ST. JOSEPH'S COLLEGE (AUTONOMOUS),

IRINJALAKUDA

DEPARTMENT OF COMPUTER SCIENCE

WORLD VIEW DATA ANALYSIS

Submitted by

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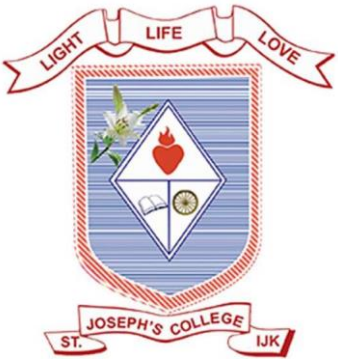
(Reg.No. SJAWMDA007)

Submitted in the partial fulfilment of the degree of

Master of Science (M.Sc) in DATA ANALYTICS



Under the guidance of

Ms. Chippy Maria Antony

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ACKNOWLEDGEMENT

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Date: SHANUFA NAZRIN P S

DECLARATION

I hereby declare that the project entitled "WORLD VIEW DATA ANALYSIS" submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person or material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

Signature:

Place:

Name: SHANUFA NAZRIN P S

Date:

Reg.No: SJAWMDA007

CERTIFICATE

This is to certify that the project report entitled "**WORLD VIEW DATA ANALYSIS**" was submitted by SHANUFA NAZRIN P S (SJAWMDA007) to St. Joseph's College (Autonomous), Irinjalakuda for the award of the degree of Master of Science (M.Sc.) in Data Analyticsis a bonafide record of the project work carried out by him/her under my supervision and guidance. The content of the report, in full or parts have not been submitted to anyother institute or university for the award of any other degree or diploma.

Ms. Chippy Maria Antony — Project Guide

Ms. Reesha P U — Head of the Department

Department of Computer Science

St. Joseph's College (Autonomous), Irinjalakuda

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Certified that the candidate was examined by us in the Project Viva Voice Examination held on _____ and his/her Register Number is _____

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Certificate of Completion

This is to certify that **SHANUFA NAZRIN P S** been employed as **Intern** in KVJ Analytics from 04/12/2023 to 25/05/2024.

During her time with our organisation **SHANUFA NAZRIN P S** has remained dedicated and loyal to her work and responsibilities.

For KVJ Analytics,

Authorised Signatory

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ABSTRACT

This project explores the Tableau, a powerful data visualization software that allows to create interactive and shareable dashboards for the analysis of world view data, World view frames global trends with indicators on population,population density, urbanization,GNI and GDP etc.The World view online tables present indicators measuring the world's economy and progress toward improving lives, achieving sustainable development, providing support for vulnerable populations, and reducing gender disparities. In an era dominated by vast amounts of data, understanding global trends and indicators is paramount for informed decision-making and strategic planning.This project endeavors to leverage the power of Tableau to visualize and analyze key world data indicators,size of economy,poverty,sustainability and women development.The World Bank plays a critical role in the world view data landscape by collecting, managing,and disseminating development data to support evidence-based policymaking, research, and advocacy efforts aimed at promoting sustainable and inclusive development worldwide.

Using Tableau's versatile visualization tools,delve into the economic landscape, presenting dynamic visualizations of GDP growth rates,population,surface area,poverty,availability of resourses,primary education rate sectoral contributions, and many other information across countries.Tableau is widely used across various industries for data analysis,business intelligence and storytelling with data.With Tableau many visualizations like pie chart,area chart,bar graphs,scatter plots and grouping, sets,calculated fields,parameters for deeper analysis and visualizations is created and then combine these visualizations into interactive dashboards.In summary,this project showcases the transformative potential of Tableau in unlocking insights from world view data, facilitating informed decision-making, and advancing our collective understanding of the complex dynamics shaping our global society.

LIST OF FIGURES

CHAPTER-1

INTRODUCTION

In an increasingly interconnected world, understanding global development trends and challenges is paramount for informed decision-making and effective policy formulation. The World Bank's World Development Indicators (WDI) database serves as a rich repository of development data,encompassing a wide range of socio-economic indicators from countries around the globe. However, unlocking the insights buried within this vast dataset can be daunting without the proper tools and methodologies.This project aims to bridge this gap by harnessing the power of data visualization and interactive dashboards to explore the wealth of information contained within the WDI database. Through dynamic visualizations and intuitive interfaces, we seek to provide stakeholders with actionable insights into key development areas such as economic growth, poverty reduction, education, healthcare, gender equality, employment and environmental sustainability.

Project begins by curating relevant datasets from the WDI database,selecting indicators that are indicative of global development progress and challenges.These indicators span diverse domains,including GDP growth,income inequality,literacy rates, access to clean water,maternal mortality and CO2 emissions,among others.Using industry-leading data visualization tools such as Tableau, we transform raw data into compelling visual narratives.Interactive dashboards allow users to explore trends, compare countries, and drill down into specific indicators of interest.Whether it's tracking progress towards Sustainable Development Goals (SDGs), identifying regional disparities, or assessing the impact of policy interventions, our visualizations offer a comprehensive view of global development dynamics.Furthermore,project emphasizes accessibility and user engagement.Work prioritize the creation of user-friendly interfaces that cater to a diverse audience, including policymakers, researchers, educators, students, and the general public. By democratizing access to development data and fostering data literacy, we empower stakeholders to engage meaningfully with global development issues and drive positive change in their respective domains.

Data contains several information of many countries. .The dataset were collected from the sources Food and Agriculture Organization and World Bank population estimates, International Comparison Program, World Bank | World Development Indicators database, World Bank | Eurostat-OECD PPP Programme,World Bank national accounts data, and OECD National Accounts data files etc.From the visualization of this datas we can find many informations like top populated countries,countries with low GDP,least women development and also we can filter out the country from these massive data easily due to the visualization of data by using Tableau.

The dataset originates from the World Bank,which is a well-known international financial institution that provides data and research on various global development indicators, including economic, social, and environmental factors.The World Bank is an international financial institution that provides loans and grants to the governments of low and middle-income countries for the purpose of pursuing capital projects. Here are some key points about the World Bank. The primary goal of the World Bank is to reduce poverty by providing financial and technical assistance to developing countries for development projects that aim to improve infrastructure, healthcare, education, and other sectors.The World Bank Group consists of several institutions, including the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA).The World Bank provides a wealth of data on various economic,social, and environmental indicators through its World Development Indicators (WDI) database. These indicators cover a wide range of topics and are used by policymakers, researchers, analysts, and the general public to monitor global trends, assess development progress, and inform decision-making.

The dataset World Development Indicators (WDI) is the World Bank's premier compilation of cross-country comparable data on development.The World Development Indicators is a compilation of relevant, high-quality and internationally comparable statistics about global development and the fight against poverty.World Development Indicators includes data spanning more than 60 years from 1960. World view frames global trends with indicators on population, population density, urbanization, GNI, and GDP.As in previous years, the World view online tables present indicators measuring the world’s economy and progress toward improving lives,achieving sustainable development,providing support for vulnerable populations, and reducing gender disparities.

Visualizations of World Bank indicator data help policymakers and decision-makers understand global trends, compare countries performance on various indicators, and identify areas for policy intervention. The World Bank indicators often track progress towards global development goals, such as the Sustainable Development Goals (SDGs). Visualizations of these indicators allow stakeholders to monitor progress over time, assess the effectiveness of interventions, and prioritize areas that require additional attention and resources. Researchers and analysts use World Bank indicator data visualizations to conduct in-depth studies, identify patterns and correlations, and generate insights into economic, social, and environmental trends.Visualizations facilitate exploratory data analysis and hypothesis testing, enabling researchers to uncover relationships and trends that may not be apparent from raw data alone.

Overall, World Bank indicator data visualizations play a crucial role in informing decision-making, monitoring progress, raising awareness, facilitating research, and promoting accountability in global development efforts. They serve as powerful tools for understanding complex issues,communicating insights, and driving positive change at the local, national, and international levels.

TITLE OF THE STUDY

World view data analysis and visualization using Tableau

AIM AND OBJECTIVE

To analyze and visualize key world data indicators related to size of economy, poverty, sustainability,women's development,and unemployment across multiple countries using Tableau, with the aim of identifying trends, patterns, and disparities to inform evidence-based decision-making and policy formulation.

The objective of the project is to transform raw data into visual representations that are insightful, informative, and actionable.Visualizations of indicators such as population density Gross Domestic Product (GDP), Gross National Income (GNI), and provide insights into the size and growth of economies,for tracking progress towards poverty reduction indicators such as Poverty headcount ratio,International poverty line population,labour productivity and other indicators also visualized.Also promoting sustainability and women's development serve critical purposes, including informing decision-making,tracking progress towards development goals and promoting inclusive and sustainable development of different countries worldwide.By this we can compare countries economic performance,identify emerging economies and assess the impact of economic policies and external factors on economic growth.

CHAPTER-2

LITERATURE REVIEW

1. **"Interactive Visualization of Healthcare Data Using Tableau" by Inseoko and Hyejung Chang**

   This study aims to encourage the use of Tableau for interactive visualization and analysis of healthcare data,which can be particularly beneficial for improving healthcare policies and services. Although Tableau is already used in some healthcare settings, its adoption is not widespread. The paper outlines the installation process for Tableau and provides a detailed procedure for creating visualizations using healthcare data as an example**.** To explore the visualization of healthcare data using Tableau for begin-ners, this paper describes the creation of a simple view for the average length of stay of colon cancer patients.Since Tableau provides various visualizations and customizations, the level of analysis can be increased with small multiples,view filtering, mark cards, and Tableau charts. Tableau is a software that can help users explore and understand their data by creating interactive visualizations. The software has the advantages that it can be used in conjunction with almost any data-base and it is easy to use by dragging and dropping to create an interactive visualization expressing the desired format.

