DATA ANALYSIS PROJECT

PROJECT TITLE :

Global Data Dashboard - Interactive Analysis of Country Parameters Using Power BI

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<u>INTRODUCTION</u>

This project aims to provide a comprehensive overview of global conditions by leveraging the power of data visualization**.** Through the meticulous analysis of 2023 data and the utilization of interactive Power BI dashboards, we seek to uncover trends, patterns, and correlations that can inform policy decisions and strategies for a sustainable future.

By effectively utilizing the power of data visualization and analysis within a Power BI framework, countries can gain invaluable insights into their relative standing on a global scale and this can help in identifying the potential areas of intervention and strategic planning. Ultimately, this tool will serve as a valuable resource for policymakers, researchers and organizations seeking insights into global development.

DATASET

Source :

The dataset used in the project is publicly available on Kaggle at the following link :
https://www.kaggle.com/datasets/nelgiriyewithana/countries-of-the-world-2023/data

Features Used in Analysis :

- **Country:** Name of the country.
- **Density (P/Km2):** Population density measured in persons per square kilometer.
- **Birth Rate:** Number of births per 1,000 population per year.
- **Population:** Total population of the country.
- **Urban Population:** Percentage of the population living in urban areas.
- **GDP:** Gross Domestic Product, the total value of goods and services produced in the country.
- **Tax Revenue (%):** Tax revenue as a percentage of GDP.
- **Population: Labor Force Participation (%):** Percentage of the population that is part of the labor force.
- **Unemployment Rate:** Percentage of the labor force that is unemployed.
- **Life Expectancy:** Average number of years a newborn is expected to live.
- **Infant Mortality:** Number of deaths per 1,000 live births before reaching one year of age.
- **Maternal Mortality Ratio:** Number of maternal deaths per 100,000 live births.
- **Agricultural Land (%):** Percentage of land area used for agricultural purposes.
- **Forested Area (%):** Percentage of land area covered by forests.
- **CO2 Emissions:** Carbon dioxide emissions in tons.

VISUALIZATIONS AND ANALYSIS

World Population Analysis - 2023 :
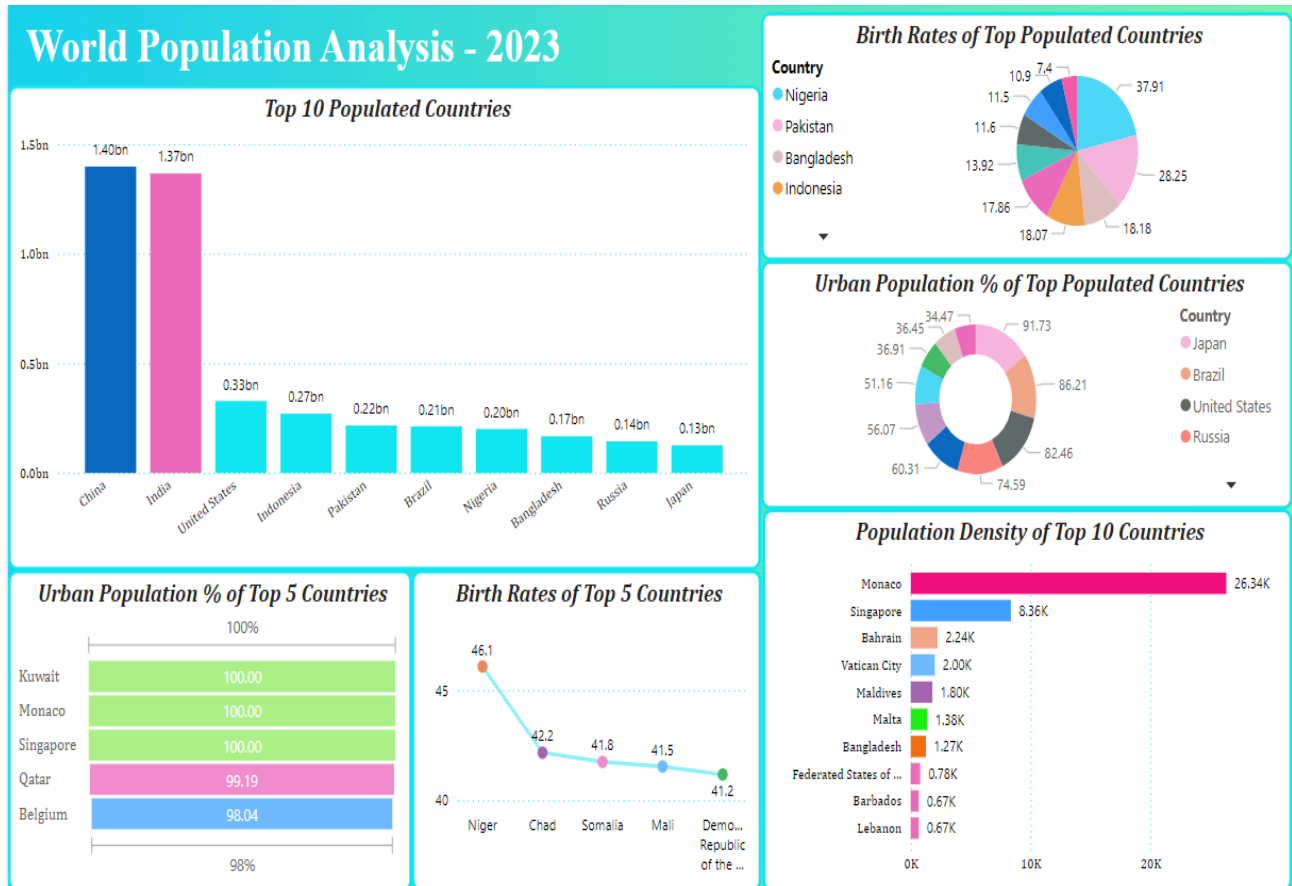
Insights :

