Task 1: Power Bi Dashboard design

Title: Interactive Dashboard Design (Power Bi)

Topic: Global Population Estimates & Projections on Urban and Rural Economic Divide

Dataset: Populations Dynamics

1.1 Introduction

The urban-rural population gap between 1960 and 2050 is the main subject of this report's analysis of global population dynamics. Utilising an NGO dataset, the study incorporates historical data on demographic factors, including the proportion of urban and rural inhabitants, and economic classifications, from 1960 to 2022 with future forecasts from 2023 to 2050. Slicers for Year, Income Group, Region, and Country improve the five sophisticated visuals —donut charts, stacked area charts, maps, clustered bar charts, and hierarchies —integrated into the dynamic Power BI dashboard. These images give planners useful information for long-term planning by illuminating population patterns, regional differences, and the economic split in urbanization.

1.2 Findings of note from my initial exploration of the data.

Urbanization is a significant driver of economic growth and social transformation, expected to accelerate as global populations increasingly migrate to cities (World Bank, 2020). However, this trend also highlights disparities between urban and rural areas. While urbanization often brings economic opportunities, it creates challenges in ensuring equitable access to resources, particularly in rural regions (OECD, 2019). Nearly 90% of the predicted urban population expansion by 2050 is expected to take place in Asia and Africa, regions that are now known for having sizable rural populations. This shift underscores the importance of addressing the unique challenges and opportunities in these regions (UN-Habitat, 2020).

Sustainable urbanization is essential for balancing rapid urban growth with the preservation of rural livelihoods and ecosystems. Managing this balance is critical not only for economic and social stability but also for ensuring long-term environmental sustainability in the face of climate change (International Institute for Environment and Development, 2021). Together, these perspectives provide a comprehensive foundation for analyzing global urbanization trends and their implications for future development.

1.3 Step-By-Step Overview of How The Dashboard Was Built

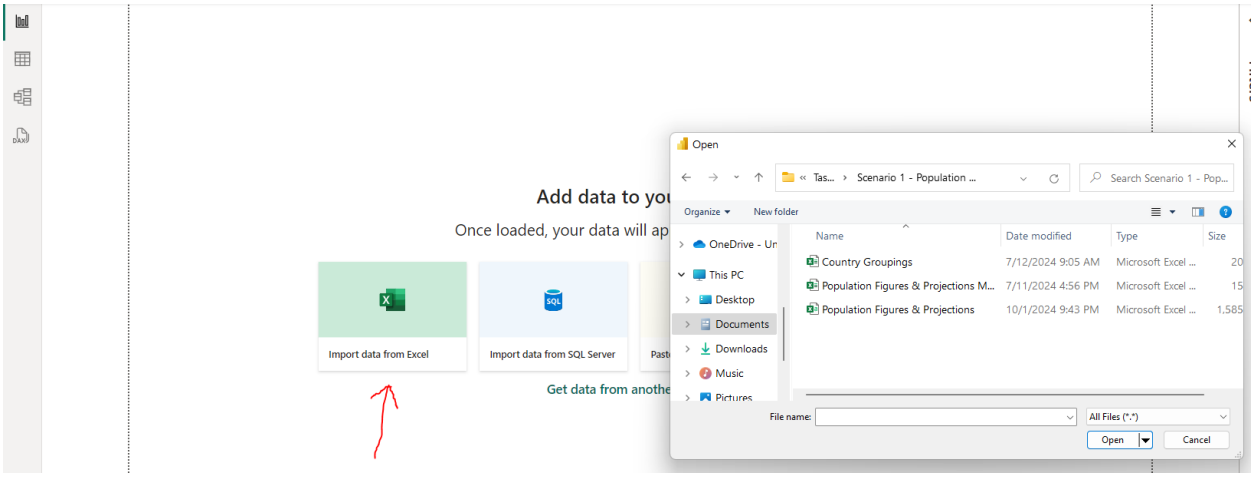
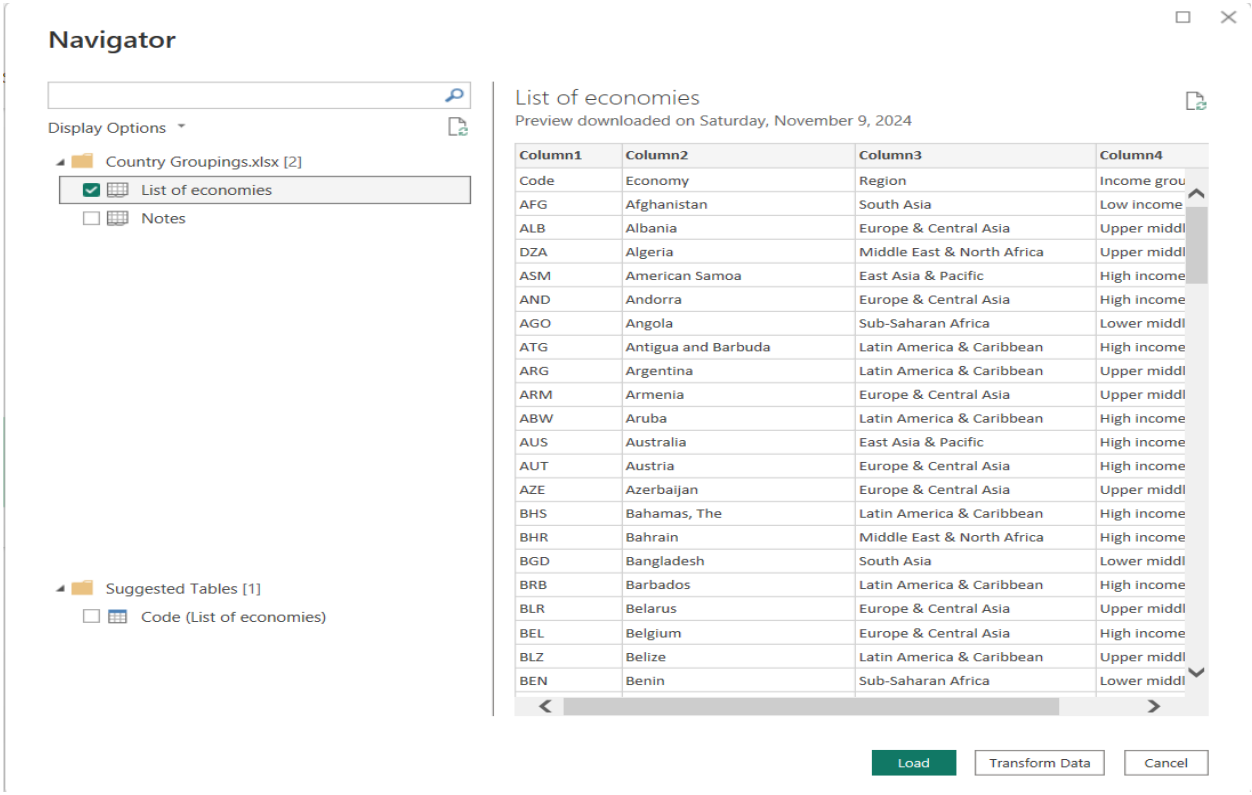


Figure 1.1: The figure above shows how I imported the Country groupings table and the Populations Figure & Projections.