2. **Visualisation of urban sprawl within the city using tableau by Syaimak Abdul Shukor1 , Mas Al Hafiz Samsir**

   The paper addresses the critical issue of urban sprawl, which leads to an imbalance between urban and rural development. Key problems include non-optimal land use, dispersal of development, conversion of land to municipal use, and reduction in forest and agricultural areas. This sprawl complicates effective governance and increases costs due to scattered development. Current visualizations are limited, often failing to accurately depict village-in-the-city boundaries.This study introduces a structured visualization using Tableau to better define these boundaries and assist in development planning. The main objective is to develop a Tableau dashboard to visualize urban, rural, and village-in-the-city boundaries, providing clear, actionable insights for stakeholders. This will aid in effective governance and planning, especially for rural areas within urban settings. The paper presents a comprehensive approach to addressing urban sprawl through data visualization. It effectively demonstrates the capability of Tableau in transforming complex datasets into clear and useful visualizations. The methodology is sound, and the results are promising, showing potential for broader application. However, future studies should consider a larger dataset and additional regions to validate the scalability and adaptability of the approach.The developed dashboard successfully visualizes the village-in-the-city boundaries, a feat not previously achieved with graphic maps.

3. **Visual Analytics in Effects of Gross Domestic Product to Human Immunodeficiency Virus Using Tableau by Eunbi Kim and Ching-Yu Huang**

   The study's primary objective is to utilize Tableau to reveal correlations between GDP and HIV/AIDS data. It seeks to provide clear visual insights into how economic status impacts health outcomes, specifically the prevalence of HIV.The methodology is robust, integrating diverse datasets and employing various visualization techniques to present clear, actionable insights. However, future research should explore more variables and longer time spans to validate and expand upon these findings. Additionally, considering other socioeconomic indicators and their combined effects on health outcomes could provide a more comprehensive understanding of the factors influencing HIV prevalence.It Provides a clear, interactive way to understand the socioeconomic factors affecting HIV spread.Aids in policy-making and resource allocation to combat HIV more effectively by targeting economically disadvantaged areas.Also it enhances understanding of the socioeconomic determinants of health.Highlights the importance of addressing poverty to improve health outcomes.

4. **Data visualization view with tableau by s. vasundhara**

   The study effectively demonstrates how Tableau can be used to visualize and analyze COVID-19 healthcare data.By presenting a clear, step-by-step procedure, it encourages the adoption of Tableau in healthcare for better data-driven decision-making**.**To illustrate the use of Tableau for beginners, the paper describes creating a simple view showing the average length of stay for COVID-19 patients. Tableau's customization options enhance the analysis with features like small multiples, view filtering, mark cards, and various chart types. Tableau facilitates data exploration and understanding through interactive visualizations. Its compatibility with numerous databases and ease of use through drag-and-drop functionality makes it a valuable tool for healthcare data analysis. By demonstrating the visualization of COVID-19 data, this paper aims to promote the widespread use of Tableau in the healthcare industry.

5. **Indoor Air Pollution: A Review on the Challenges in Third World Countries by Moses Eterigho Emetere, Joshua Fadij**

   This study is a wholistically examined indoor pollution. A total of fifty-six articles was reviewed in addition to the data obtained from MERRA-2. The study observed that indoor air pollution dynamics are more complex—compared to outdoor air pollution. It was observed that the possibility to control indoor air pollution is based on the type of pollutants, the reactive chemistry of the pollutants, and ventilation in the building. This review shows that poverty is one of the many reasons why indoor air pollution would be a source of menace for a long time in third-world countries. Several solutions to curbing indoor air pollution were considered with a principal focus on cost and availability.The plant-based technique was identified as a perfect solution to indoor air pollution control in third-world countries but the local architecture and lifestyle of most third-world countries constitute a threat to its adoption.

6. World unemployment problem and the unemployment rate forecasting by Feilu Sun

The aim of the study is explicitly stated to explore and predict unemployment in depth. This is crucial for setting the context of the research**.**The abstract summarizes that the world unemployment rate is expected to remain high, highlighting the severity of the issue. It acknowledges the impact of various external factors (e.g., epidemics, natural disasters, technological advancements, policy changes) on unemployment, which adds depth to the analysis.The world unemployment problem is still relatively serious, and according to the forecast results, the unemployment rate of the world population will remain relatively high in the coming years. At the same time, relatively large increases and decreases in unemployment may occur due to the spread of various types of epidemics, the generation of natural disasters, the progressive development of science and technology, changes in policies, changes in the population base, changes in employment patterns and other factors. The results show that the ARIMA model is suitable for predicting the values of these variables. These models perform well in capturing patterns and trends in the data, and the forecasts generated are reliable. The study also highlights the importance of model evaluation and residual hypothesis testing to ensure forecast accuracy. Future research could explore the use of other time series forecasting methods, such as machine learning algorithms, to compare their performance with ARIMA models. Future research could also consider using multiple data sets and nonstationary tests. In summary, this study demonstrates the applicability of the ARIMA model in predicting the value of this variable. These models do a good job of capturing patterns and trends.

7. Life expectancy and Maternal Mortality Ratio (MMR) comparison (1980 – 2021) – United States & Sri Lanka, using World Bank data - Part 1 by Dilojan Senanayake

The provided study contains a mix of statistical data, references, and comparisons regarding maternal mortality ratios (MMR), life expectancy, and COVID-19 fatality rates. It also discusses potential reasons for variations in these statistics across different countries, such as the United States, Sri Lanka, and Bangladesh. It references multiple data sources, including the United Nations Population Division, Eurostat, and the U.S. Census Bureau, among others. This is good practice, but more detail on how these sources interact and the potential discrepancies between them would be beneficial. The comparison of life expectancy and MMR between the United States and Sri Lanka is interesting but could be more coherent. The text should clearly state the years being compared and ensure that all data points are directly comparable. The comparisons of COVID-19 fatality rates in Bangladesh, Sri Lanka, and the United States are noteworthy. However, the text should delve deeper into the reasons behind these differences, such as healthcare infrastructure, government response, and public health policies.

CHAPTER 3

DATA AND TOOL USED

DATASET

The Powerful data visualization tool Tableau is used to analysis. The dataset is World Development Indicators (WDI) dataset, provided by the World Bank, is a comprehensive compilation of global development data covering various socio-economic indicators across countries.World view frames global trends contain different catogory of datasets like size of economy,poverty,sustainability,women development and unemployment with various indicators like GDP,GNI,Population,surface area,women's seat in parliament etc. Visualizations of these datas using powerful tools for raising public awareness and educating people about global issues and challenges faced by different countries.

SIZE OF ECONOMY

Population, total - Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values shown are midyear estimates.

Population density (people per sq. km of land area)-Population density is midyear population divided by land area in square kilometers. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. Land area is a country's total area, excluding area under inland water bodies, national claims to continental shelf, and exclusive economic zones. In most cases the definition of inland water bodies includes major rivers and lakes.

GNI, Atlas method (current US$)-GNI (formerly GNP) is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. Data are in current U.S. dollars. GNI, calculated in national currency, is usually converted to U.S. dollars at official exchange rates for comparisons across economies, although an alternative rate is used when the official exchange rate is judged to diverge by an exceptionally large margin from the rate actually applied in international transactions.

GNI per capita, Atlas method (current US$) -GNI per capita (formerly GNP per capita) is the gross national income, converted to U.S. dollars using the World Bank Atlas method, divided by the midyear population. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad.

GNI, PPP (current international $)-This indicator provides values for gross national income (GNI. Formerly GNP) expressed in current international dollars converted by purchasing power parity (PPP) conversion factor. Gross national income is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. PPP conversion factor is a spatial price deflator and currency converter that eliminates the effects of the differences in price levels between countries.

GNI per capita, PPP (current international $)-This indicator provides per capita values for gross national income (GNI. Formerly GNP) expressed in current international dollars converted by purchasing power parity (PPP) conversion factor. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad.

GDP growth (annual %)-Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

GDP per capita growth (annual %)-Annual percentage growth rate of GDP per capita based on constant local currency. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

POVERTY

Poverty lines are thresholds used to define the minimum level of income or consumption needed to meet basic needs and avoid poverty. These thresholds vary by country and are often set based on the cost of a basket of goods and services necessary for subsistence living.

Poverty headcount ratio at $2.15 a day (PPP) (% of population)-Poverty headcount ratio at $2.15 a day is the percentage of the population living on less than $2.15 a day purchasing power adjusted prices. As a result of revisions in PPP exchange rates,poverty rates for individual countries cannot be compared with poverty rates reported in earlier editions.

Prevalence of stunting, height for age (modeled estimate, % of children under 5)-Prevalence of stunting is the percentage of children under age 5 whose height for age is more than two standard deviations below the median for the international reference by population ages 0-59 months.

Mortality rate, under-5 (per 1,000 live births)-Under-five mortality rate is the probability per 1,000 that a newborn baby will die before reaching age five, if subject to age-specific mortality rates of the specified year.

Maternal mortality ratio (modeled estimate, per 100,000 live births)-Maternal mortality ratio is the number of women who die from pregnancy-related causes while pregnant or within 42 days of pregnancy termination per 100,000 live births. The data are estimated with a regression model using information on the proportion of maternal deaths among non-AIDS deaths in women ages 15-49, fertility, birth attendants, and GDP measured using purchasing power parities (PPPs).

Incidence of HIV, ages 15-49 (per 1,000 uninfected population ages 15-49)-Number of new HIV infections among uninfected populations ages 15-49 expressed per 1,000 uninfected population in the year before the period.

Incidence of tuberculosis (per 100,000 people)-Incidence of tuberculosis is the estimated number of new and relapse tuberculosis cases arising in a given year, expressed as the rate per 100,000 population. All forms of TB are included, including cases in people living with HIV. Estimates for all years are recalculated as new information becomes available and techniques are refined, so they may differ from those published previously.

Mortality caused by road traffic injury (per 100,000 population)-Mortality caused by road traffic injury is estimated road traffic fatal injury deaths per 100,000 population.

Primary completion rate, total (% of relevant age group)-Primary completion rate, or gross intake ratio to the last grade of primary education, is the number of new entrants (enrollments minus repeaters) in the last grade of primary education, regardless of age, divided by the population at the entrance age for the last grade of primary education. Data limitations preclude adjusting for students who drop out during the final year of primary education.

Vulnerable employment, female (% of female employment) (modeled ILO estimate)-Vulnerable employment is contributing family workers and own-account workers as a percentage of total employment.