Population Distribution:

- China and India are the most populous countries with approximately 1.4 billion and 1.3 billion population respectively.
- There is a significant population gap between these two giants and the rest of the countries across the world.

Birth Rates:

- There is a stark contrast in birth rates between developing and developed countries. Countries like Nigeria, Pakistan have significantly higher birth rates among other top populated countries.
- Developed countries like China, Japan and the United States exhibit significantly lower birth rates . Notably, Japan has one of the lowest rates globally.
- Niger has the highest birth rate globally which indicates rapid population growth.

Urbanization:

- Kuwait, Monaco, and Singapore exhibit nearly complete urbanization, with urbanization percentages approaching 100%, indicative of developed economies.
- A clear trend shows many developing countries with lower urbanization rates, suggesting potential for future growth in urban areas.
- Japan indicates a high urbanization rate of 91.73% while India has a lower urbanization rate of 34.47%.

Population Density:

- Monaco and Singapore stand out as exceptional cases in terms of population density due to their high urbanization rates. Monaco has the world's highest population density, with about 26,000 people per square kilometer.
- Among the top 10 populated countries across the world , Bangladesh has the highest population density of 1270 people per square kilometer.

World Economics Analysis - 2023 :
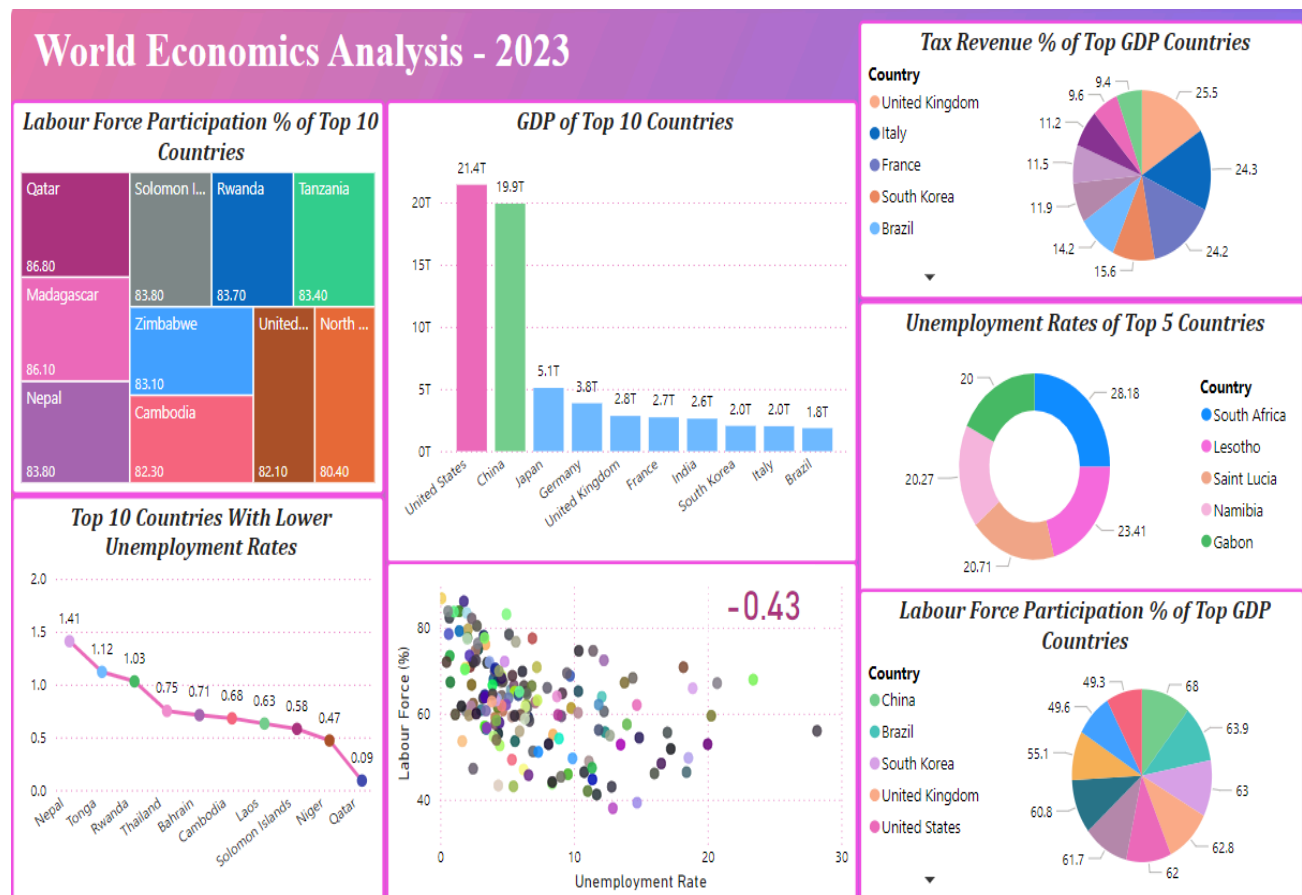
Insights :

GDP:

