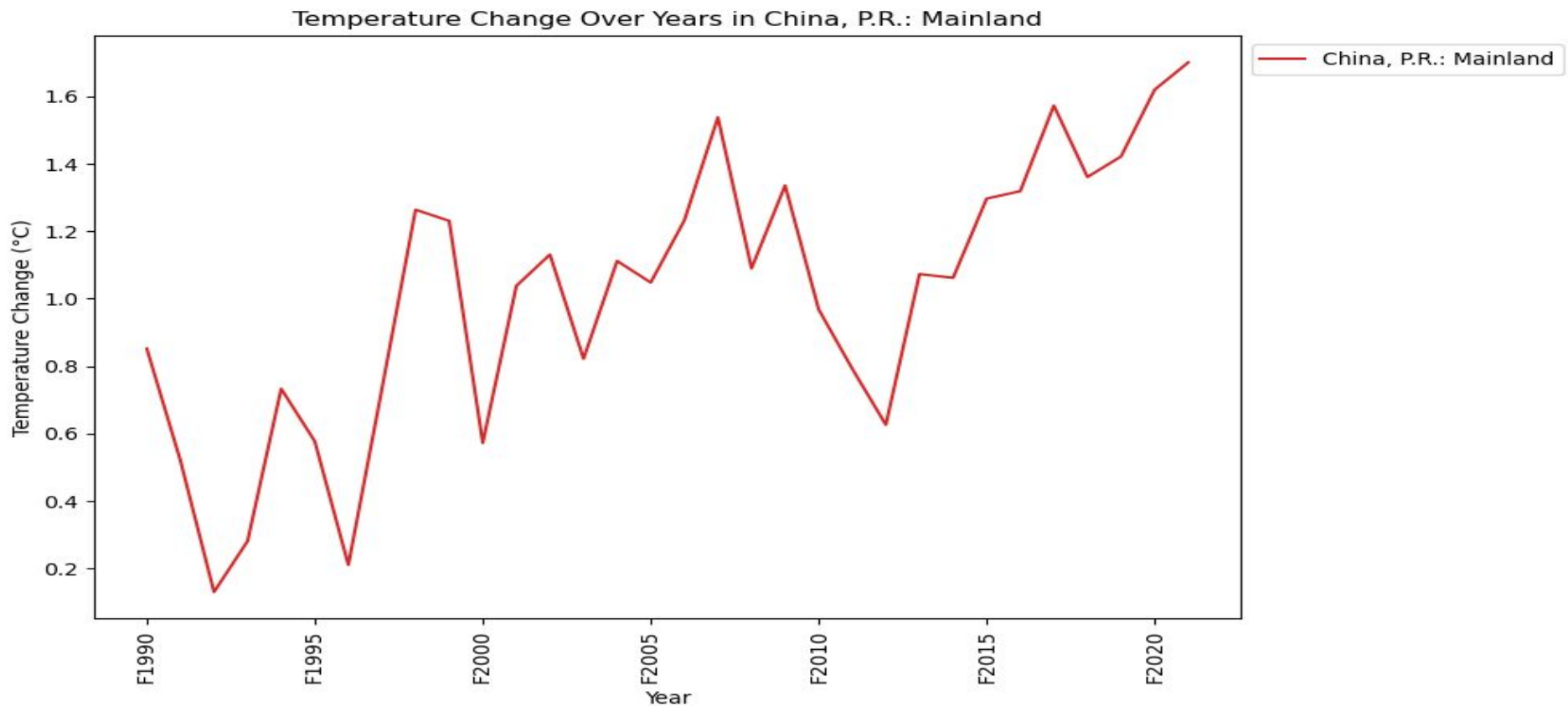
India's Meteorological Year Temperature Trends



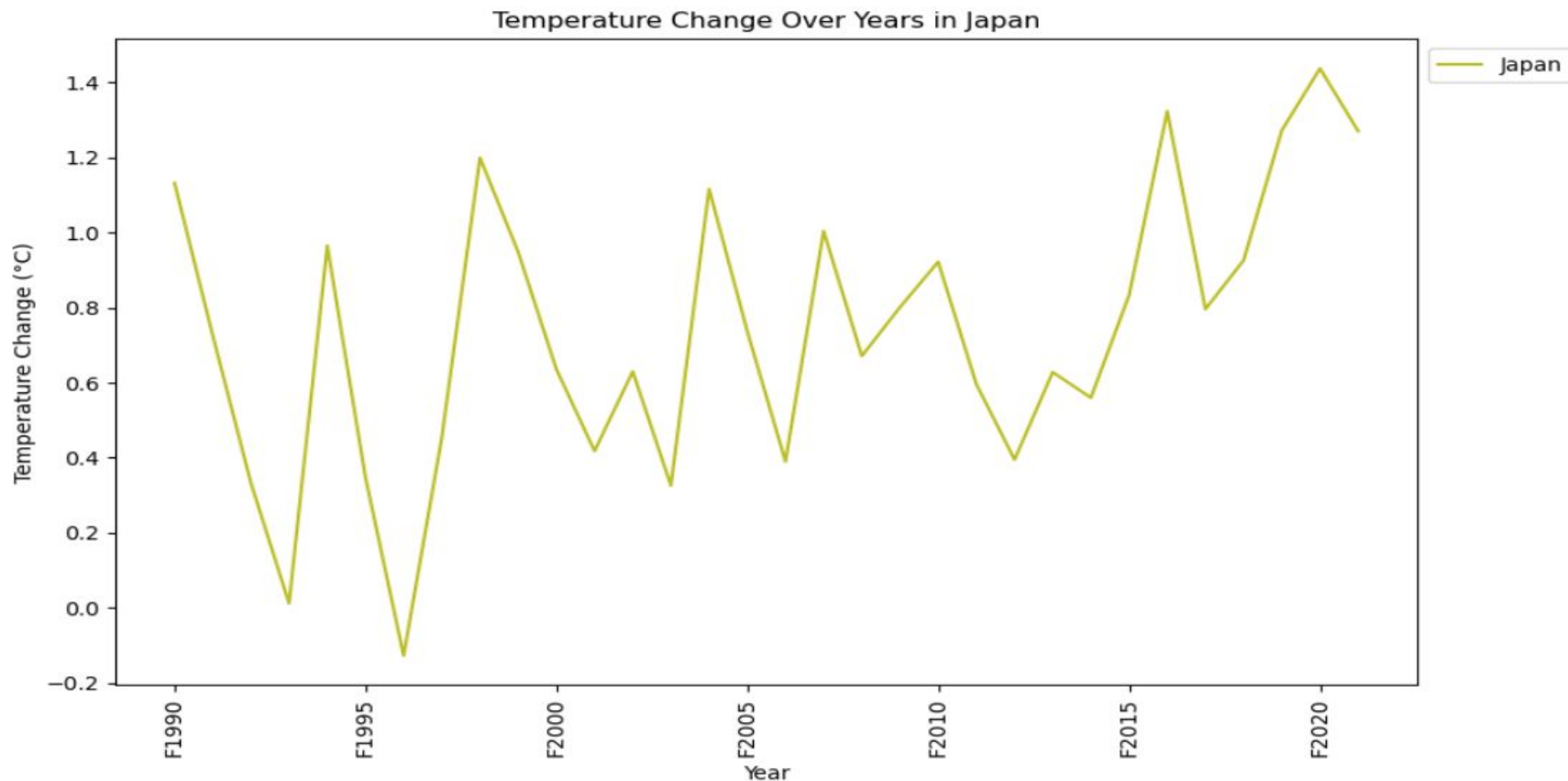
UK's Meteorological Year Temperature Trends