Vulnerable employment, male (% of male employment) (modeled ILO estimate)-Vulnerable employment is contributing family workers and own-account workers as a percentage of total employment.

GDP per person employed (constant 2017 PPP $)-GDP per person employed is gross domestic product (GDP) divided by total employment in the economy. Purchasing power parity (PPP) GDP is GDP converted to 2017 constant international dollars using PPP rates. An international dollar has the same purchasing power over GDP that a U.S. dollar has in the United States.

SUSTAINABILITY

People using safely managed drinking water services (% of population)-The percentage of people using drinking water from an improved source that is accessible on premises, available when needed and free from faecal and priority chemical contamination. Improved water sources include piped water, boreholes or tubewells, protected dug wells, protected springs, and packaged or delivered water.

People using safely managed sanitation services (% of population)-The percentage of people using improved sanitation facilities that are not shared with other households and where excreta are safely disposed of in situ or transported and treated offsite.

Access to electricity (% of population)-Access to electricity is the percentage of population with access to electricity. Electrification data are collected from industry, national surveys and international sources.

Renewable energy consumption (% of total final energy consumption)-Renewable energy consumption is the share of renewables energy in total final energy consumption.

Population living in slums (% of urban population)-Population living in slums is the proportion of the urban population living in slum households.

PM2.5 air pollution, mean annual exposure (micrograms per cubic meter)-Population-weighted exposure to ambient PM2.5 pollution is defined as the average level of exposure of a nation's population to concentrations of suspended particles measuring less than 2.5 microns in aerodynamic diameter, which are capable of penetrating deep into the respiratory tract and causing severe health damage. Exposure is calculated by weighting mean annual concentrations of PM2.5 by population in both urban and rural areas.

Adjusted net savings, including particulate emission damage (% of GNI)-Adjusted net savings are equal to net national savings plus education expenditure and minus energy depletion, mineral depletion, net forest depletion, and carbon dioxide and particulate emissions damage.

CO2 emissions (metric tons per capita)-Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.

Intentional homicides (per 100,000 people)-Intentional homicides are estimates of unlawful homicides purposely inflicted as a result of domestic disputes, interpersonal violence, violent conflicts over land resources, intergang violence over turf or control, and predatory violence and killing by armed groups. Intentional homicide does not include all intentional killing; the difference is usually in the organization of the killing.

WOMEN AND DEVELOPMENT

Life expectancy at birth, male and female (years)-Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.

Women who were first married by age 18 (% of women ages 20-24)-Women who were first married by age 18 refers to the percentage of women ages 20-24 who were first married by age 18.

Account ownership at a financial institution or with a mobile-money-service provider, male and female (% of population ages 15+)-Account denotes the percentage of respondents who report having an account (by themselves or together with someone else) at a bank or another type of financial institution or report personally using a mobile money service in the past 12 months.

Wage and salaried workers, male and female (modeled ILO estimate)-Wage and salaried workers are those workers who hold the type of jobs defined as "paid employment jobs," where the incumbents hold explicit or implicit employment contracts that give them a basic remuneration that is not directly dependent upon the revenue of the unit for which they work.

Firms with female participation in ownership (% of firms)-Firms with female participation in ownership are the percentage of firms with a woman among the principal owners.

Female share of employment in senior and middle management (%)-The proportion of females in total employment in senior and middle management. It corresponds to major group 1 in both ISCO-08 and ISCO-88 minus category 14 in ISCO-08 (hospitality, retail and other services managers) and minus category 13 in ISCO-88 (general managers), since these comprise mainly managers of small enterprises.

Proportion of seats held by women in national parliaments (%)-Women in parliaments are the percentage of parliamentary seats in a single or lower chamber held by women

Women Business and the Law Index Score (scale 1-100)-The index measures how laws and regulations affect women’s economic opportunity. Overall scores are calculated by taking the average score of each index (Mobility, Workplace, Pay, Marriage, Parenthood, Entrepreneurship, Assets and Pension), with 100 representing the highest possible score.

UNEMPLOYMENT AND EMPLOYMENT DATASET

The unemployment dataset contains unemployment rate of persons with catogories of basic,intermediate and advanced level of education.

Employment dataset contains males and females employment percentage in various sectors like agriculture,service and industrial of different countries.

TOOL USED

TABLEAU

Tableau is used in this project.It is a powerful data visualization tool that allows users to create interactive and shareable dashboards and reports.It is widely used in various industries for data analysis, reporting, and business intelligence purposes.With Tableau, users can connect to different data sources, including databases, spreadsheets, and cloud services and then create visualizations such as charts, graphs, maps, and tables to explore and communicate insights from their data.By using tableau world view dataset is visualized.Visualization helps uncover patterns, trends, and relationships within data that may not be apparent from raw numbers or text alone. By representing data visually through charts, graphs, maps, and other visualizations, analysts can quickly identify insights and make data-driven decisions.Tableau offers a variety of chart types to visualize data effectively.Calculated fields which is an expressions in tableau is created to categorize and analyze your data.Also sets are created which is a custom fields that define subsets of data based on conditions or criteria.

In Tableau, parameters allow users to create dynamic and interactive elements within their visualizations. Parameters act as placeholders for values that users can input and then use to control various aspects of their analysis, such as filtering, calculations, and visualizations. Creating a parameter in Tableau and integrating it into a scatter plot can provide users with a dynamic way to interact with the data.Tableau features a user-friendly interface with drag-and-drop functionality, making it easy for users to explore and analyze data without requiring extensive programming knowledge.Tableau can connect to a wide range of data sources, including databases,spreadsheets,cloud services and web data connectors, allowing users to work with data from multiple sources in one platform.Tableau enables the creation of interactive dashboards that allow users to filter, drill down and explore data dynamically,facilitating deeper insights and analysis.

CHAPTER-4

INTRODUCTION TO TABLEAU

Tableau is a powerful data visualization tool that allows users to create interactive and visually appealing dashboards and reports from various data sources. Tableau can connect to a wide range of data sources, including databases, spreadsheets, cloud services, and web data connectors.This allows users to access and analyze data from multiple sources within a single interface. Tableau Software was founded in 2003. In 2010, Tableau launched Tableau Public, a free version of its software that allowed users to create and share interactive visualizations online. In June 2019, Salesforce, a leading cloud-based software company, announced its acquisition of Tableau.

FEATURES

Data Connectivity: Tableau can connect to various data sources, including databases (SQL, Oracle, MySQL), spreadsheets (Excel, CSV), cloud platforms (Amazon Redshift, Google BigQuery), and web data connectors. It allows users to access and analyze data from multiple sources within a single interface.

Tableau's intuitive drag-and-drop interface makes it easy for users to create visualizations and build dashboards without the need for coding or complex scripting. Users can simply drag fields from their data source onto the canvas to create visualizations, and Tableau handles the rest.

Data Blending and Joining: Tableau enables users to blend and join data from multiple sources to create unified views for analysis. Users can combine data from different databases, spreadsheets, or cloud platforms to gain a comprehensive understanding of their data.

Calculations and Expressions: Tableau provides a powerful calculation engine that allows users to create calculated fields, parameters, and expressions to perform custom calculations and add additional context to their visualizations.Users can write formulas using Tableau's formula language or use built-in functions for calculations.

Dashboards and Storytelling: Tableau enables users to create interactive dashboards that combine multiple visualizations into a single view.Users can arrange and customize visualizations, add text and images, and create interactivity between different elements of the dashboard. Additionally, users can create stories to sequence visualizations and guide viewers through a narrative.

Data Preparation: Tableau offers data preparation capabilities through Tableau Prep, a separate tool that allows users to clean, reshape, and combine data from multiple sources before analysis in Tableau Desktop.Users can perform data cleaning, deduplication, pivoting, and other data preparation tasks to ensure data quality and consistence.

Filters: Tableau provides various filtering options to allow users to focus on specific subsets of data. Users can apply filters to visualizations, dashboards, or individual worksheets to control which data is included in the analysis.

Visualization Types: Tableau offers a wide range of visualization types, including bar charts, line charts, scatter plots, heat maps, pie charts, maps, histograms, and more. Users can choose the appropriate visualization type based on their data and analytical needs.

Collaboration and Sharing: Tableau provides collaboration features that allow multiple users to work together on dashboards and reports. management features to control access to data and visualizations.

TYPES OF CHART

Bar Chart: A bar chart represents data using rectangular bars with lengths proportional to the values they represent. It's suitable for comparing discrete categories or showing changes over time.

Line Chart: A line chart connects data points with straight lines, often used to show trends and changes in data over time.

Scatter Plot: A scatter plot displays individual data points as dots on a two-dimensional graph, with one variable plotted on each axis. It's useful for visualizing the relationship between two continuous variables.

Pie Chart: A pie chart divides a circle into slices to represent the proportion of each category in the data set. It's suitable for showing the distribution of categorical data.

Area Chart: An area chart is similar to a line chart but fills the area below the line, making it easier to visualize cumulative totals or proportions over time.

Tree Map: A tree map represents hierarchical data using nested rectangles, with each rectangle's size representing a quantitative value.

Box Plot: A box plot (or box-and-whisker plot) displays the distribution of numerical data and highlights statistical measures such as median, quartiles, and outliers.

Gantt Chart: A Gantt chart visualizes project schedules by showing tasks as horizontal bars along a timeline. It's useful for project management and tracking progress.

Bullet Graph: A bullet graph is a variation of a bar chart designed to show progress towards a goal or target, often used for performance monitoring and goal tracking.

Packed Bubbles Chart: A packed bubbles chart represents data using circles of varying sizes, arranged in a hierarchical structure, often used for visualizing hierarchical or nested data.

ANALYTICS AND VISUALIZATION OPTIONS

Tableau offers various analytics options and features to enable users to perform in-depth analysis and gain insights from their data. Here are some of the key analytics options available in Tableau:

Table Calculations: Tableau provides built-in table calculations that allow users to perform calculations across rows, columns, or specific dimensions in their data. Users can create calculations such as running totals, moving averages, percent differences, and more.

Level of Detail (LOD) Expressions: LOD expressions in Tableau allow users to control the level of aggregation in their calculations independently of the visualization level. Users can create fixed, include, or exclude LOD expressions to perform calculations at different levels of detail in the data.