Column1	Column2	Column3	Column4
Code	Economy	Region	Income grou
AFG	Afghanistan	South Asia	Low income
ALB	Albania	Europe & Central Asia	Upper middl
DZA	Algeria	Middle East & North Africa	Upper middl
ASM	American Samoa	East Asia & Pacific	High income
AND	Andorra	Europe & Central Asia	High income
AGO	Angola	Sub-Saharan Africa	Lower middl
ATG	Antigua and Barbuda	Latin America & Caribbean	High income
ARG	Argentina	Latin America & Caribbean	Upper middl
ARM	Armenia	Europe & Central Asia	Upper middl
ABW	Aruba	Latin America & Caribbean	High income
AUS	Australia	East Asia & Pacific	High income
AUT	Austria	Europe & Central Asia	High income
AZE	Azerbaijan	Europe & Central Asia	Upper middl
BHS	Bahamas, The	Latin America & Caribbean	High income
BHR	Bahrain	Middle East & North Africa	High income
BGD	Bangladesh	South Asia	Lower middl
BRB	Barbados	Latin America & Caribbean	High income
BLR	Belarus	Europe & Central Asia	Upper middl
BEL	Belgium	Europe & Central Asia	High income
BLZ	Belize	Latin America & Caribbean	Upper middl
BEN	Benin	Sub-Saharan Africa	Lower middl

Figure 1.2: The figure above shows a sample of how I loaded my data into the power bi environment, and from my observation the column names were not properly identified. So

there are two way I could use to change the names either from the Table view option at the left or the table rack at the right by double clicking on the names.

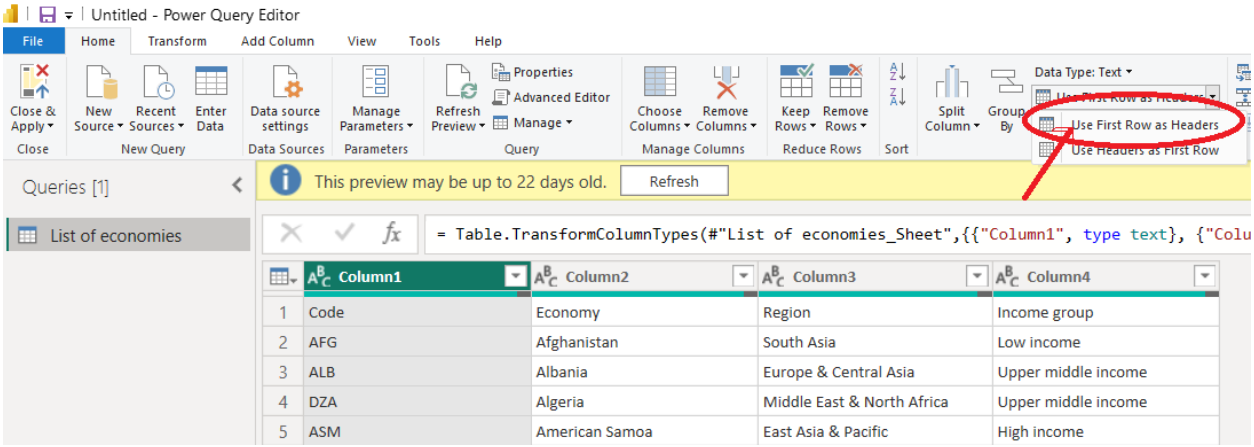


Figure 1.3: The image above shows my attempt to transform immediately the country grouping table in other to "**use First Row as Headers** " highlighted at the right corner of the image.

Figure 1.4: In an attempt to clean the data I observed two (2) null rows at the end of the table which could alter the integrity of merging the two tables needed for this work as the country grouping table seem to have unique Country code.

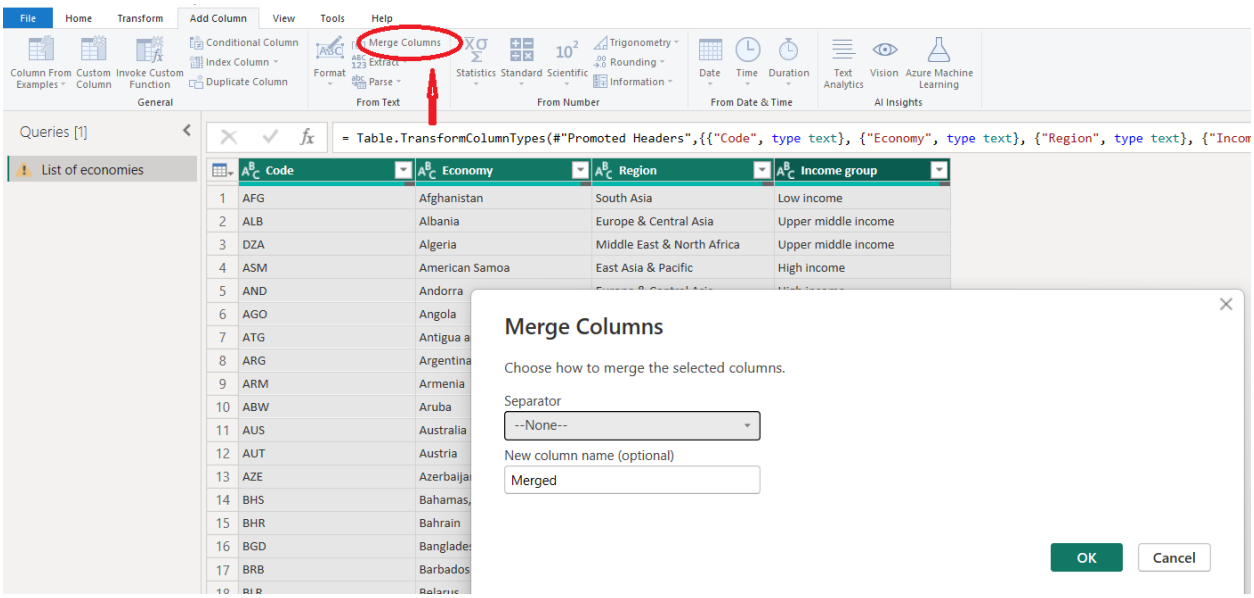


Figure 1.5: In this image I merged the columns to use the merged column to filter out the empty rows