China's Meteorological Year Temperature Trends



Japan's Meteorological Year Temperature Trends



Summary

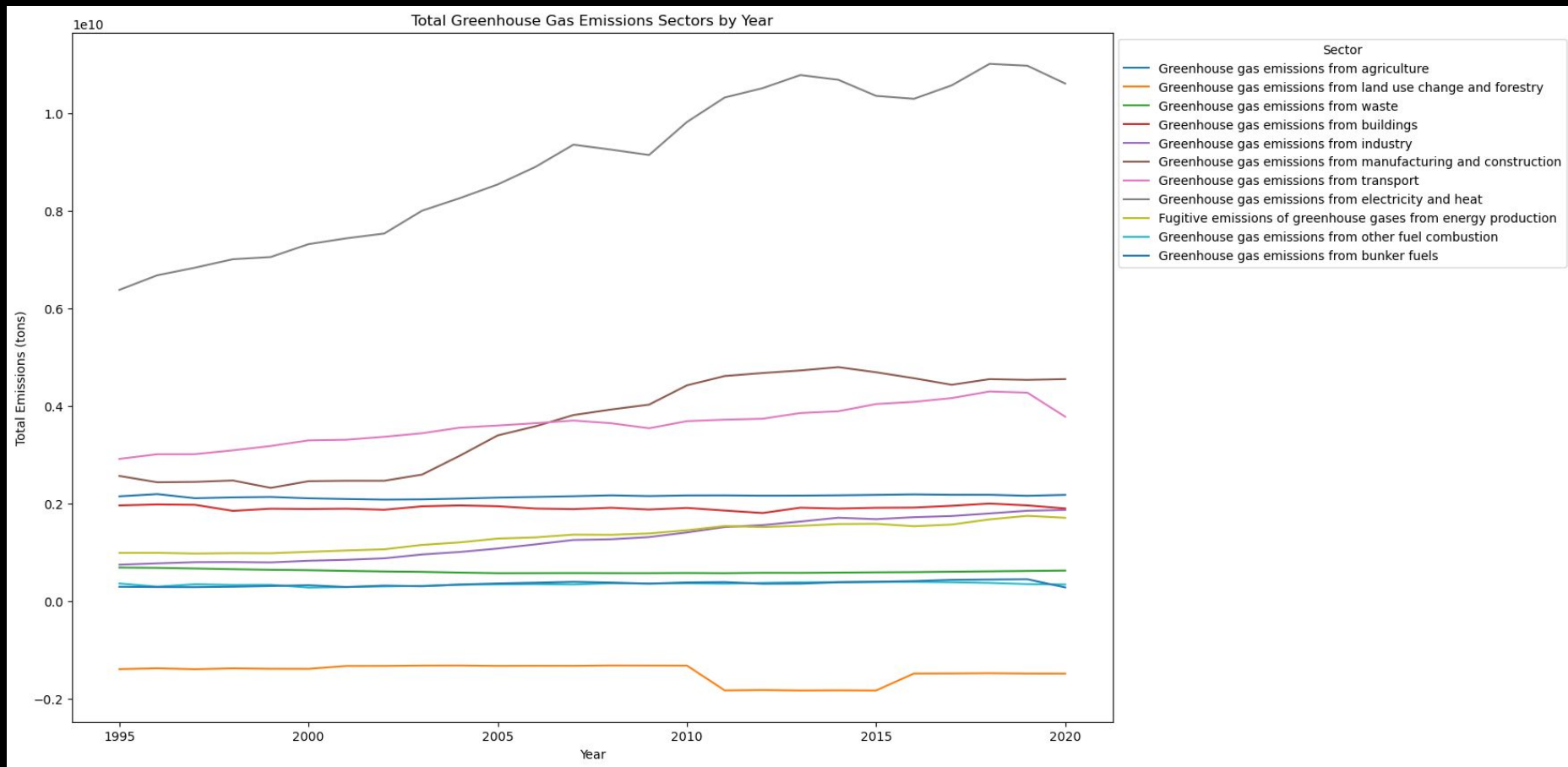
- The average temperature change across all countries is approximately 1.362.
- Canada has experienced the highest average temperature change of 2.515, followed by Russia with 1.634.
- India has the lowest average temperature change of 0.733.
- Visualizing the data through a horizontal bar chart allows for easy comparison of temperature changes among different countries, showcasing Canada and Russia with highest change.

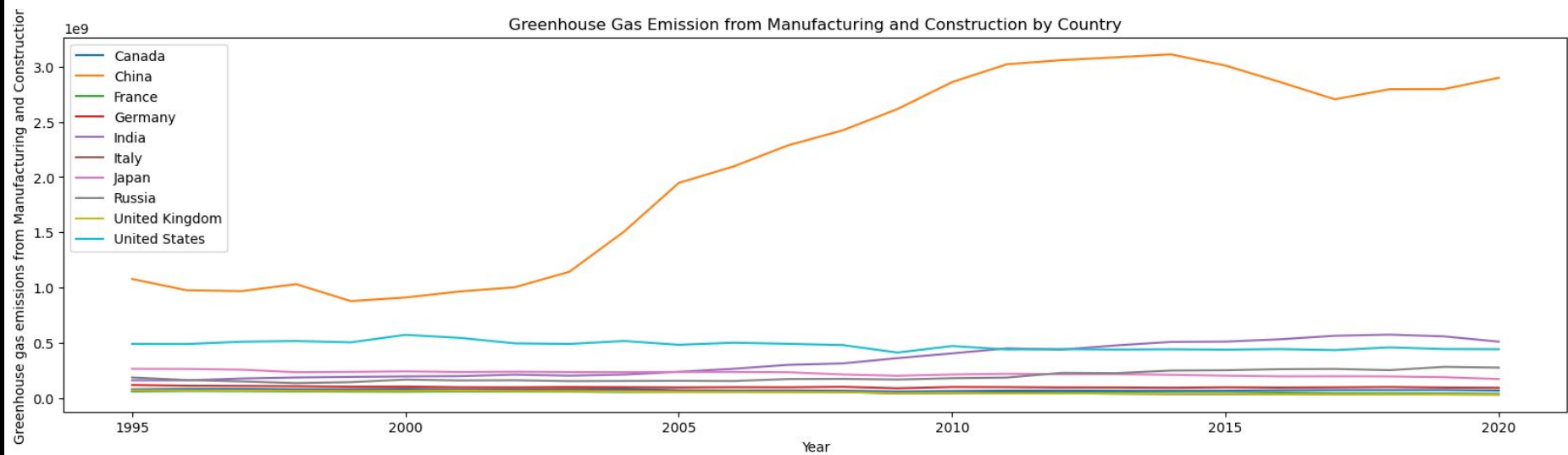
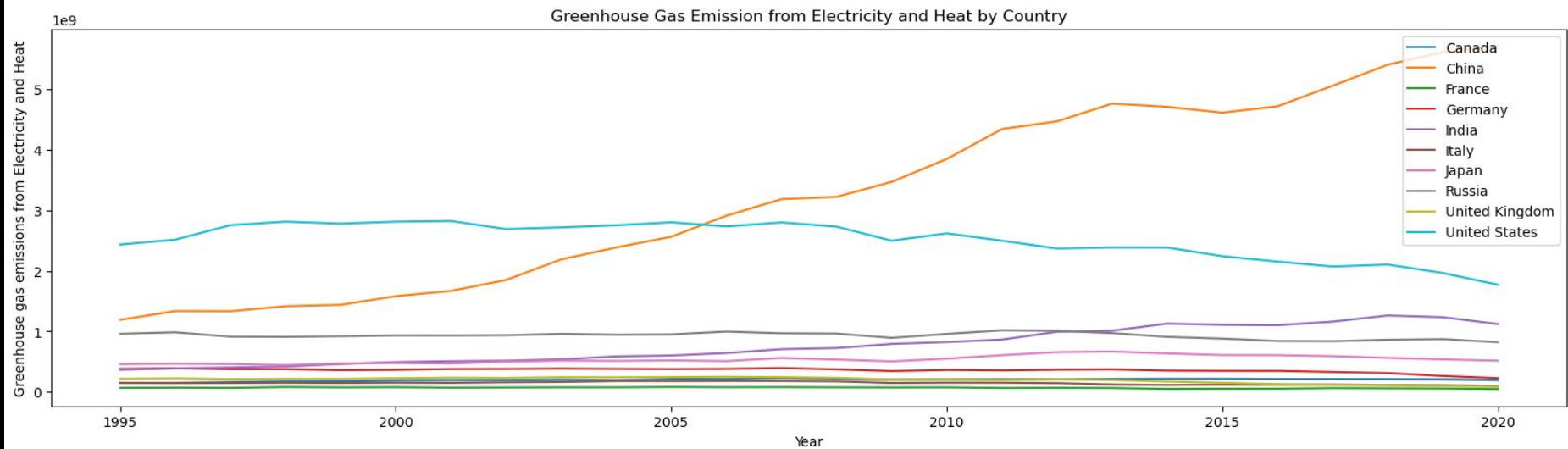