Forecasting: Tableau includes built-in forecasting capabilities that allow users to create forecasts for their data series. Users can specify the forecasting method, confidence intervals, and other parameters to generate forecasts for future time periods.

Trend Lines and Reference Lines: Tableau enables users to add trend lines and reference lines to their visualizations to highlight trends, compare data against benchmarks, or indicate targets. Users can customize the appearance and behavior of trend lines and reference lines based on their analytical needs.

Clusters: Tableau provides clustering analysis capabilities that allow users to identify clusters or groups within their data based on similarity or proximity. Users can apply clustering algorithms such as k-means clustering or hierarchical clustering to segment their data into clusters for further analysis.

Statistical Functions: Tableau includes a variety of built-in statistical functions that users can use to perform statistical analysis on their data. These functions include measures of central tendency, dispersion, correlation, regression analysis, hypothesis testing, and more.

Set Analysis: Tableau allows users to create sets to group data based on specific conditions or criteria. Users can perform set analysis to compare different subsets of data, analyze trends within sets, or perform calculations based on set membership.

Parameters: Parameters in Tableau allow users to create dynamic inputs that can be used to control various aspects of their visualizations, such as filters, calculations, or reference lines. Users can create parameters to enable interactive analysis and exploration of their data.

Format the Chart: Finally, format the chart as desired by adjusting colors, labels, titles, and other visual elements to improve readability and aesthetics.

Color: Color is a powerful visual encoding that can be used to differentiate categories, highlight trends, and add emphasis to data points. In Tableau, you can customize the color of marks in your visualization by dragging a dimension or measure onto the Color shelf. Tableau provides a default color palette, but you can also customize colors manually to suit your preferences. Additionally, you can create custom color legends, apply conditional formatting based on data values, and use color schemes to ensure consistency across multiple visualizations.

Size: Size is another visual encoding that can be used to convey information about data values, such as magnitude or importance. In Tableau, you can adjust the size of marks in your visualization by dragging a dimension or measure onto the Size shelf. This allows you to create visualizations where the size of marks represents a specific data attribute. You can also adjust the size range and scale to control the appearance of marks in your visualization.

Labels: Labels provide additional context and information about data points in a visualization. In Tableau, you can add labels to marks by dragging a dimension or measure onto the Label shelf. Tableau allows you to customize label formatting, positioning, and alignment to ensure clarity and readability. You can also add tooltips to provide additional information when users hover over marks in the visualization.

Shapes: Tableau allows users to customize the shape of marks in the visualization, providing an additional visual encoding option. Users can choose from a variety of predefined shapes or create custom shapes to represent specific data categories or concepts.

Annotations: Tableau supports annotations that allow users to add textual or graphical annotations to the visualization to provide context or highlight important insights. Users can position annotations manually and customize their appearance to suit the visualization's needs.

Create a Dual-Axis Chart: Start by creating a basic chart with dual axes. You can do this by dragging the desired measure (e.g., Sales) to the Rows shelf twice. This will create two separate measures on the Rows shelf, each representing a different axis.

Sort the Measures: Right-click on each measure on the Rows shelf and choose "Sort" > "Descending" to sort the measures in descending order. This will ensure that the data is sorted from highest to lowest for both sum and average values.

Synchronize Axes: To synchronize the axes, right-click on one of the axes (e.g., the right axis) and select "Synchronize Axis." This will ensure that the scales of the two axes are aligned, making it easier to compare the values between the two measures.

CHAPTER-5

METHODOLOGY

The methodology of project using Tableau for the analysis and visualization of data contains several steps

1. Prepare the data
2. Model the data
3. Visualize and analyse the data

PREPARE THE DATA

Preparing data in Tableau is the first step.It includes cleaning the data.This includes Handle missing values, outliers, and inconsistencies.The datasets is in excel format.Unwanted datas are removed from the excel sheet. Tableau provides various data preparation tools to assist in this process, including handling missing values, removing duplicates, filtering data, and converting data types. Custom calculations may also be created to derive new variables or perform data transformations as needed.

The steps taken to clean the data

- Load the datasets to Tableau
- Remove bottom datas
- Remove null values

MODEL THE DATA

- Removed unwanted data
- Replaced null values
- Removed duplicates
- Renamed columns

Modeling data in Tableau involves structuring the dataset to optimize it for analysis and visualization within the Tableau environment.This process starts with connecting to the data source and understanding its structure, including the fields and records it contains.Once connected, defining appropriate data types for each field ensures accurate representation and analysis. Additionally, calculated fields can be created to perform custom calculations or transformations on the data, allowing for more advanced analysis.
Parameters provide users with the flexibility to input values dynamically,enabling interactive exploration of the data. Sets and groups allow for the creation of subsets of data based on specific criteria or the categorization of data into meaningful clusters. Filters play a crucial role in data modeling, allowing users to focus on relevant subsets of data by applying criterias. Annotations provide additional context or explanation for specific data points or trends, enhancing the interpretability of visualizations.

CALCULATED FIELDS

- To visualize high and low population density countries.

  IF [Population density people per sq. km]> 1000 THEN 'High population density country'

  END

  IF [Population density people per sq. km]< 20 THEN 'least population density countries'

  END

- To visualize high and low Purchasing power parity gross national income of different countries

  IF [Purchasing power parity gross national income per capita $ 2022]>50000 THEN 'High ppp'
  ELSEIF [Purchasing power parity gross national income per capita $ 2022]<50000 THEN 'Low ppp'
  END

- To visualize high and low poverty rate countries
  IF [International poverty lines Population below $2.15 a day % 1]<= 2.00 THEN 'Low Poverty countries'

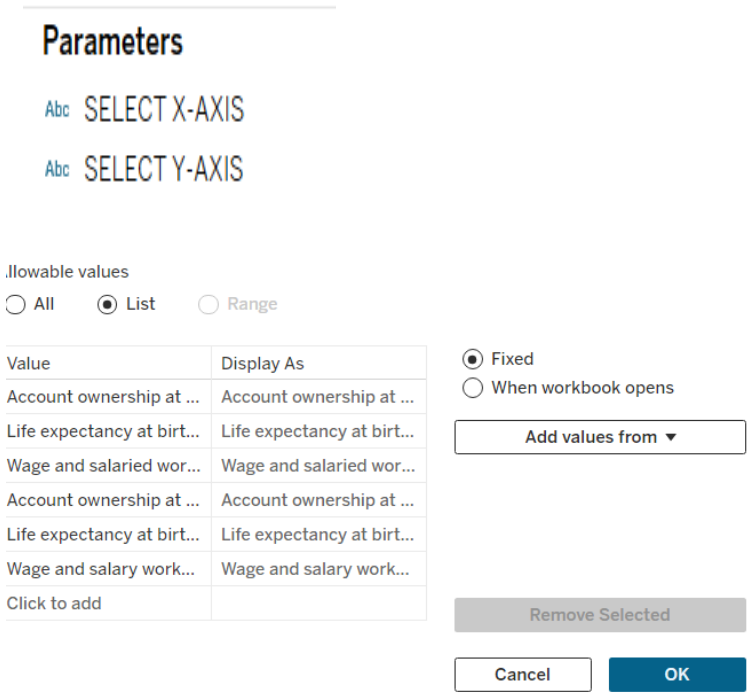
  ELSEIF [International poverty lines Population below $2.15 a day % 1]>=35.00 THEN 'high poverty countries'

  END

PARAMETER

For comparing and analysing different terms of the data, parameter and calculated field is created for visualizing it in a single scatterplot.So for that parameter select x-axis and select y-axis is created and show filter option is selected.Also calculation field x-axis and y-axis is created with the case function.And these are dropped in rows and columns.

Create Parameter: Right-click anywhere in the Data pane and select "Create Parameter" from the context menu.
Name: Enter a descriptive name for your parameter.
Data Type: Choose the data type for your parameter (e.g., integer, float, string, date).
Allowable Values: Specify the allowable values for the parameter. You can choose from options such as range, list, or computed values.
Current Value: Set the default value for the parameter.
Click OK: Once you've configured the parameter settings, click OK to create the parameter



CALCULATED FIELD

CASE [SELECT X-AXIS]

WHEN 'Account ownership at a financial institution or with a mobile-money-service provider, female (% of population ages 15+) ' THEN SUM([Account ownership at a financial institution or with a mobile-money-service provider, female (% of population ages 15+)])

WHEN 'Life expectancy at birth Female ' THEN SUM([Life expectancy at birth Female])

WHEN 'Wage and salaried workers Female % of females employment ' THEN SUM([Wage and salaried workers Female % of females employment])

WHEN 'Account ownership at a financial institution or with a mobile-money-service provider, male (% of population ages 15+) ' THEN SUM ([Account ownership at a financial institution or with a mobile-money-service provider, male (% of population ages 15+)])

WHEN 'Wage and salary workers Male % of male employment ' THEN SUM([Wage and salary workers Male % of male employment])

WHEN 'Life expectancy at birth Male years 2021' THEN SUM([Life expectancy at birth Male years])

END

CHAPTER-6

RESULTS AND INTERPRETATIONS

VISUALIZE AND ANALYZE THE DATA

In Tableau, visualization is a process of transforming raw data into interactive and insightful visual representations that facilitate data exploration, analysis, and communication. Tableau offers a wide range of visualization options, including charts, graphs, maps, and dashboards, allowing users to create dynamic and engaging visualizations tailored to their specific data and analysis goals. In addition to individual visualizations, Tableau allows users to combine multiple visualizations into interactive dashboards, providing a comprehensive view of their data and enabling stakeholders to gain deeper insights at a glance. Tableau dashboards can be customized with filters, parameters, and actions to enhance interactivity and facilitate exploration.