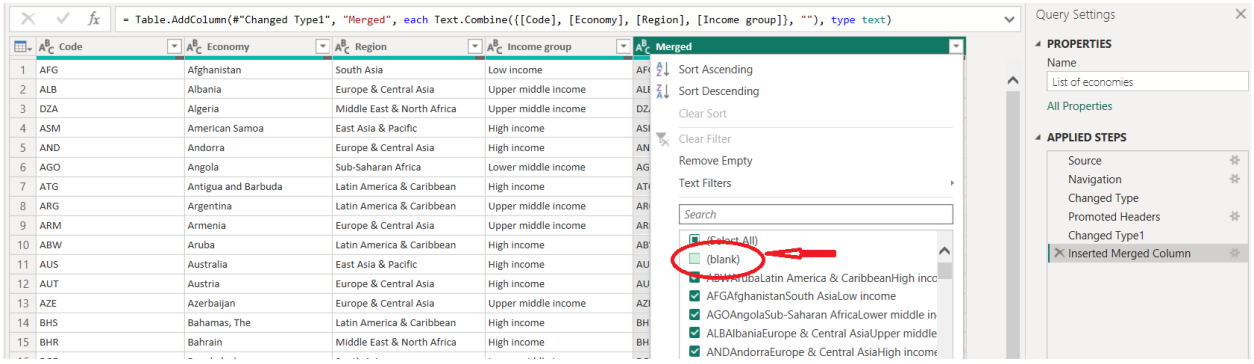


Figure 1.6: In this image I unselect Blank on the newlz created dummz column, to remove empty rows then I deleted the dummy column.

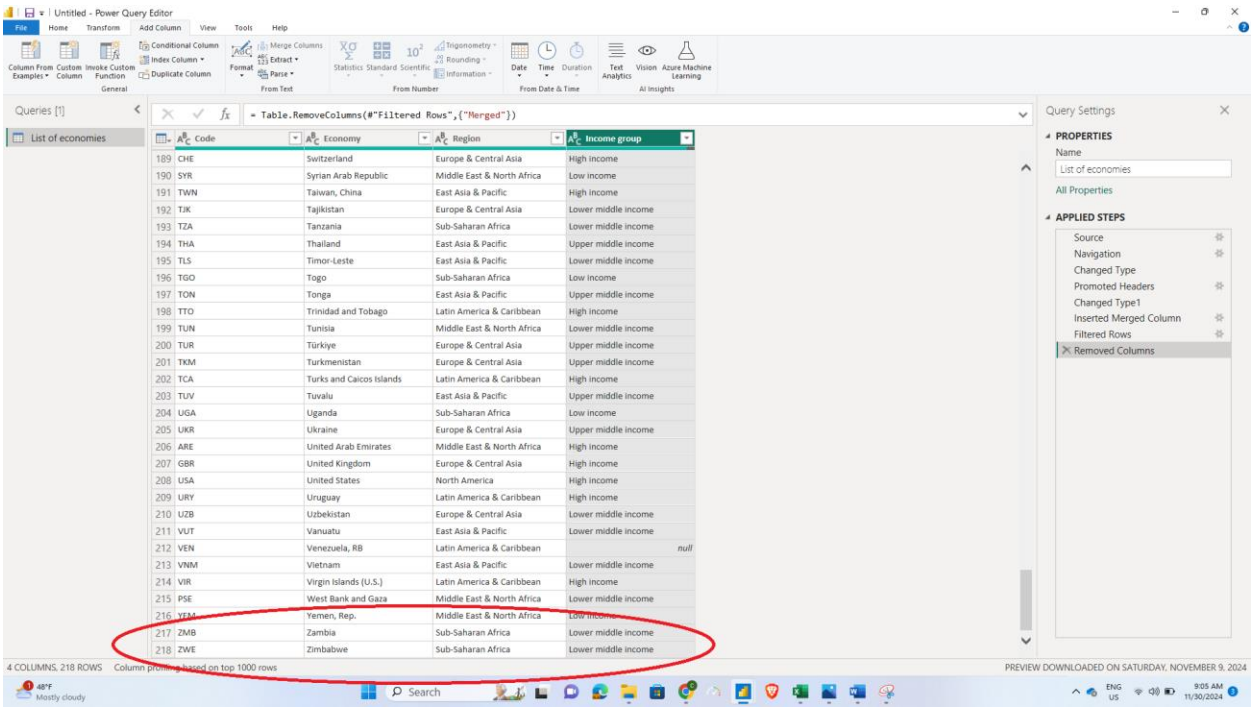
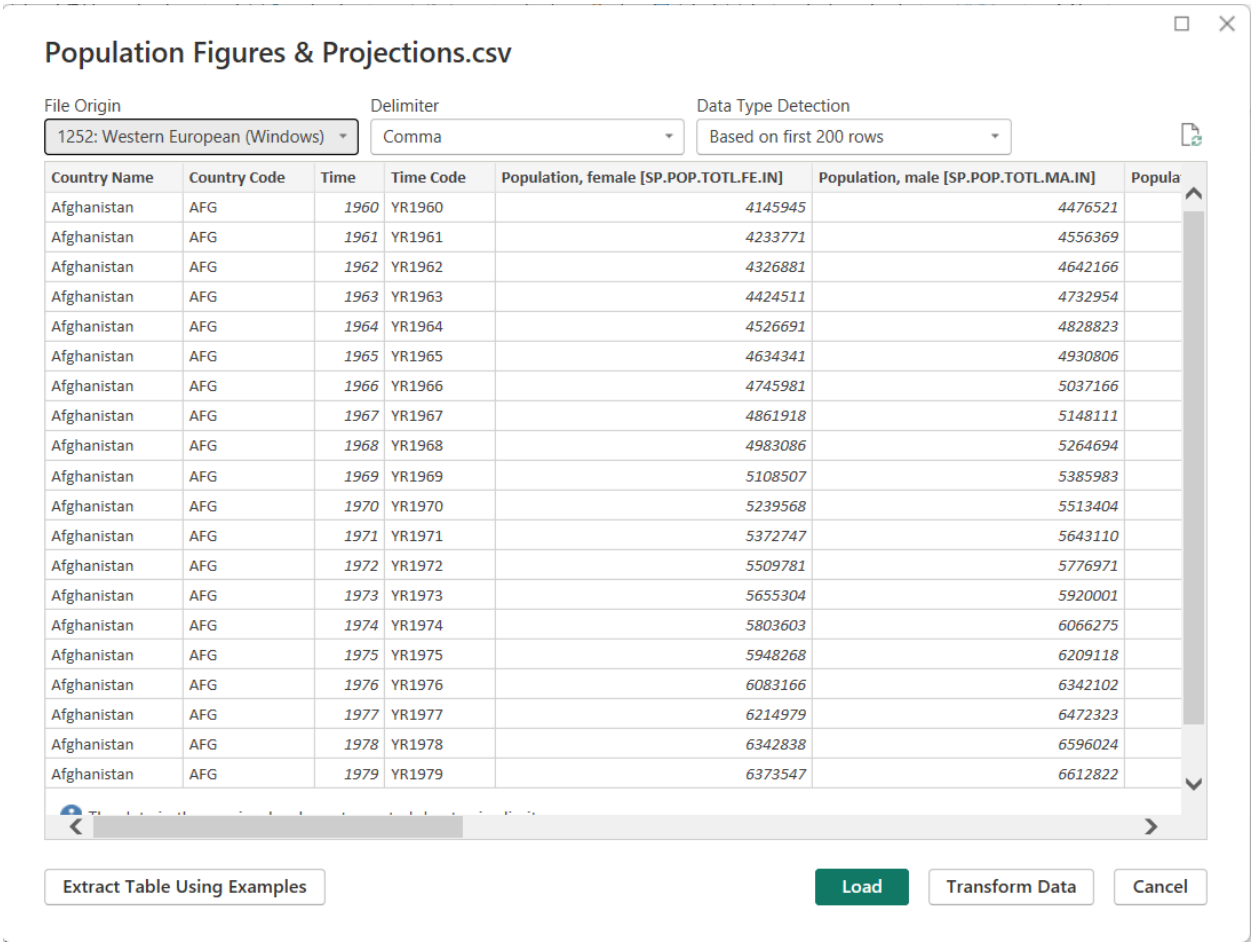
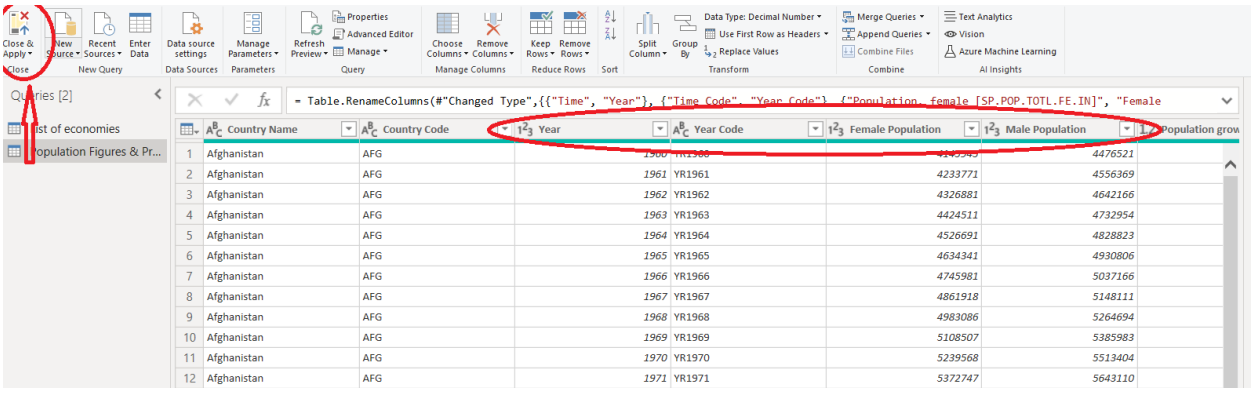