CO2 Emission Effects

What working sector is the worst for global warming based on CO2 emissions?

- CO2 (carbon dioxide) is a gas naturally present in the atmosphere, also emitted from human activities like burning fossil fuels.

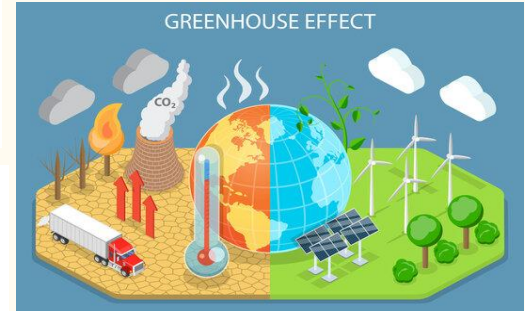
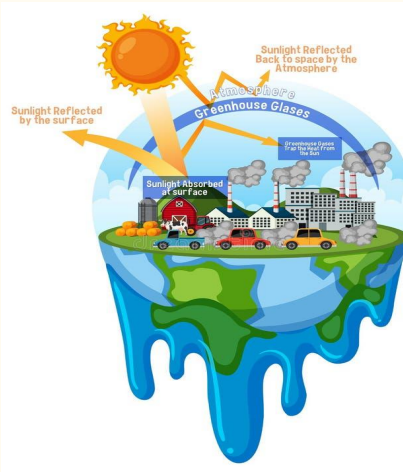
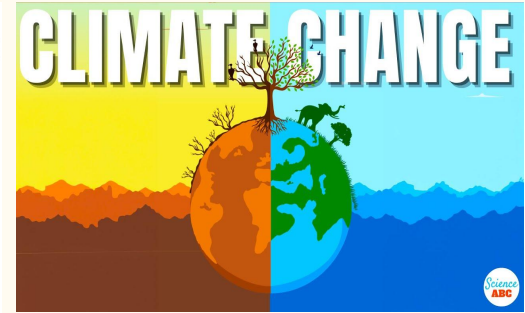




Summary

Since 1995 till now, the sectors contributing the most amount of CO₂ are:

- Electricity and heat
- Transport
- Manufacturing and construction
- Agriculture