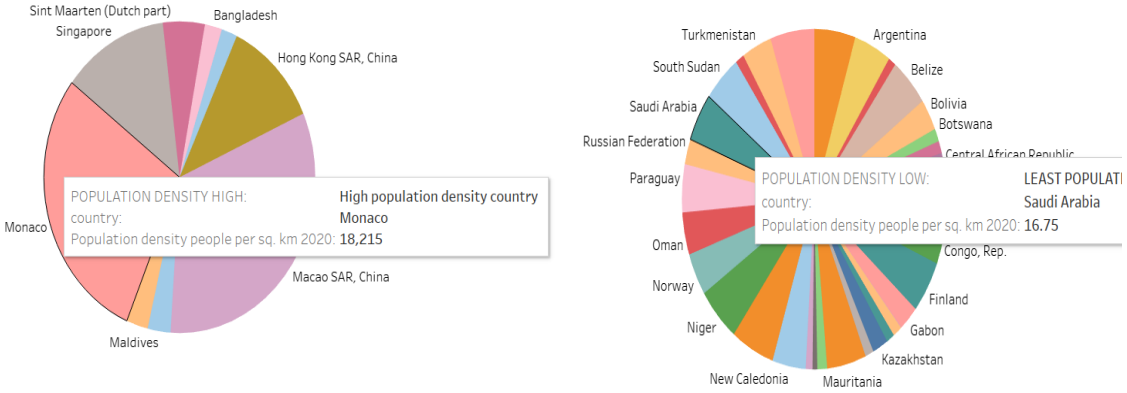


Figure 1 : High and low population density countries

INTERPRETATIONS

By creating calculated field high and low population density countries are visualized.Visualizing population, GDP, GNI, and surface area allows for comparative analysis between countries or regions. By plotting these indicators on charts or maps, users can quickly identify disparities and similarities in economic size, demographic composition, and geographical distribution.

- China has high population density rate,followed by monoco,bangladesh.
- least population density countries include nambia,oman,finland etc

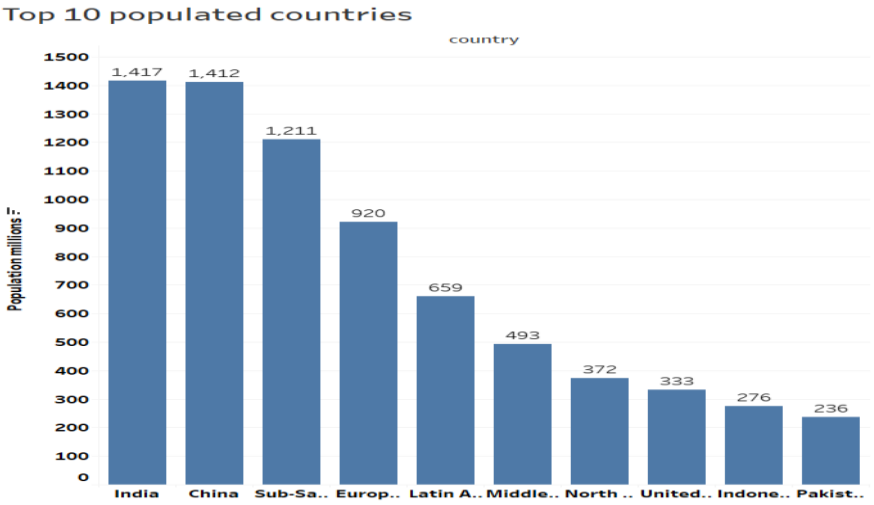


Figure 2 :population of countries

INTERPRETATIONS

Top 10 populated countries are visualized by bar graphs by creating set from populated countries.

India is the most populated country followed by china, and pakistan,USA,Indonesia

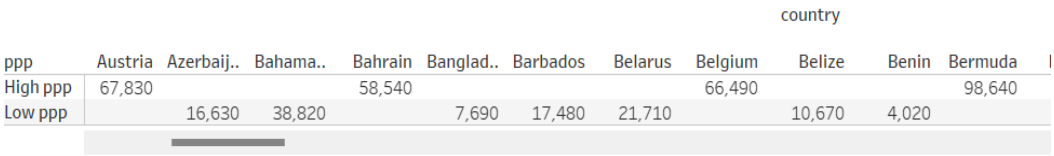


Figure 3:Purchasing power parity gross

By creating calculated value countries with high and low purchasing power parity is visualized by using a certain value.

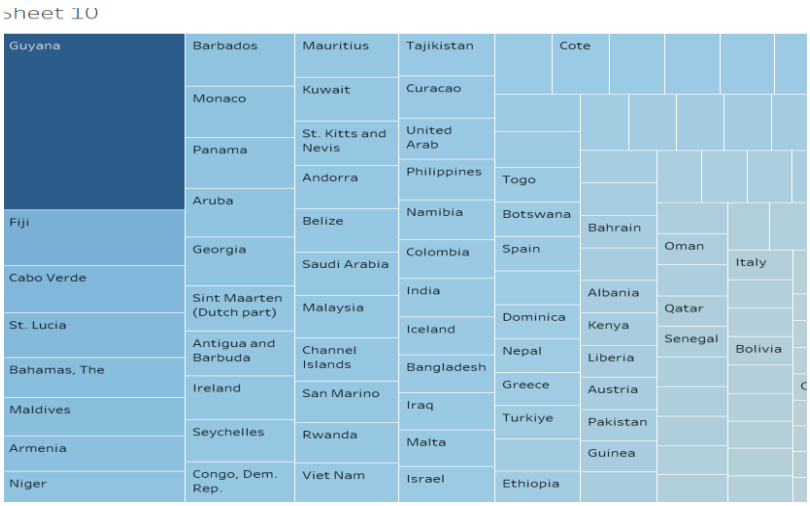


Figure 4:GDP of countries

Gross Domestic Product (GDP) serves as a fundamental measure of a country's economic output and performance, providing valuable insights into economic activity, growth trends, and policy implications.

Top Countries with high GDP and their gross national income is compared

Top 10 GDP

country	Gross domestic product % growth 2022	Gross national income, Atlas method $ billions 2022
Guyana	63.37	12.07
Fiji	20.02	5.01
Cabo Verde	17.12	2.34
St. Lucia	15.88	2.23
Bahamas, The	14.37	12.92
Maldives	13.91	5.70
Armenia	12.60	16.57
Niger	11.49	15.14
Barbados	11.33	5.49

Figure 5: GDP and GNI

Regions surface area is visualized.By selecting the filter value top countries with surface area is selected and created a bar chart and average values and constant value is finded.

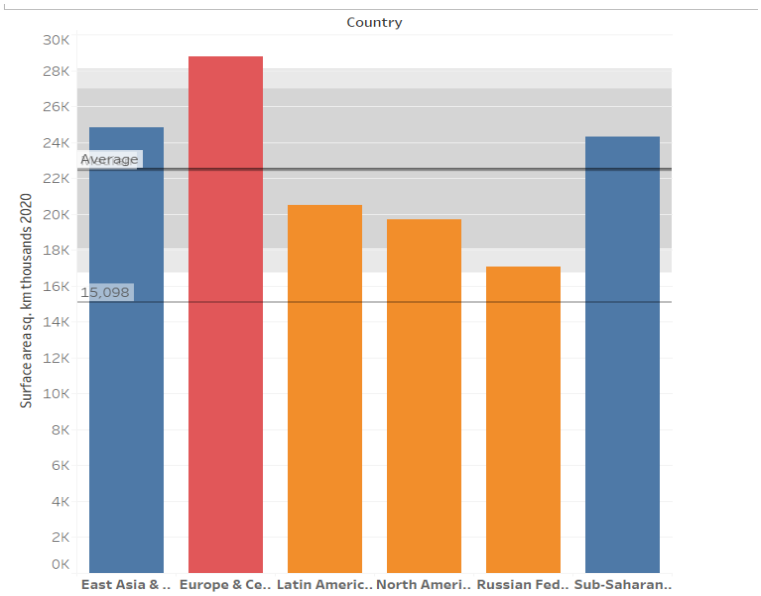


Figure 6: Regions and surface area

INTERPRETATIONS

Europe and central asia have highest surface area. Surface area measurements play a role in climate studies and weather modeling by providing inputs for climate models and simulation

Poverty rates provide insight into socio-economic disparities within a population. By determining the percentage of people living below the poverty line, governments and organizations can identify vulnerable groups and target interventions to address their specific needs. Finding poverty rates and assessing mortality due to malnutrition are essential for understanding and addressing the root causes of poverty, hunger, and poor health outcomes.

International poverty lines Population below $2.15 a day % and Labor productivity GDP per person employed % growth is visualized using tree map.

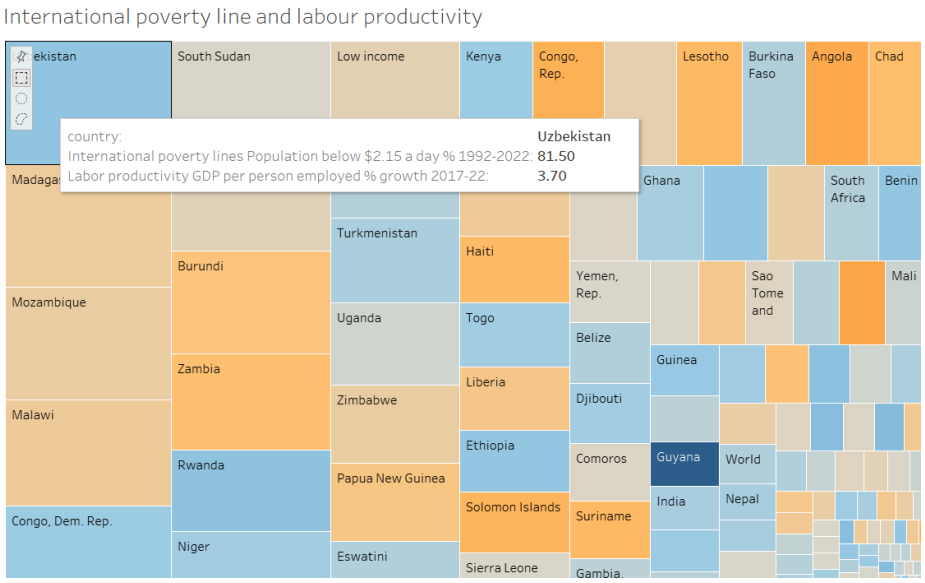


Figure 7:Poverty Population

Figure 8:Mortality caused by road accident

Low mortality rates from road accidents suggest that effective road safety measures are in place, such as well-maintained infrastructure, traffic management systems, and enforcement of traffic laws.