Figure 1.7: Here we have cleaned data, then at the up left corner I apply and close the transformation done so far.



Country Name	Country Code	Time	Time Code	Population, female [SP.POP.TOTL.FE.IN]	Population, male [SP.POP.TOTL.MA.IN]	Popula
Afghanistan	AFG	1960	YR1960	4145945	4476521	
Afghanistan	AFG	1961	YR1961	4233771	4556369	
Afghanistan	AFG	1962	YR1962	4326881	4642166	
Afghanistan	AFG	1963	YR1963	4424511	4732954	
Afghanistan	AFG	1964	YR1964	4526691	4828823	
Afghanistan	AFG	1965	YR1965	4634341	4930806	
Afghanistan	AFG	1966	YR1966	4745981	5037166	
Afghanistan	AFG	1967	YR1967	4861918	5148111	
Afghanistan	AFG	1968	YR1968	4983086	5264694	
Afghanistan	AFG	1969	YR1969	5108507	5385983	
Afghanistan	AFG	1970	YR1970	5239568	5513404	
Afghanistan	AFG	1971	YR1971	5372747	5643110	
Afghanistan	AFG	1972	YR1972	5509781	5776971	
Afghanistan	AFG	1973	YR1973	5655304	5920001	
Afghanistan	AFG	1974	YR1974	5803603	6066275	
Afghanistan	AFG	1975	YR1975	5948268	6209118	
Afghanistan	AFG	1976	YR1976	6083166	6342102	
Afghanistan	AFG	1977	YR1977	6214979	6472323	
Afghanistan	AFG	1978	YR1978	6342838	6596024	
Afghanistan	AFG	1979	YR1979	6373547	6612822	

Figure 1.8: The image above shows my attempt to immediately transform the Populations Figures & Projections.csv.



	Country Name	Country Code	Year	Year Code	Female Population	Male Population
1	Afghanistan	AFG	1960	YR1960	4145945	4476521
2	Afghanistan	AFG	1961	YR1961	4233771	4556369
3	Afghanistan	AFG	1962	YR1962	4326881	4642166
4	Afghanistan	AFG	1963	YR1963	4424511	4732954
5	Afghanistan	AFG	1964	YR1964	4526691	4828823
6	Afghanistan	AFG	1965	YR1965	4634341	4930806
7	Afghanistan	AFG	1966	YR1966	4745981	5037166
8	Afghanistan	AFG	1967	YR1967	4861918	5148111
9	Afghanistan	AFG	1968	YR1968	4983086	5264694
10	Afghanistan	AFG	1969	YR1969	5108507	5385983
11	Afghanistan	AFG	1970	YR1970	5239568	5513404
12	Afghanistan	AFG	1971	YR1971	5372747	5643110

Figure 1.9: Some of the column names I edited was Time column to Year, Female Population, Male Populations, this was done by double clicking on the names etc.