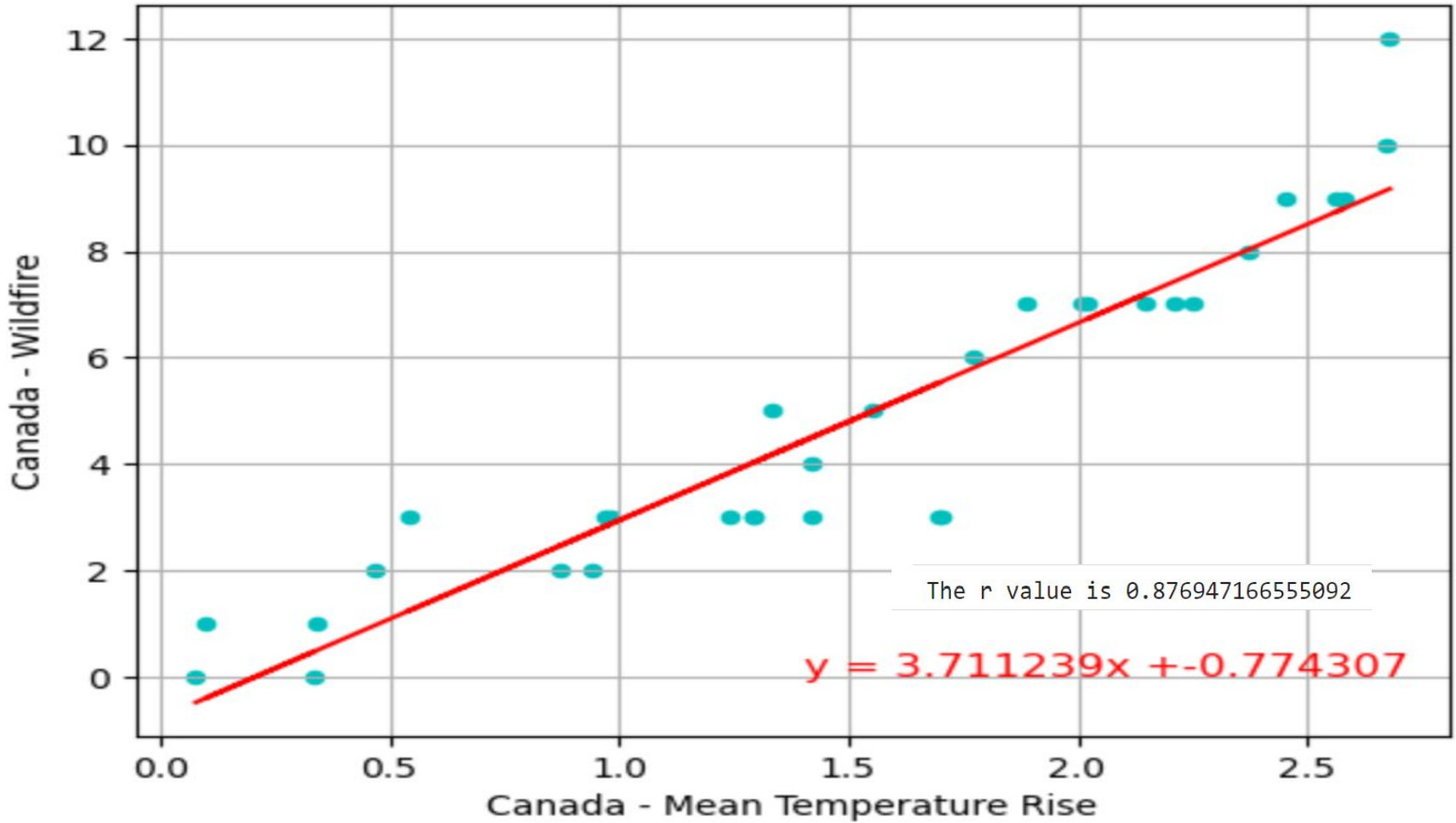
Global Impacts

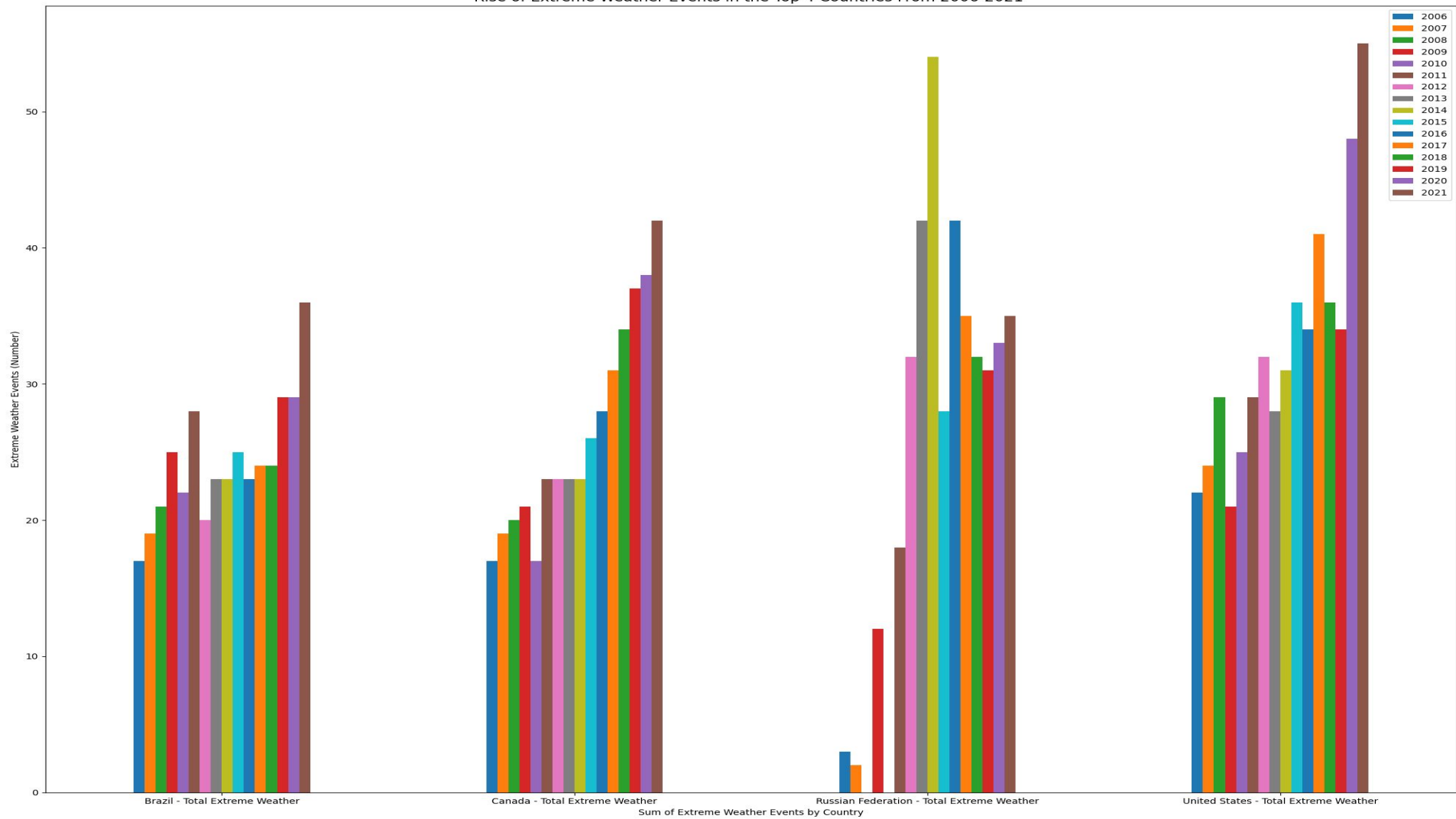
What are the impacts of global warming on weather patterns?

- Increase of Extreme Weather Events such as Drought, Flood, Extreme Temperature, Landslide, Storm and Wildfire.



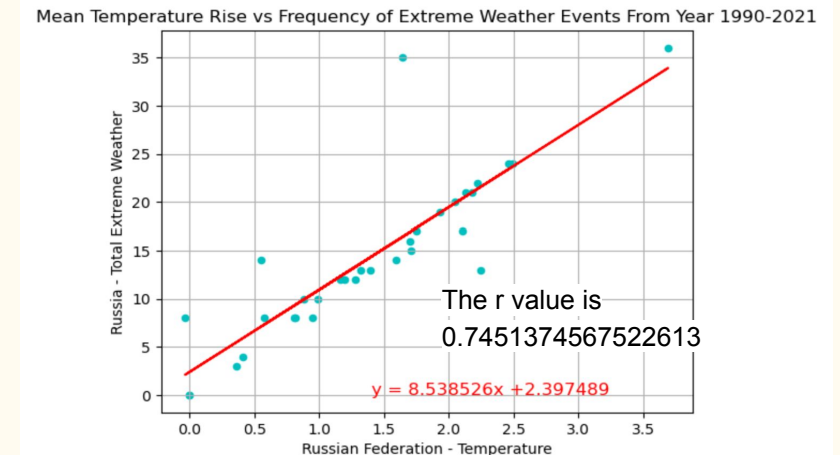
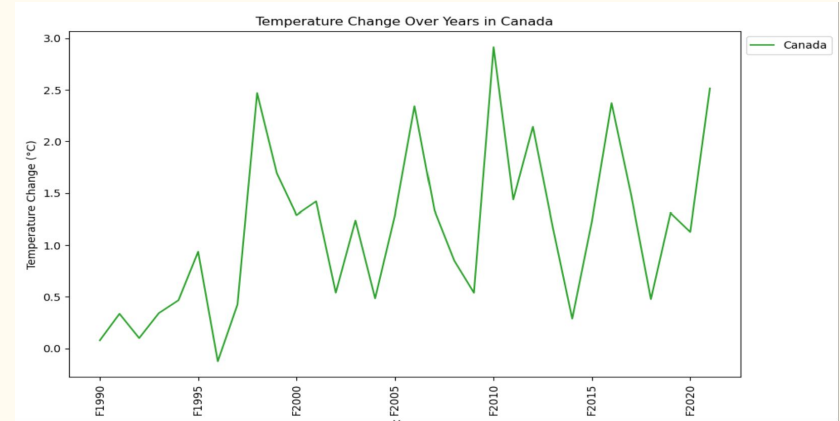
Mean Temperature Rise vs Frequency of Wildfires From Year 1990-2021





Summary

1. Top two countries where extreme weather events have increased worldwide from 1990-2021 are Canada & Russia. These are the two countries which have also experienced the highest average Temperature Change of 2.515 and 1.634 Respectively from 1990 - 2021.
2. From the scatter plots we can visualize that the correlation hypothesis test (linear regression) returns a correlation coefficient of 0.74 which indicates a strong positive relation between Mean temperature rise in Russia vs the Rise of extreme weather events .