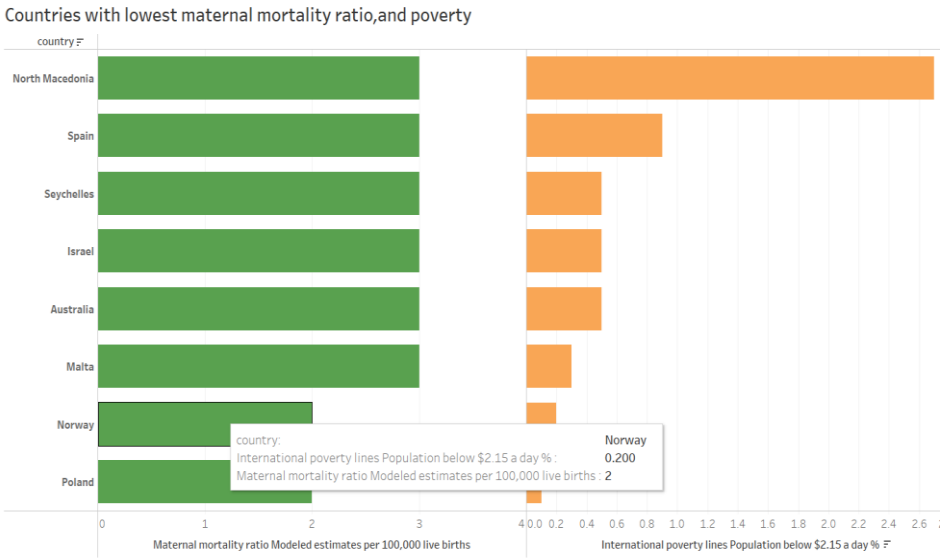


Figure 9 :Lowest maternal mortality & poverty rate

Low maternal mortality rate countries have low poverty rate from the visualization and norway,poland have lowest maternal mortality rate.

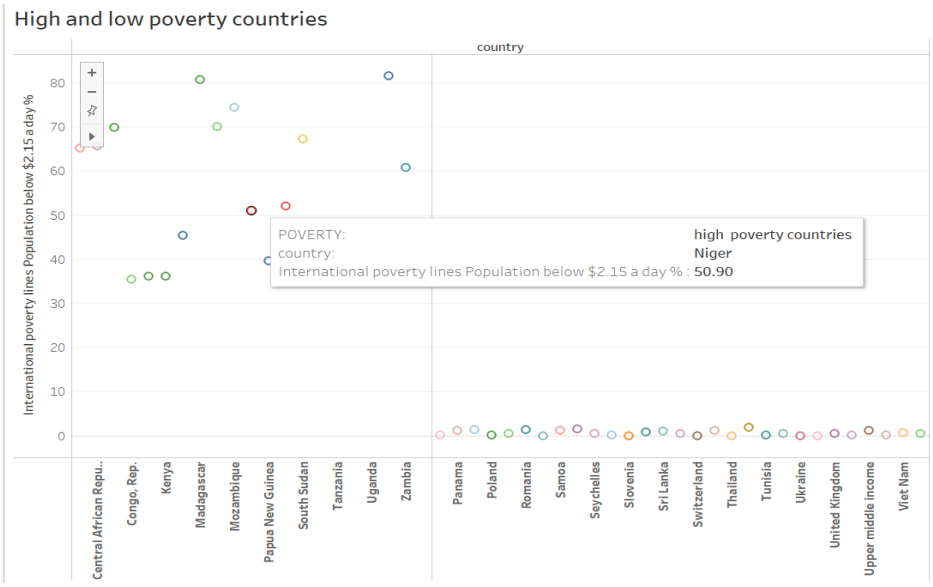


Figure 10:High and low poverty rate

By creating calculated field high and low poverty rate countries are visualized.

Countries like,vietnam,ukraine,poland are low povert countries.These datas are grouped as high and low povert rate countries.

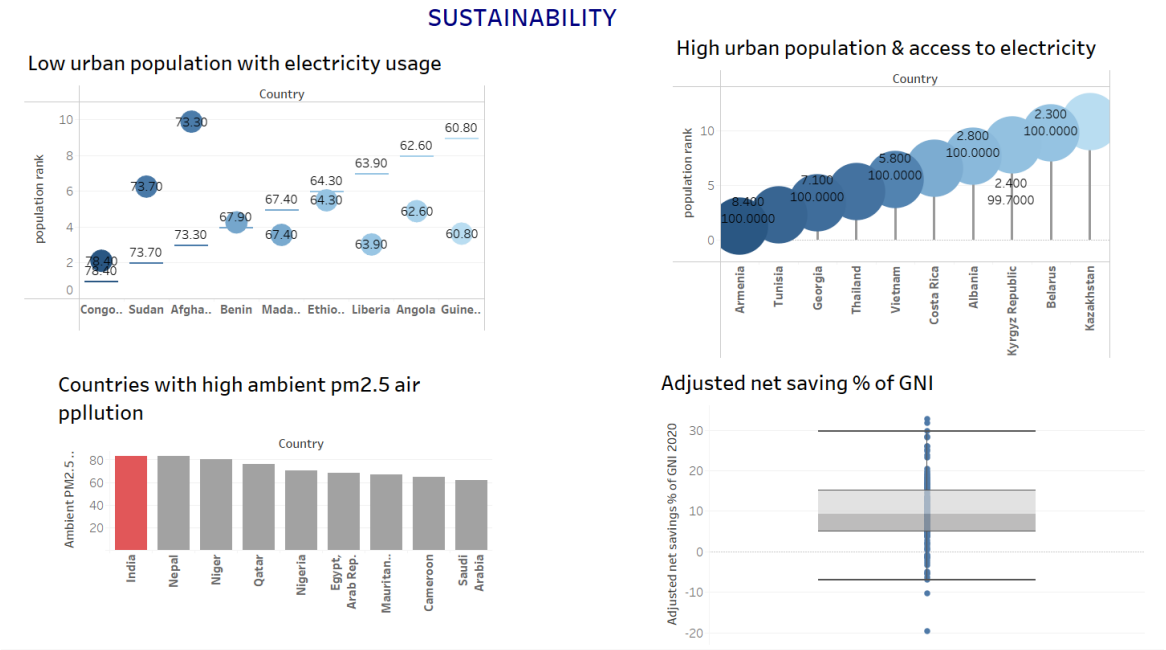


Figure 11:Dashboard of sustainability

INTERPRETATIONS

Sustainability visualization plays a critical role in promoting sustainability literacy, facilitating evidence-based decision-making, and catalyzing collective action towards a more sustainable and resilient future for people and the planet.

Low and high urban population of the country is visualized by using set.Also the access to electricity is also compared.It is visualized by creating lolipop chart and giant with pie.Box plot for adjusted net saving of different countries also visualized.

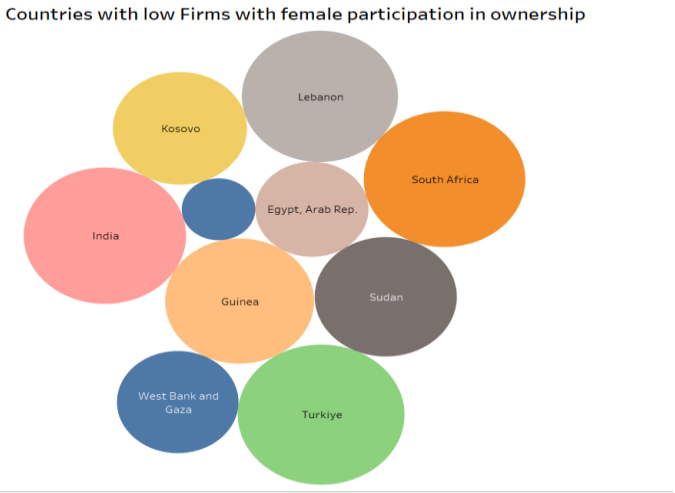


Figure 12 : Countries with low firms with female participation

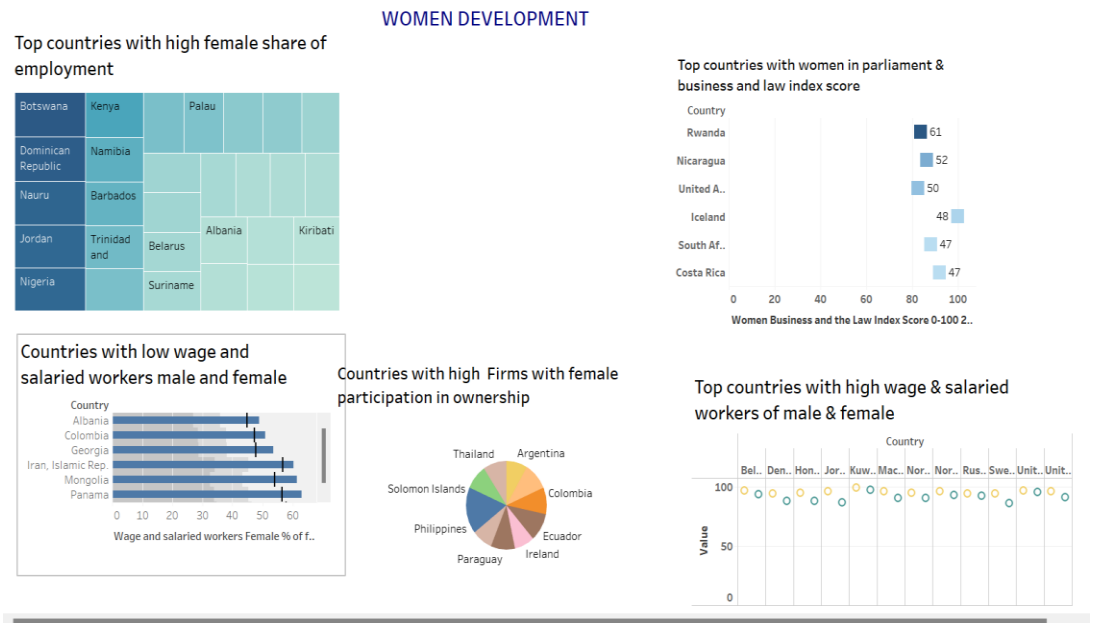


Figure 13:Women development

INTERPRETATIONS

- Countries with low and high firms with female participation is visualized using bubble chart and pie chart
- Top countries with high female share of employment is visualizes using tree map,Bostwana is on top
- Countries with high and low wage and salaried workers is visualized with shape and bullet chart.
- Visulaized the top countries with highest number of women in parliament and their law index
- By examining these indicators collectively, we gain insights into the progress and challenges in achieving gender equality and can better understand the areas that require targeted interventions and support.