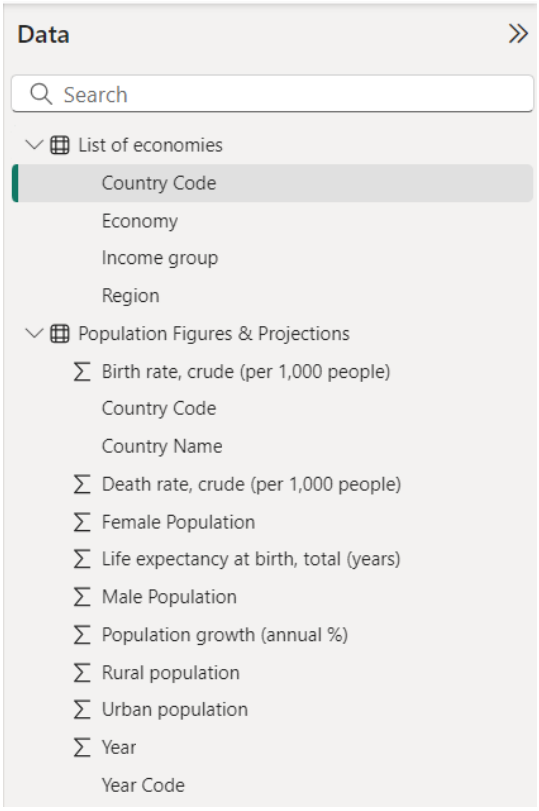


Figure 1.10: Here is my cleaned and ready datasets named (List of economies) and (Population Figures Projections)

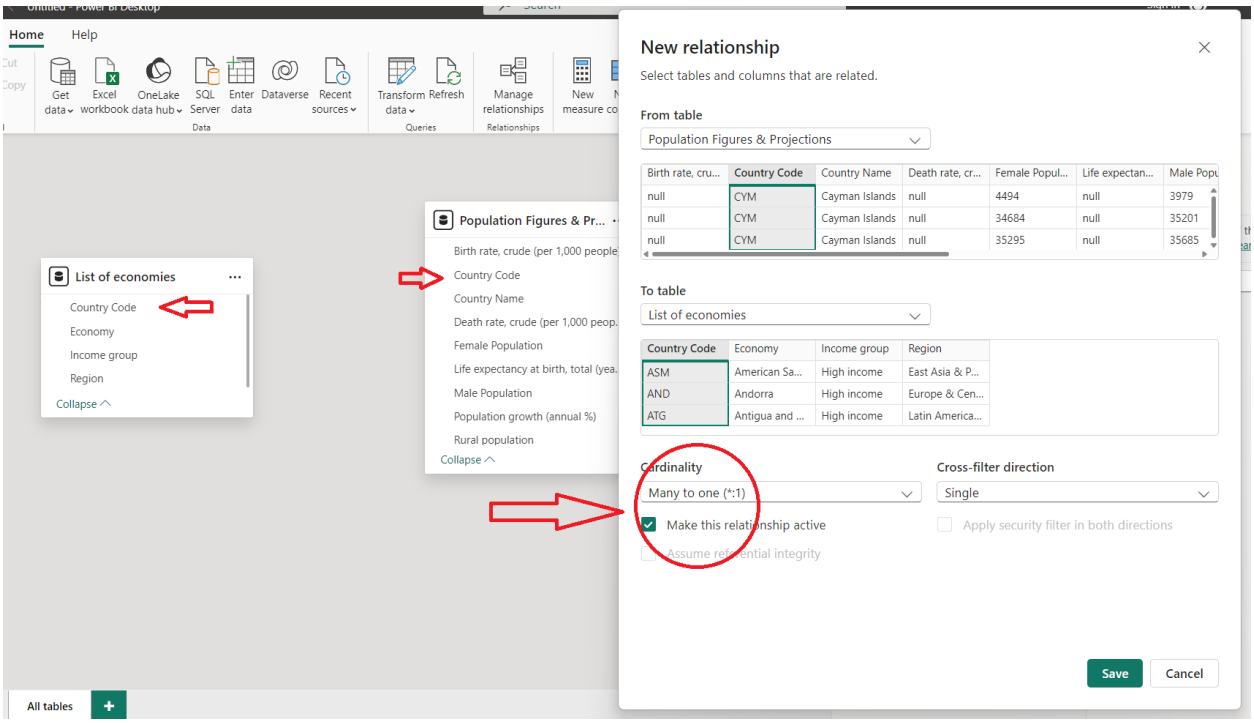


Figure 1.11: Next on the image is my Model view, were I joined both tables with the Country code on both tables, this gave me a Many to one Cardinality as an outcome of removing the two empty rows from the List of economies table.

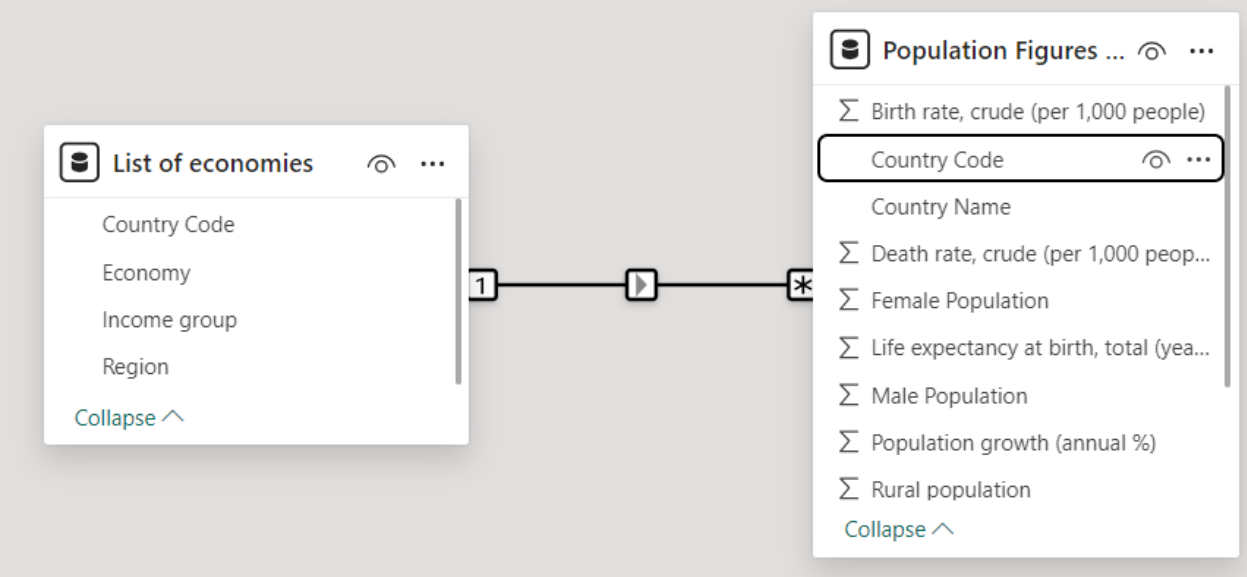


Figure 1.12: This image shows my successfully linked tables and ready for visualization.