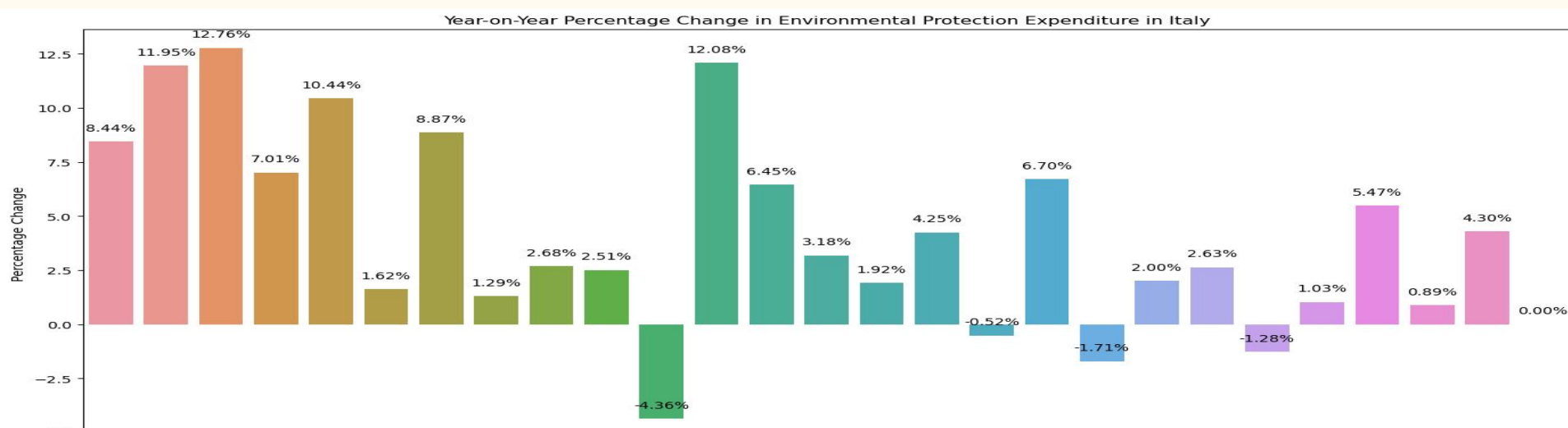
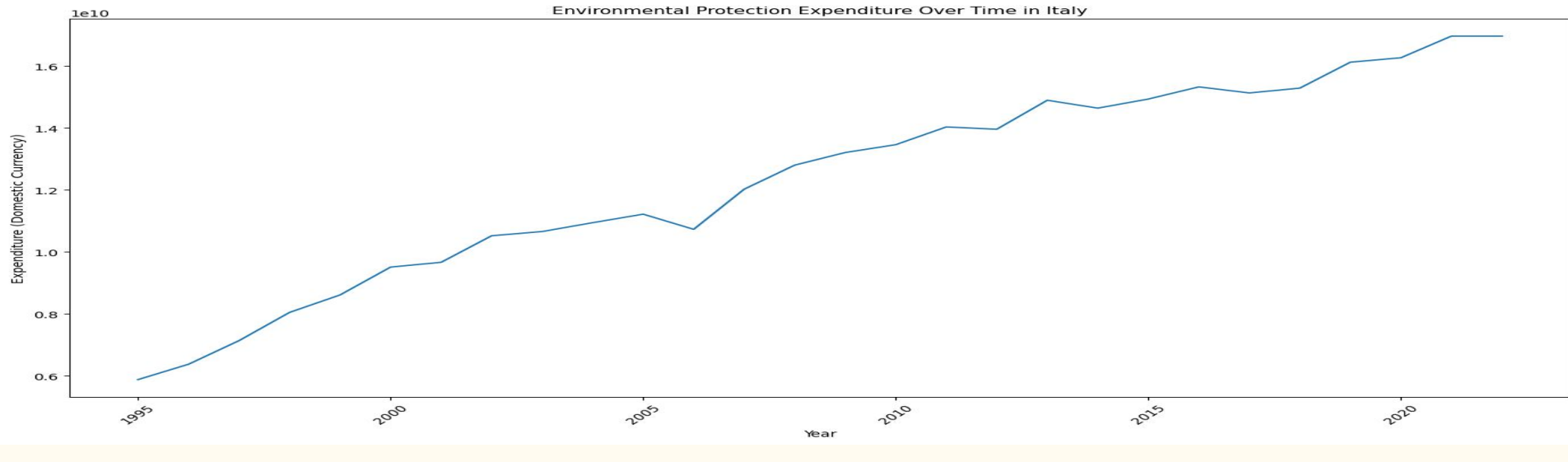


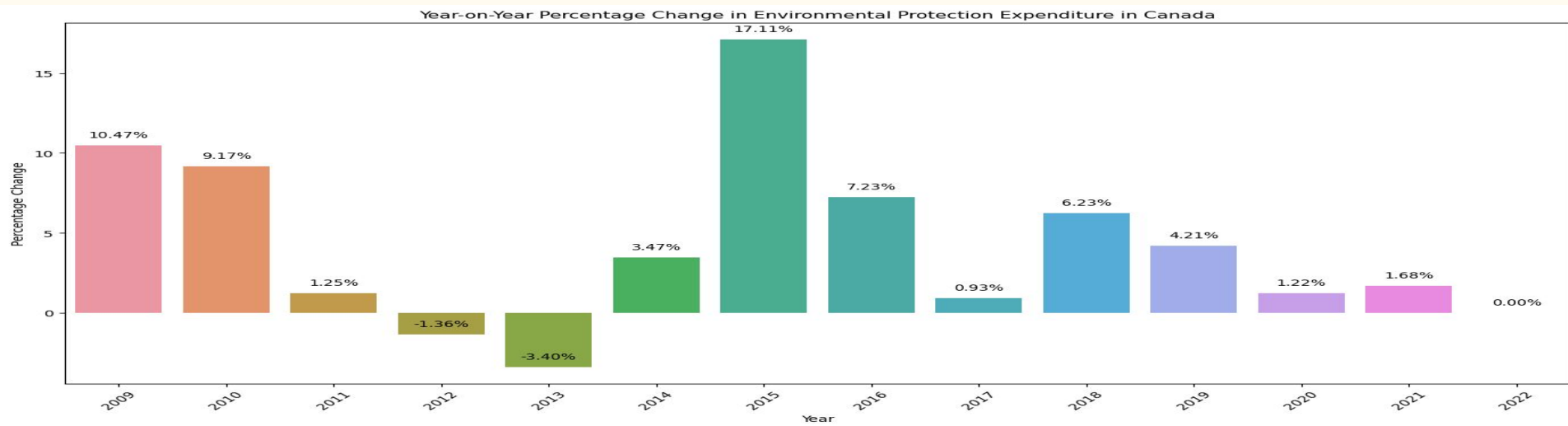
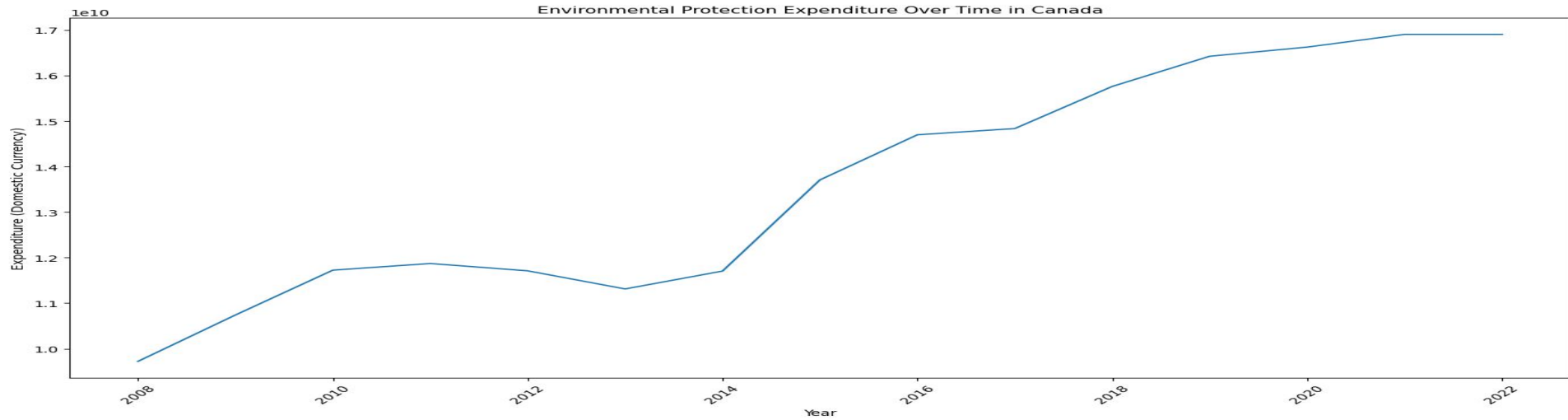
Government Spending on Environmental Protection