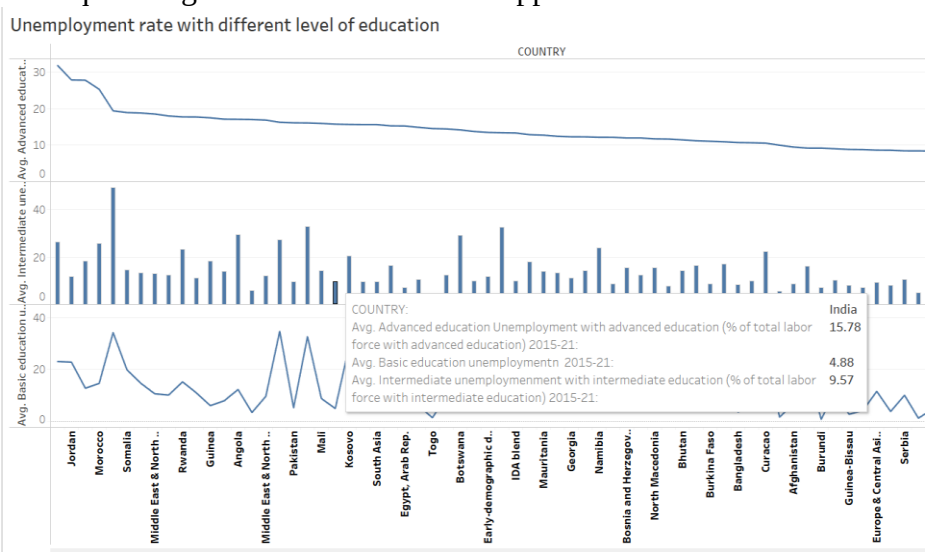


Figure 14:Unemployment rate

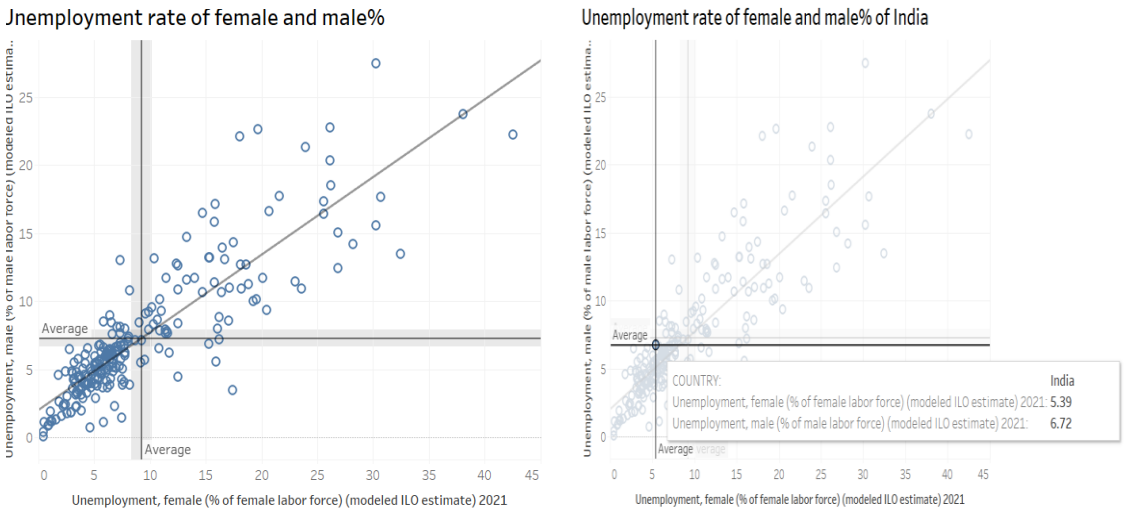


Figure 15 : Unemployment rate of male and female

INTERPRETATIONS

- Unemployment rate of different countries with different levels of education like basic level,intermediate level and advanced level is visualized and analyzed using line graph and bar graph.
- Also female and male employment rate of different countries also compared using scatter plot
- With highlighting option unemployment of india is visualized.
- A graph showing unemployment rates by education level typically highlights the critical role of education in the labor market.It underscores the importance of educational attainment for individual economic stability and informs policymakers about where to focus efforts to reduce unemployment and address skill gaps.

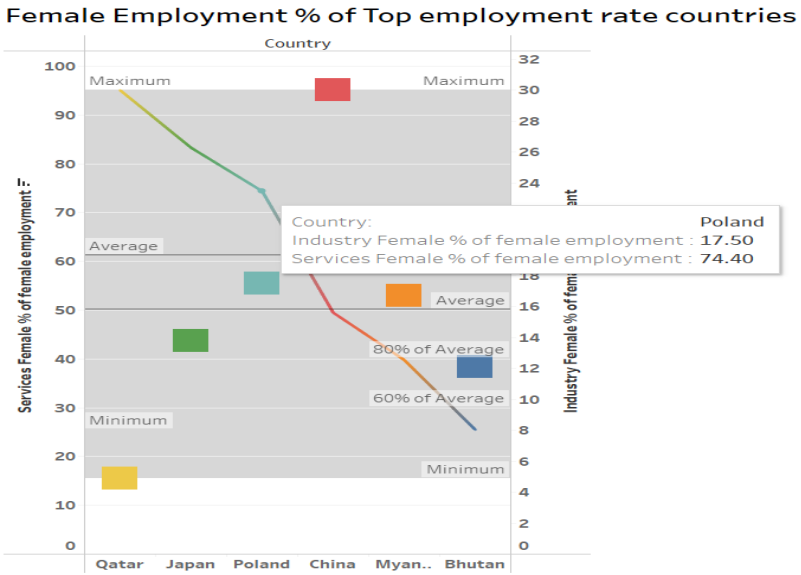


Figure16:Countries with highest female employment in sector

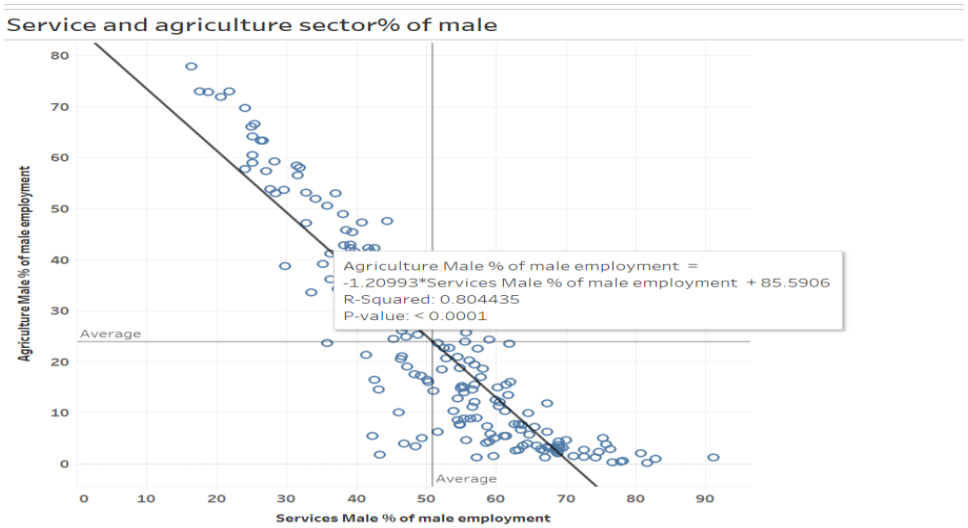


Figure 17: Male employment % in sectors

INTERPRETATIONS

- Female employment % of top employment rate countries.In service and industrial sectors women's employment rate is compared and it is analysed, average values,minimum,maximum also finded and visualized.
- Male employment rate of agriculture sector and service sector is visualized in the scatter plot.Trend line is used here.
- By examining employment rates across different sectors, we can identify gender disparities in the workforce. This helps to highlight sectors where one gender is significantly underrepresented.

RELATIONSHIP BETWEEN THE INDICATORS

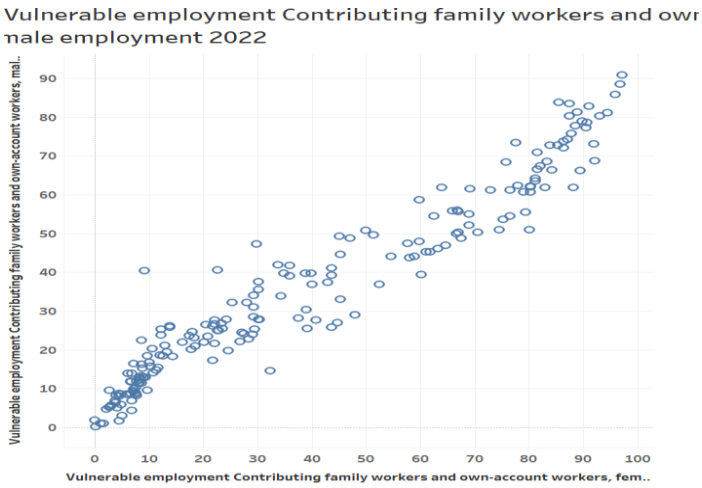


Figure 18 :Vulnerable employment

INTERPRETATIONS

Vulnerable employment Contributing family workers and own-account workers, female % of female and male employment is compared with scatter plot and they show highly correlated,also set created by selecting the points to know the countries with high correlation.