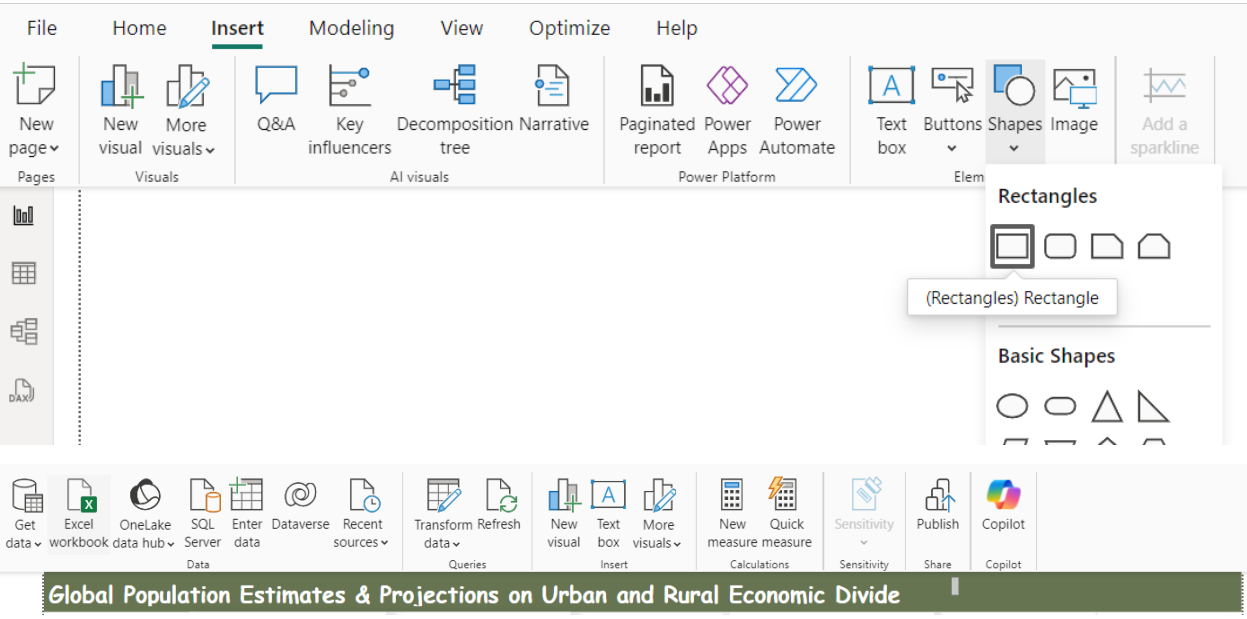


Figure 1.13: On the image above I created a header using a rectangle shape by going to insert on the power bi ribbon and, selecting rectangle, stretching it to the desired size and then I **Styled** it to my desired colour under **Format shape** by the right. Also, I placed a text on it by

going to **the Text box** under **Home** after typing my topic, I set it to white, and then sent my rectangular shape backward**.**

1.4 Created Measure Implemented on my Dashboard

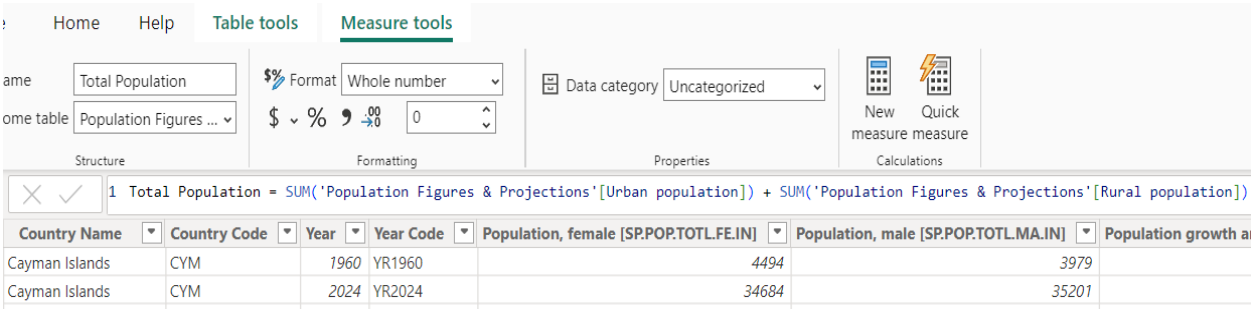


Figure 1.14: To provide a thorough perspective of the entire population for analysis and dashboard visualization, the measure Total Population computes the sum of the urban and rural populations.

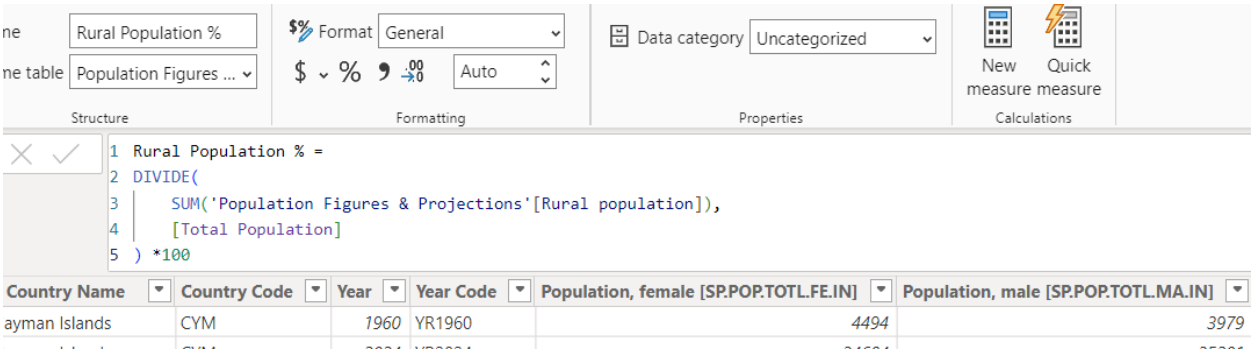


Figure 1.15: To ascertain the proportion of individuals residing in rural regions, the measure divides the rural proportion by the total population, then multiply the result by 100 to get the rural people percentage.