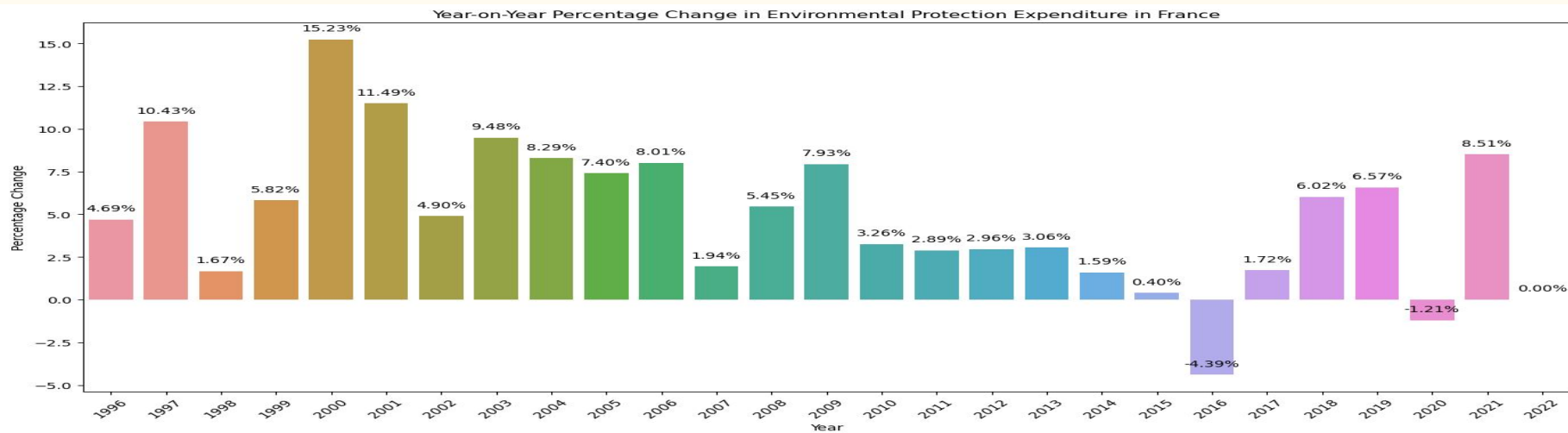
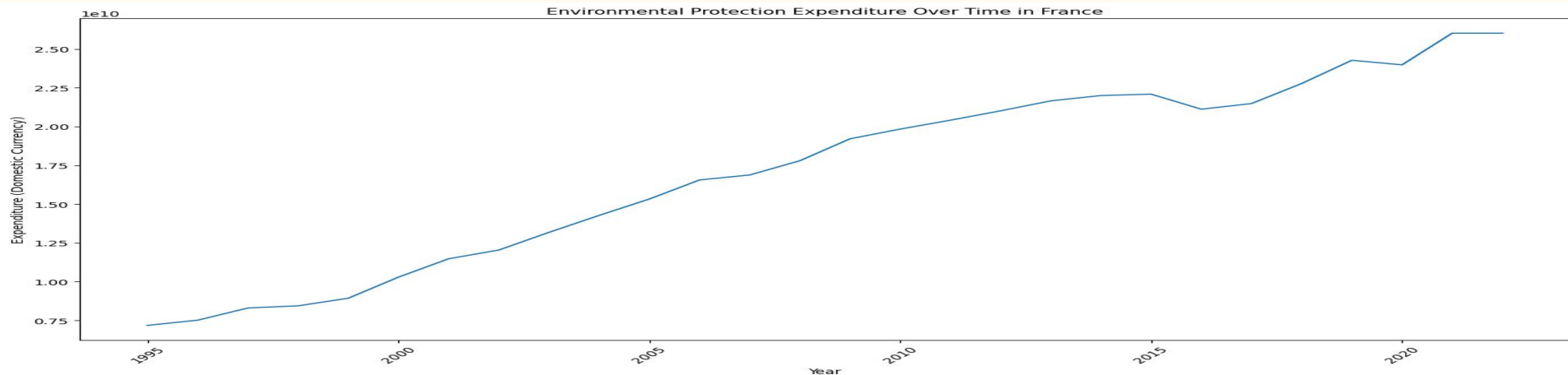
How much does government
from all over the world spend to
protect environment from
climate change?