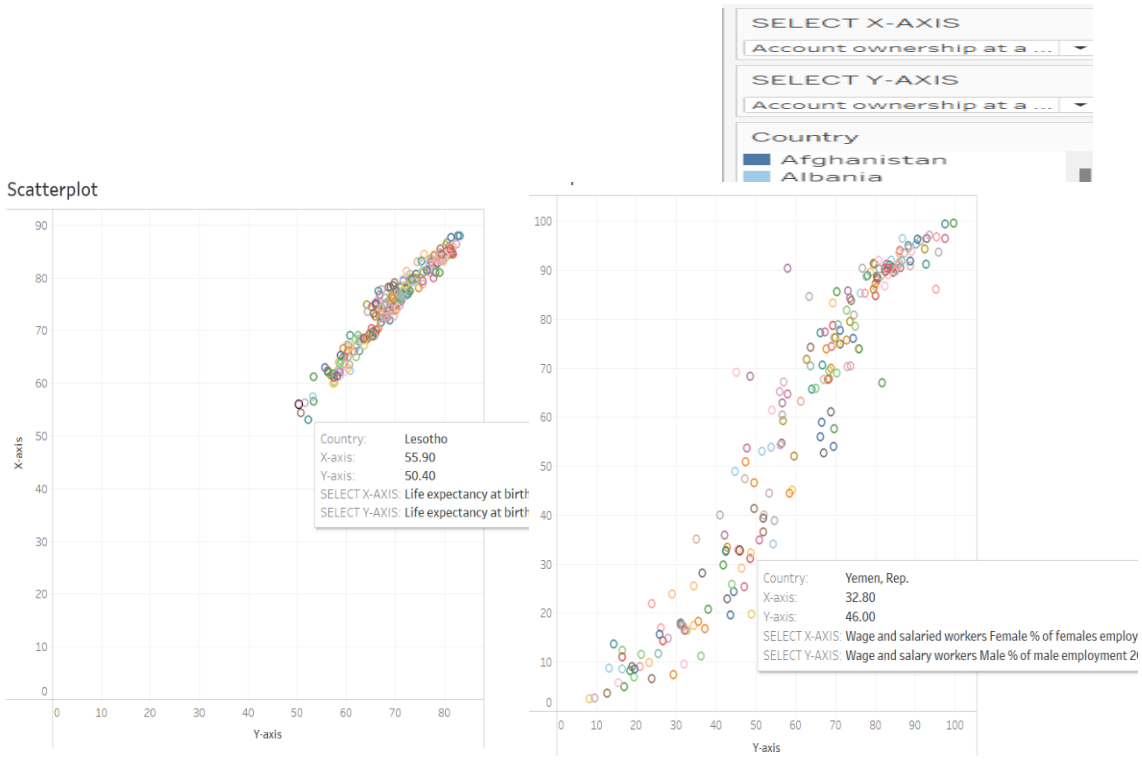


Figure 19:Scatter plot with parameter

INTERPRETATIONS

- Parameter and calculated field is created to compare indicators in a single scatter plot by selecting x and y axis
- 'Account ownership at a financial institution or with a mobile-money-service provider, female (% of population ages 15+)&'Account ownership at a financial institution or with a mobile-money-service provider, male (% of population ages 15+)
- 'Life expectancy at birth Female and male years '
- 'Wage and salaried workers male % of males and females employment '
- These terms have direct correlation

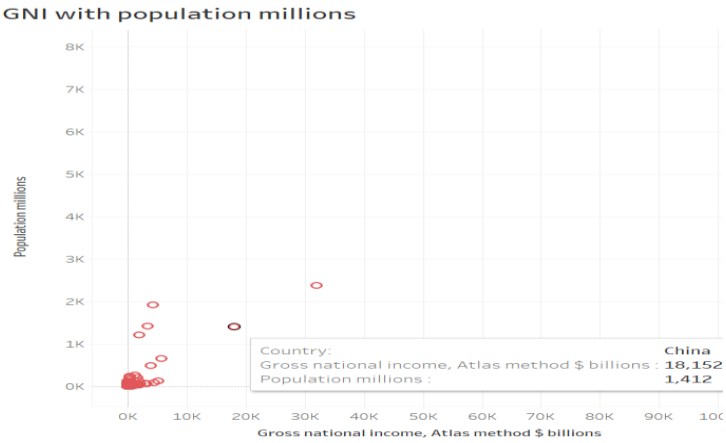


Figure 20:GNI VS Population million

INTERPRETATIONS

Population and GNI are closely intertwined in the context of economic development and societal progress. Analyzing their relationship can provide insights into the dynamics of population growth, income distribution, and socioeconomic development within countries and regions. Higher population density might indicate higher levels of economic activity and potentially higher GNI per capita if resources are efficiently utilized.

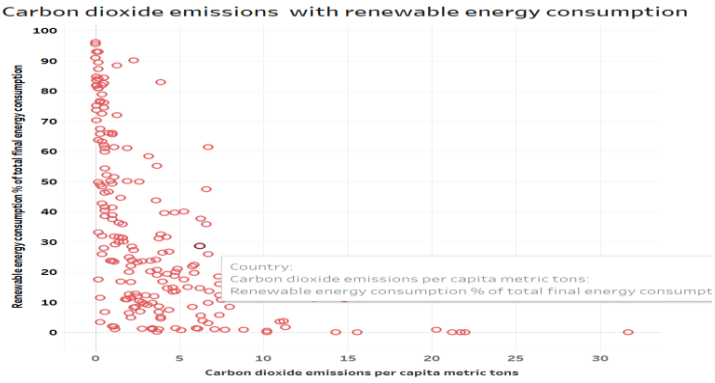


Figure 21: CO2 and renewable energy

INTERPRETATIONS

Some countries with higher renewable energy consumption may have lower CO2 emissions per capita, contributing to environmental sustainability and potentially impacting health outcomes.

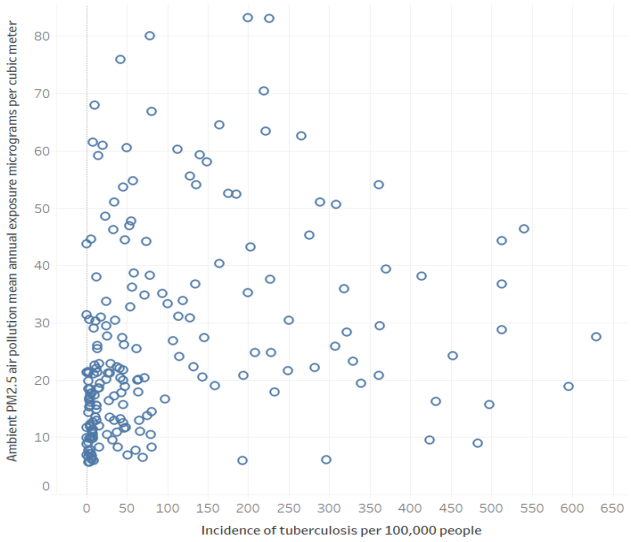


Figure 22 : Tuberculosis with air pollution

INTERPRETATIONS

Air pollution, including particulate matter such as PM2.5, has been associated with an increased risk of tuberculosis (TB), particularly in areas with high levels of pollution and high TB burden. While air pollution itself does not directly cause TB, it can contribute to conditions that facilitate the transmission of TB and exacerbate the risk of TB infection and disease progression.

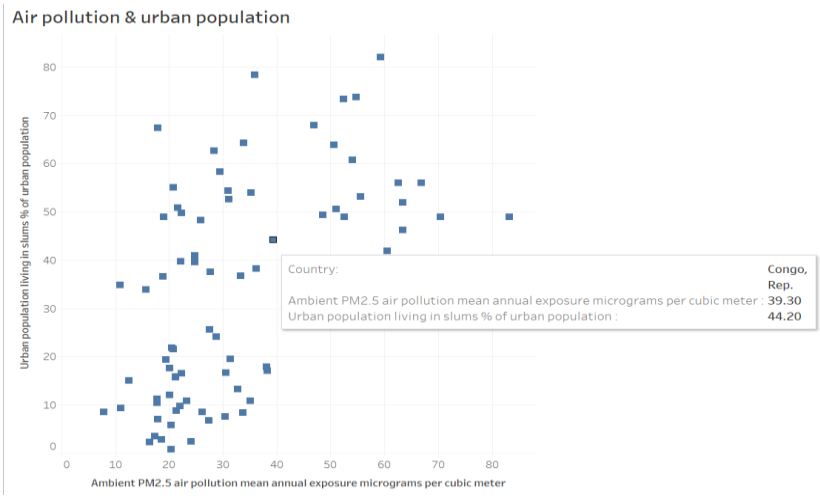


Figure 23:Urban population with air pollution

INTERPRETATIONS

The concentration of people in urban settings leads to increased energy consumption, transportation activities, industrial operations, and waste generation, all of which can contribute to higher levels of air pollution. Overall, the relationship between urban population and air pollution is complex and multifaceted

CONCLUSION

In conclusion, project aimed to leverage the power of data visualization to gain insights into global development trends using the Worldview dataset. Through the analysis and visualization of key indicators, we were able to uncover valuable insights and trends that have implications for global development efforts.By leveraging Tableau's capabilities, stakeholders can gain insights into complex economic, social, and environmental issues, facilitating informed decision-making and targeted interventions to address global challenges.Visualizations depicting the size of the economy, such as GDP growth rates, GDP per capita, and income distribution, have highlighted the economic progress achieved by different countries and regions over time. These insights underscore the importance of fostering economic growth and improving living standards to enhance overall well-being.The visualizations tracking progress towards ending poverty and improving well-being have revealed both successes and ongoing challenges in achieving global development goals. By analyzing indicators such as poverty rates, access to education, healthcare, and basic services, stakeholders can identify areas where targeted interventions are needed to address disparities and promote inclusive development.

Visualizations related to promoting sustainability have shed light on environmental conservation efforts, renewable energy adoption, carbon emissions, and natural resource management.These insights highlight the urgency of addressing climate change and promoting sustainable practices to safeguard the planet for future generations.The visualizations focusing on women's development have illuminated gender disparities in education, workforce participation, political representation, healthcare access, and income equality. By addressing these disparities and promoting gender equality, stakeholders can unlock the full potential of women and girls as drivers of social and economic progress.

So the data visualizations presented serve as powerful tools for informing decision-making, driving policy change, and mobilizing collective action to build a more sustainable, equitable, and prosperous world for all. By harnessing the power of data and leveraging innovative technologies like Tableau, we can chart a course towards a brighter future for generations to come.

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