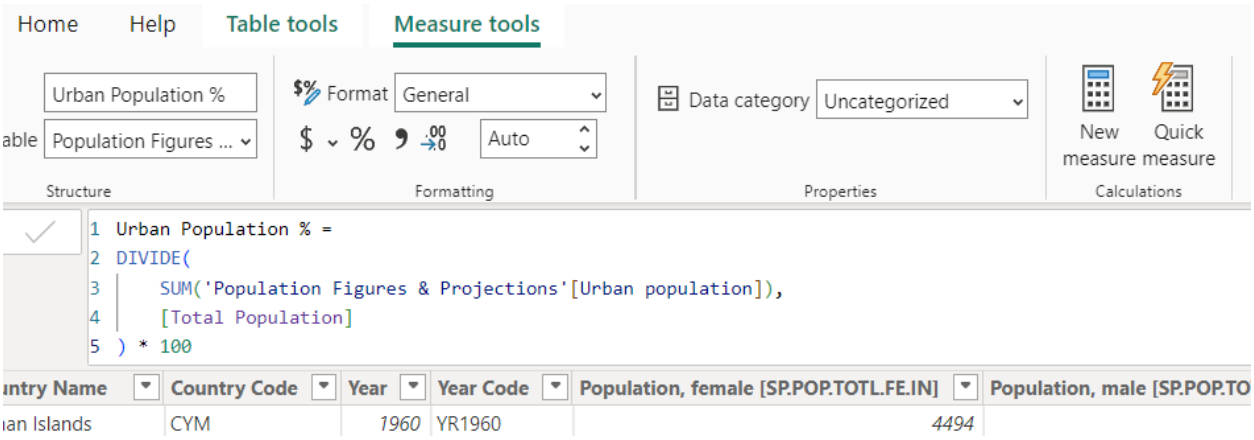


Figure 1.16: To ascertain the proportion of individuals residing in urban regions, the measure divides the urban proportion by the total population, then multiply the result by 100 to get the urban people percentage.

```
1 Average population = (SUM('Population Figures & Projections'[Rural population]) + SUM('Population Figures & Projections'[Urban
  population]))/DISTINCTCOUNT('Population Figures & Projections'[Year])
```

Figure 1.17: The average population measure help filter total population of urban and rural, by distinct years.

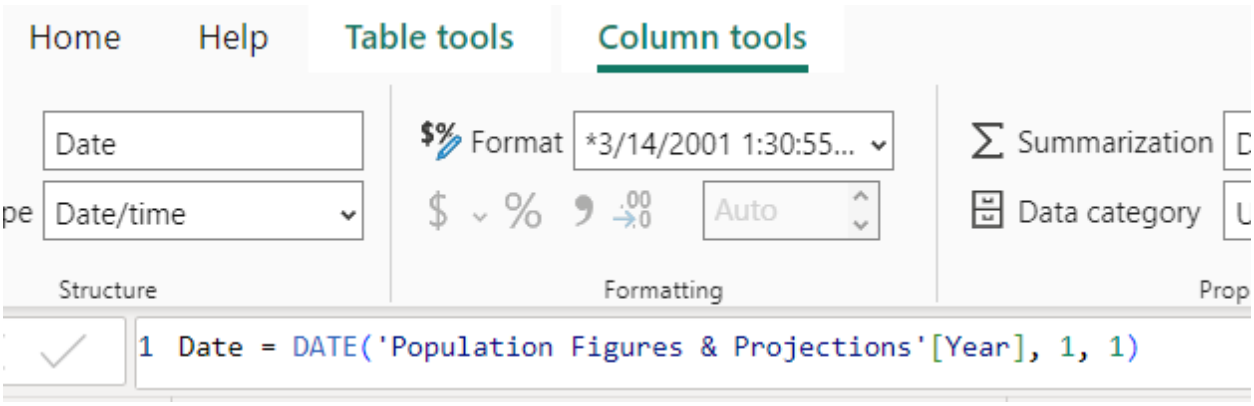


Figure 1.18: The computed column Date above sets the Year to January 1 of the designated year, converting it from an integer to a full date format. This makes Power BI's time intelligence features possible.

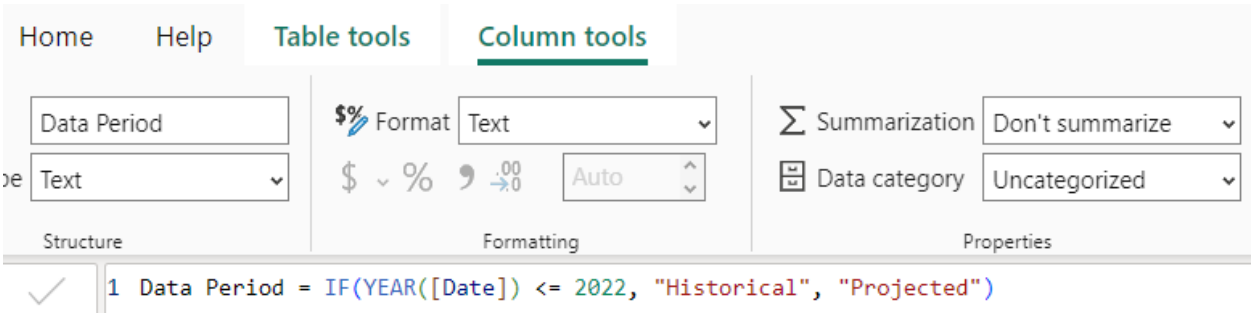


Figure 1.19: This measure above If the year from the Date column is 2022 or sooner, the data period classifies the data as (**Historical**) if not, it identifies the data as (**Projected**) for subsequent years.