Canada, China, France, Germany,
Italy, Japan, Russia, and Mainland
China



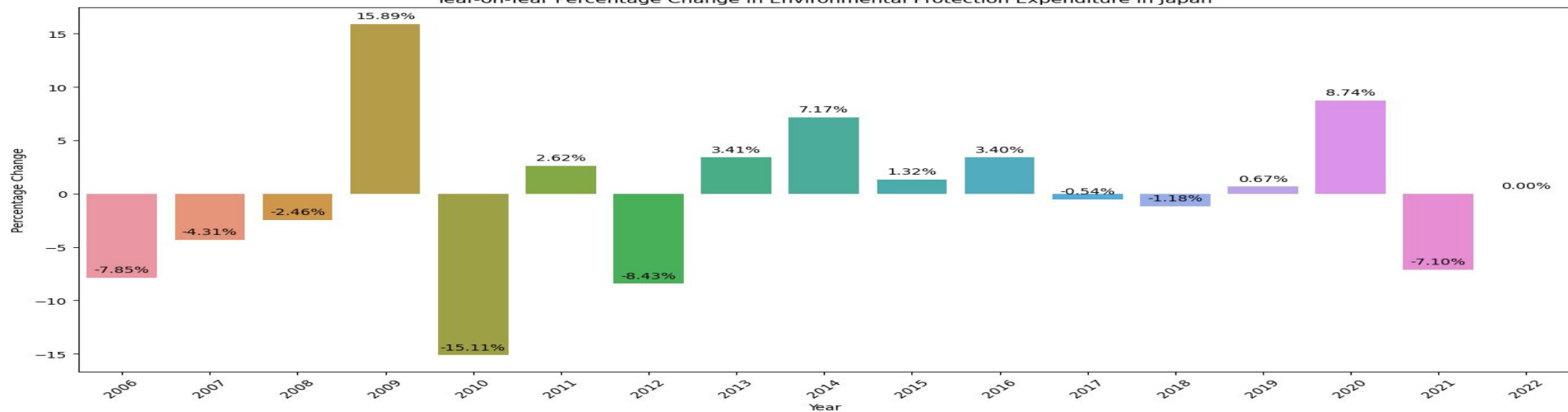


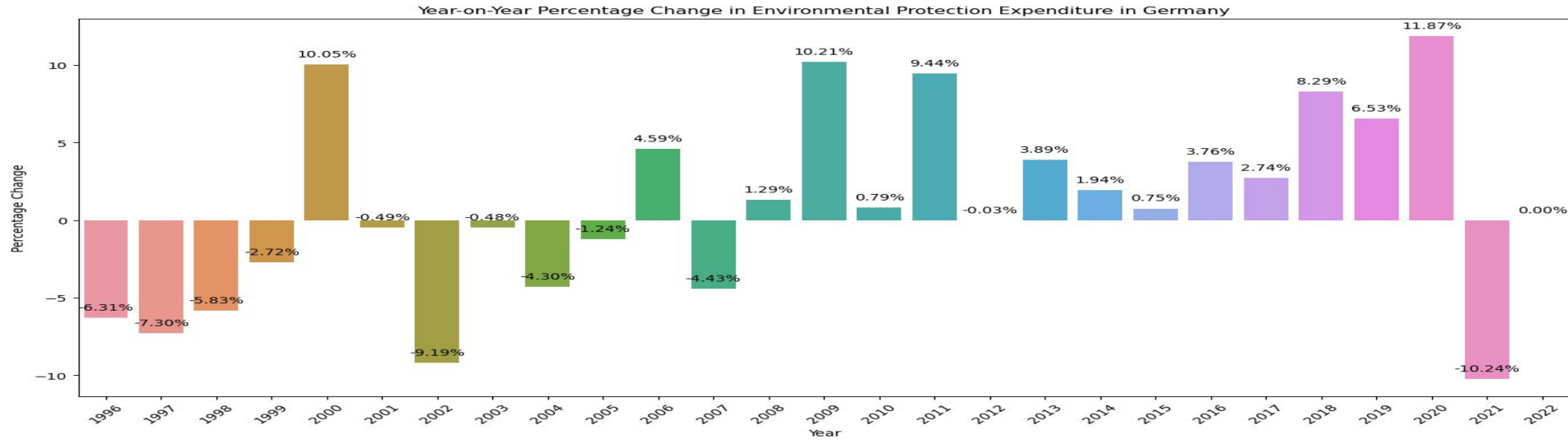
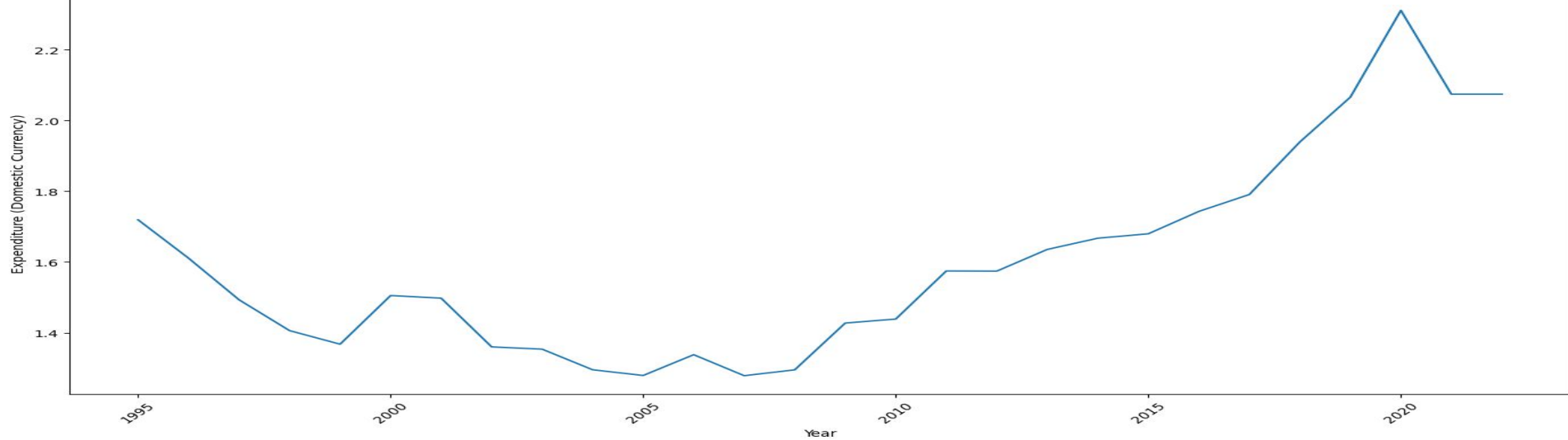


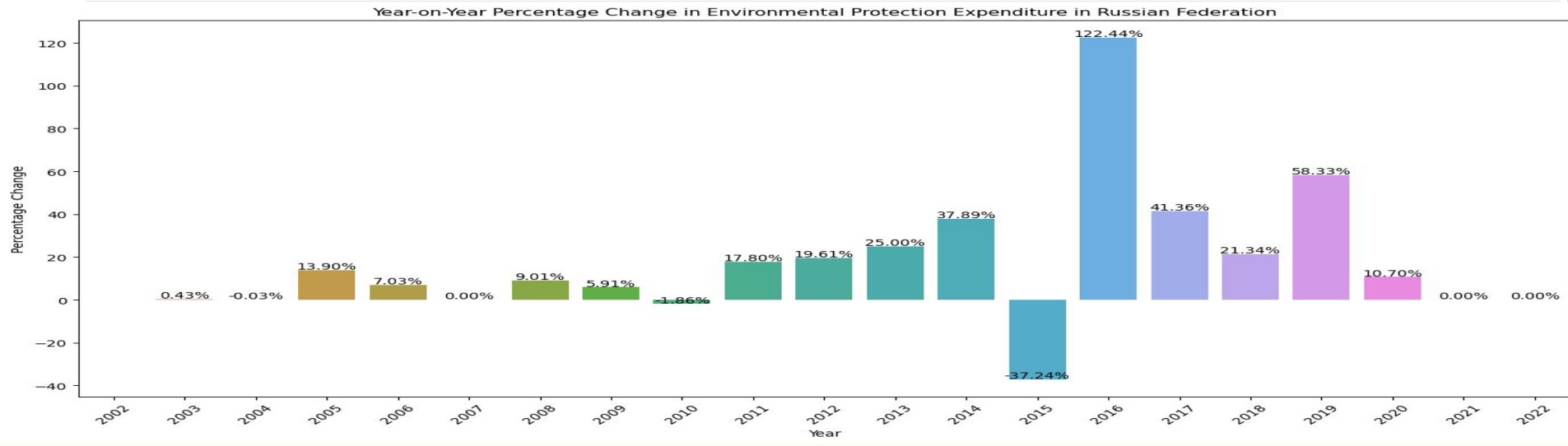
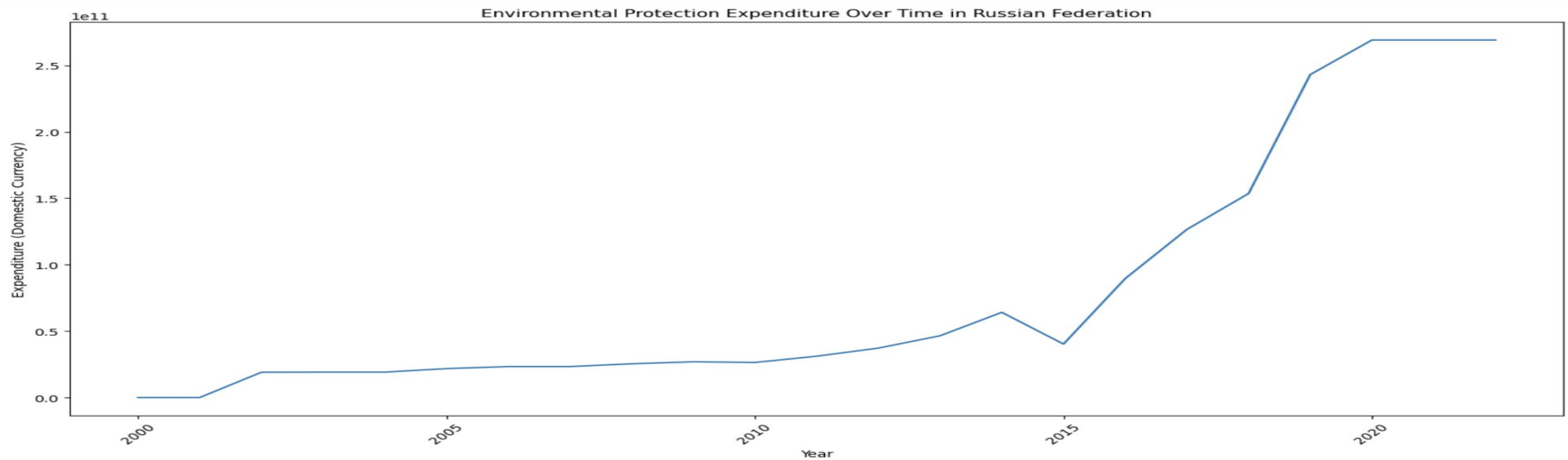
Environmental Protection Expenditure Over Time in Japan