- The United States and China dominate the global economic landscape, with GDPs of approximately $21.4 trillion and $19.9 trillion, respectively.
- This represents a significant gap between these two economic powerhouses and the rest of the world.

Labor Force Participation:

- Qatar and Madagascar stand out with exceptionally high labor force participation rates, both approximating 86%, signifying robust workforce contributions to their respective economies.
- Labor force participation rates among the top 10 GDP countries exhibit a mixed pattern. China demonstrates a substantial labor force participation rate of around 68%, while the United States, despite its leading global economy, exhibits a rate of approximately 62%.
- In contrast, India and Italy report lower labor force participation rates compared to other top-tier economies.

Unemployment Rates:

- South Africa has one of the highest unemployment rates of 28.8 % globally.
- Qatar stands as a global outlier with a remarkably low unemployment rate of just 0.1%, highlighting a robust labor market.

Correlation (Labour Force participation and Unemployment Rates):

- The relationship between labor force participation and unemployment rates is inversely correlated, with a coefficient of -0.43, indicating a moderate negative association.
- Countries such as Nepal, Qatar, Rwanda, Cambodia, and Solomon Islands support the inverse relationship between the two parameters. They come under the top 10 countries having least unemployment rates as well as having high labor force participation.
- Qatar, in particular, demonstrates an exceptionally high labor force participation rate of 86% coupled with a near-zero unemployment rate of 0.1%.