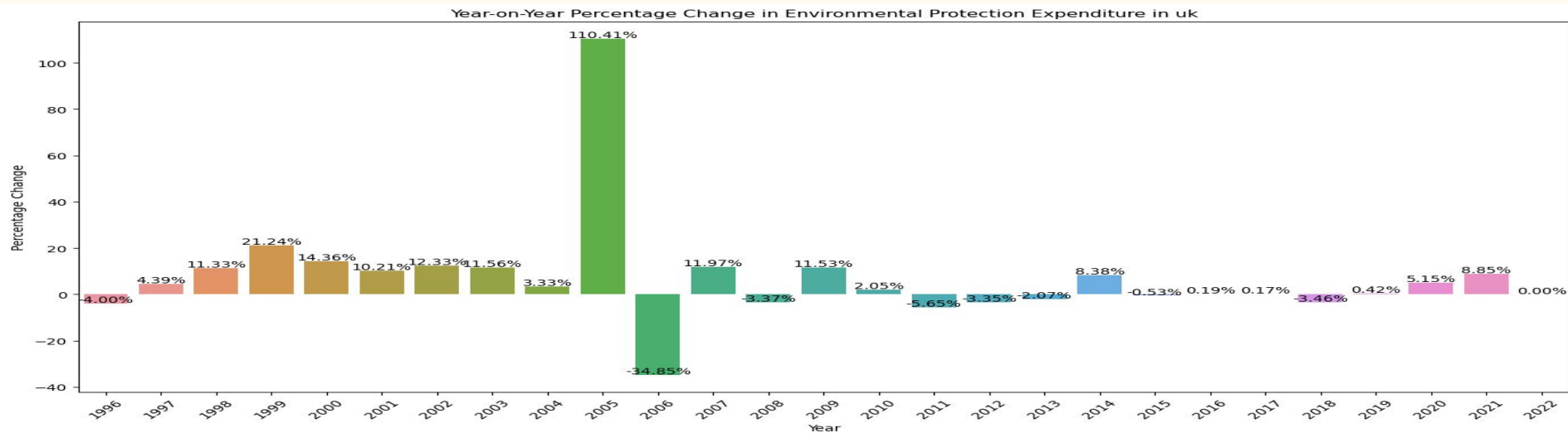
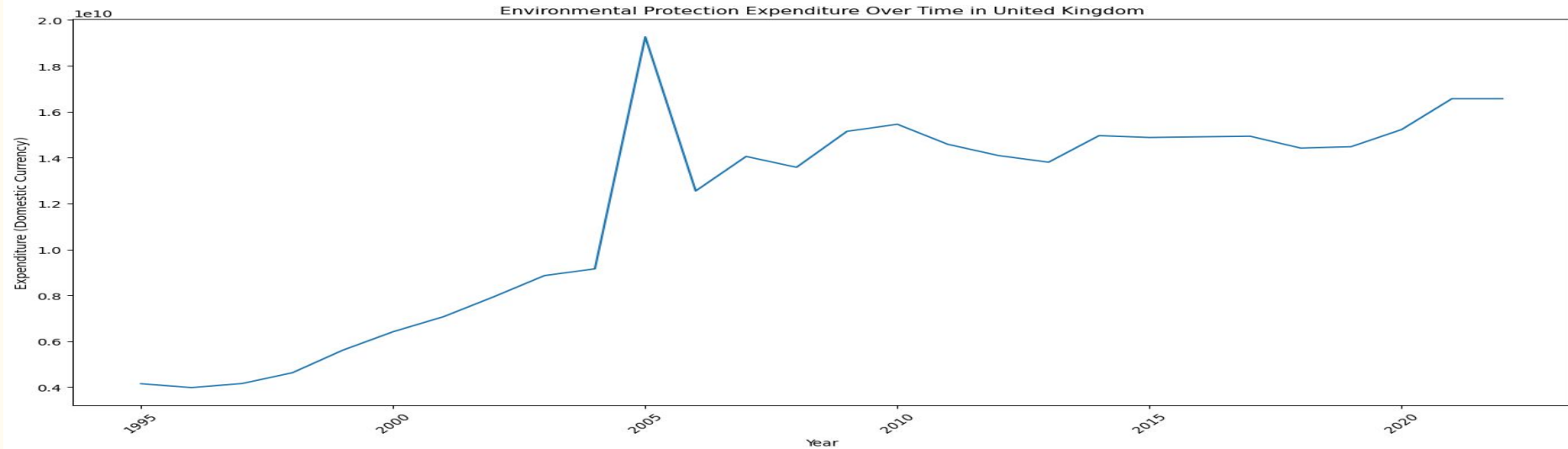


Year-on-Year Percentage Change in Environmental Protection Expenditure in Japan









Summary

From the graph, we can see that all the countries are in the upward trending on spending on Environmental Protection.



Conclusion:

- **Temperature Changes:** Canada and Russia have experienced the highest temperature changes, while India has the lowest.
- **Extreme Weather Events:** Canada and Russia have seen the most significant increase in extreme weather events, correlating with their high temperature changes.
- **CO2 Emissions:** Sectors contributing the most CO2 emissions include electricity/heat, transport, manufacturing/construction, and agriculture.
- **Correlation:** There's a strong positive correlation between temperature rise in Russia, Canada and the increase in extreme weather events.
- **Environmental Protection Expenditure:** All countries show an increasing trend in environmental protection spending.

Questions?