Tax Revenue:

- The United Kingdom, Italy, and France demonstrate higher tax revenue as a percentage of GDP compared to other top 10 economies.
- This contrasts with the United States and China, which, despite their substantial GDP figures, exhibit lower tax revenue ratios.

World HealthCare Analysis - 2023
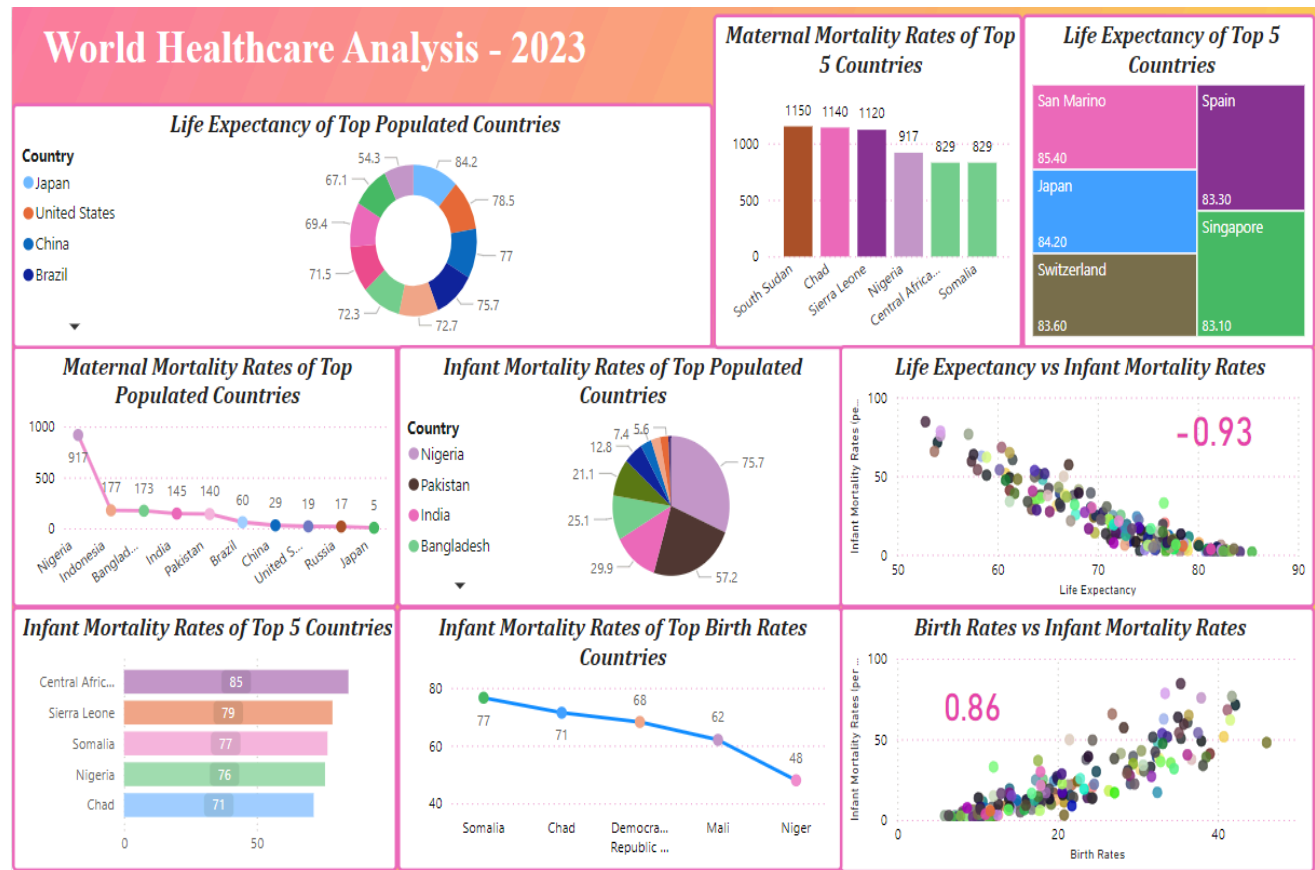
Insights :

Life Expectancy:

- San Marino exhibits the world's highest life expectancy of 85.4 years.
- Among the top populated nations Japan leads with a substantial life expectancy of 84.2 years. It ranks among the top five nations with the longest life spans.
- In contrast, countries such as India, Pakistan, and Nigeria grapple with lower life expectancy rates.

Infant Mortality Rates:

- The Central African Republic faces a severe public health crisis, grappling with the world's highest infant mortality rate of approximately 85 deaths per 1,000 live births.
- Among top populated nations , Nigeria exhibits high infant mortality rates of around 76 significantly affecting its overall life expectancy. It ranks among the top five countries globally in terms of infant mortality.
- Developed economies such as China, the United States, and Japan have achieved substantially lower infant mortality rates, with Japan leading the way and contributing to its high life expectancy.

Correlation (Life Expectancy and Infant Mortality Rates):

- A strong inverse correlation exists between life expectancy and infant mortality rates, with a coefficient of -0.93, indicating a robust relationship.
- Developed nations like Japan, China, and the United States exemplify this trend, boasting low infant mortality rates and correspondingly high life expectancies. Japan stands out with a remarkable life expectancy of 84.2 years and an exceptionally low infant mortality rate of approximately 1.8 deaths per 1,000 live births.
- In contrast, Nigeria ranked as one of the top five nations with the highest infant mortality rates, it also exhibits a lower life expectancy of around 54 years, further reinforcing the inverse correlation.

Correlation (Birth Rates and Infant Mortality Rates):

- A strong positive correlation exists between birth rates and infant mortality rates, with a coefficient of 0.85, indicating a clear relationship. Countries like Somalia and Chad support this trend, ranking among the top five nations globally for both high birth rates and infant mortality rates.
- In contrast, developed economies such as China, the United States, and Japan have achieved lower rates for both indicators.
- Nigeria also contributes to this pattern, experiencing both high birth and infant mortality rates, which consequently impacts its overall life expectancy and population growth.

Maternal Mortality Rates:

- South Sudan faces a critical public health crisis, reporting the highest global maternal mortality rate. Chad and Sierra Leone also rank among the top five countries with the most significant maternal mortality challenges.
- Within the most populous nations, Nigeria carries an exceptionally high maternal mortality rate of approximately 917 deaths per 100,000 live births, placing it among the top five globally.
- Developed economies like Japan have achieved remarkable progress, boasting minimal maternal mortality and infant mortality rates contributing to its high life expectancy.

World Environmental Analysis - 2023
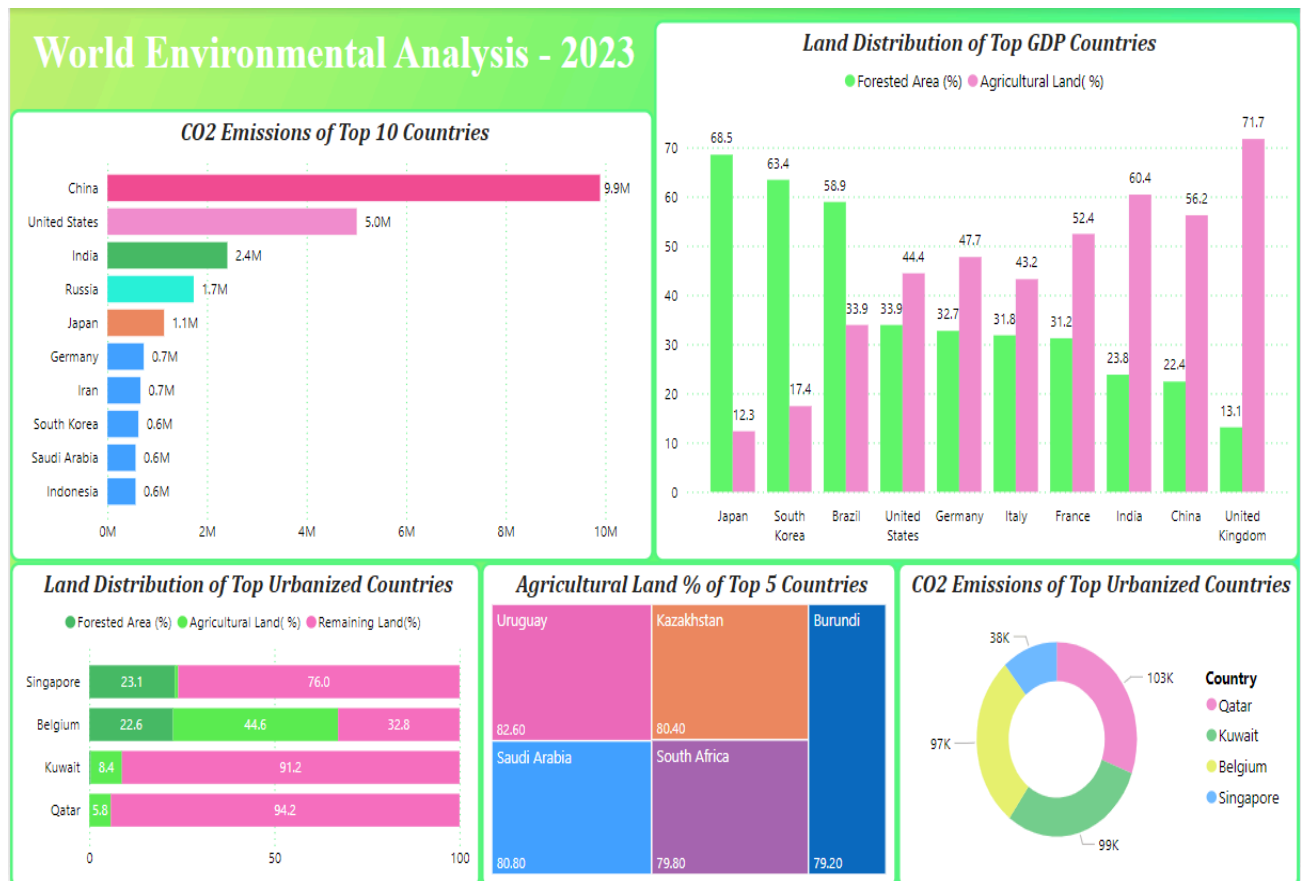
Insights :

CO2 Emissions:

- China and the United States are the world's largest contributors to carbon dioxide emissions, with China's substantial output significantly impacting global climate change.
- Several highly populated nations, including India, Russia, and Japan, are significant contributors to global carbon emissions reflecting their growing industrialization and economic development.
- Highly urbanized countries like Qatar , Kuwait , Singapore , Belgium contribute disproportionately to CO2 Emissions.

Land Distribution:

- Countries like Uruguay, Saudi Arabia, Kazakhstan, and South Africa are heavily reliant on agriculture, with approximately 80% of their land dedicated to farming.
- The United Kingdom stands out with a substantial 72% of its land allocated to agriculture, followed by India at 60%. In contrast, Japan allocates minimal land to farming but maintains a substantial forest cover of around 68.5%.
- Highly urbanized countries often prioritize development over food production, while Belgium maintains a relatively larger agricultural footprint compared to its urban counterparts.
- Singapore exemplifies the extreme opposite, with agriculture occupying only 1% of its land area.
- Qatar and Kuwait present a stark difference, with negligible forest and agricultural land areas.

<u>CONCLUSION</u>

The analysis presented in this report underscores the intricate interplay between population, health, environment, and economy. Global disparities in these areas are evident, with significant variations across countries. Developed nations generally exhibit better health outcomes and economic conditions while developing countries face substantial challenges.

The analysis highlights the environmental challenges posed by rapid urbanization and industrialization, exemplified by high CO2 emissions and deforestation rates in certain regions. Balancing economic growth with environmental sustainability is a critical challenge for many countries.

Understanding these complex relationships is crucial for informed decision-making and the development of effective strategies to improve human well-being and protect the environment.

<u>Project Link</u> :

<u>https://github.com/tarushirastogi/Global-Data-Analysis</u>