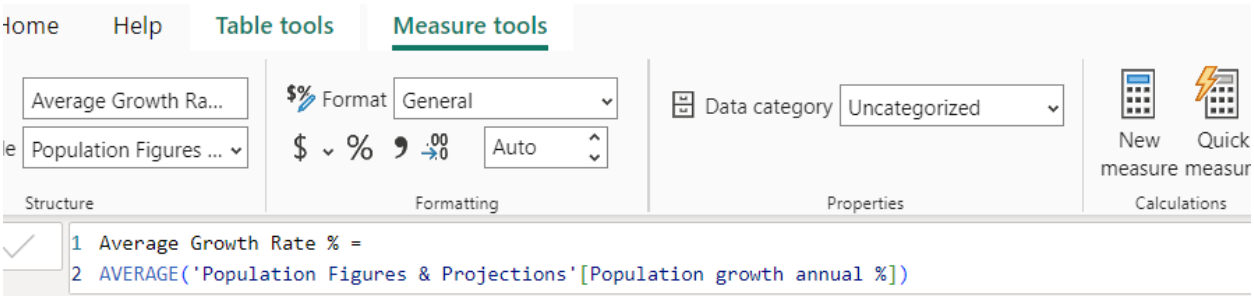
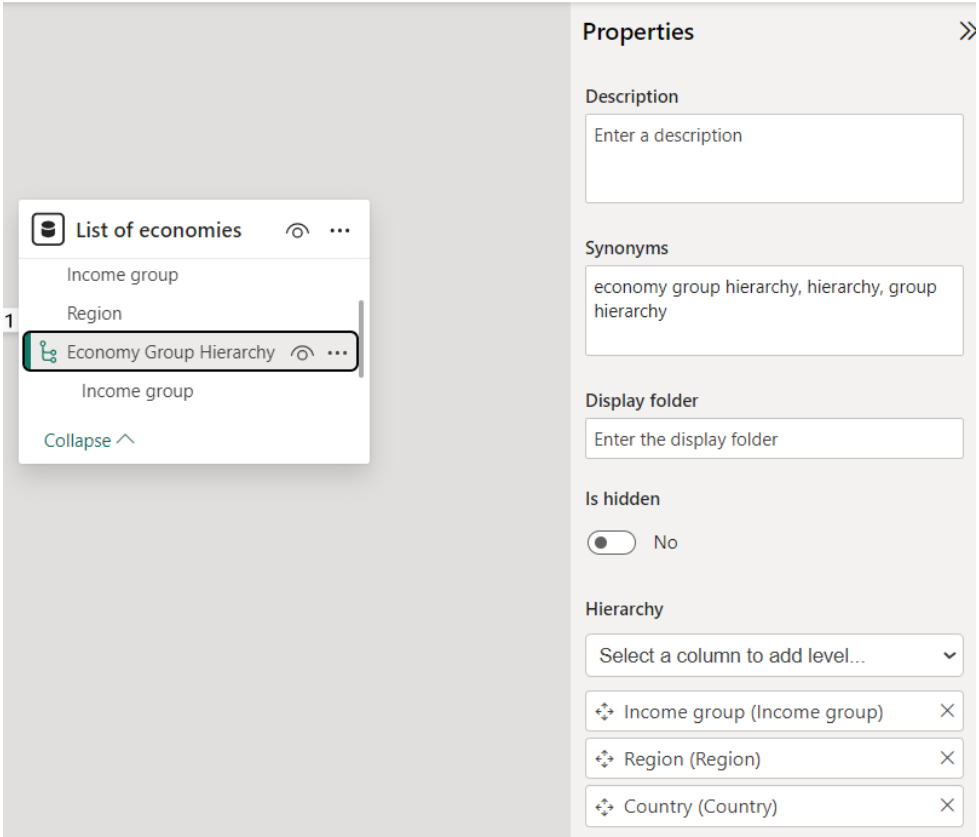


Figure 1.20: By combining values from the Population growth annual % column, the Average Growth Rate % measure determines the annual population growth rate average and offers information on general population growth trends throughout time.

1.5 Creating Hierarchy for my Dashboard



Economy Group Hierarchy:

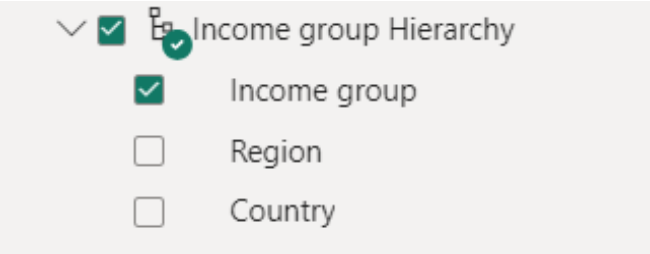


Figure 1.21: The Function of the Economy Group Hierarchy: The hierarchy allows for in-depth examination of urban-rural population patterns and trends by facilitating analysis across income groups, regions, and nations.

Figure 1.22: The Image above displays the measure I have created. From the left hand I have total population figure of "**588 billion**", within the year 1960 to 2022, and the projected years 2023 to 2050 and the next is the measure showing that **53.09%** are urban global population while **46.91%** are rural population.

Figure 1.23: From the left above, it displays average growth rate of economy, the next shows current year total population as year on year. Finally Average population helps view unique populations per distinct year.

Slicers

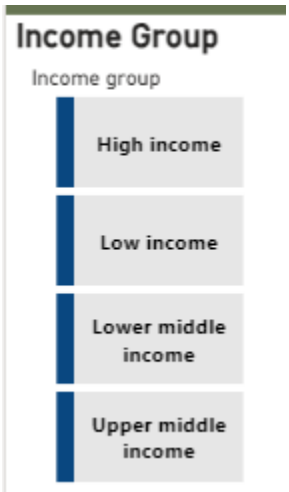


Figure 1.24: The figure above shows the **Income group slicer**, by using the "Tiles" designed on the Visualisations area and placing "blue left borders".

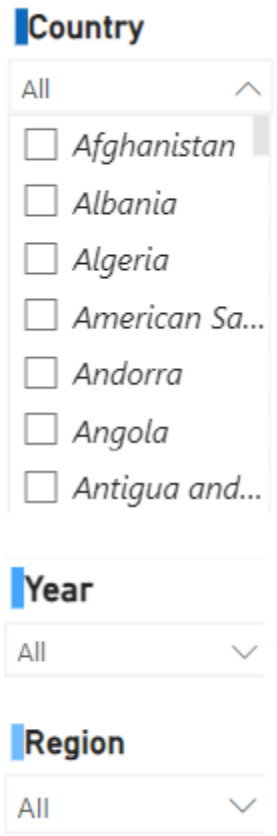


Figure 1.25: The figure above shows the **Country, Year and Region** slicers, by using the "Drop down" designed options on the Visualisations area and placing "blue left borders".

1.6 Data visualization Dash board

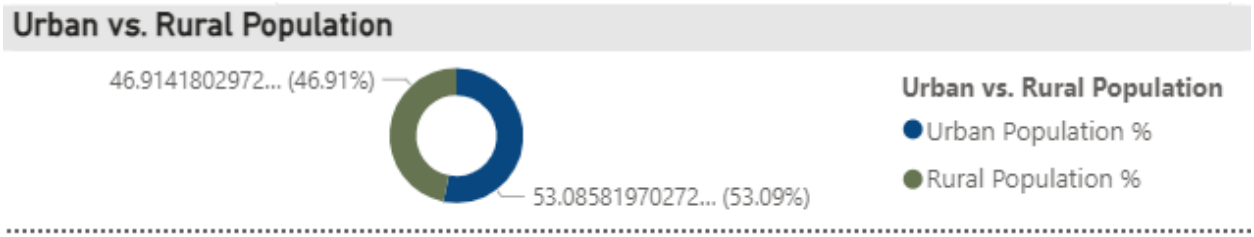


Figure 1.26: The urban-rural population gap is depicted in the donut figure, which also shows rising urbanization tendencies, particularly in affluent areas. It highlights geographical and

economic inequalities in population dynamics by displaying anticipated urban development and rural dominance in low-income areas.

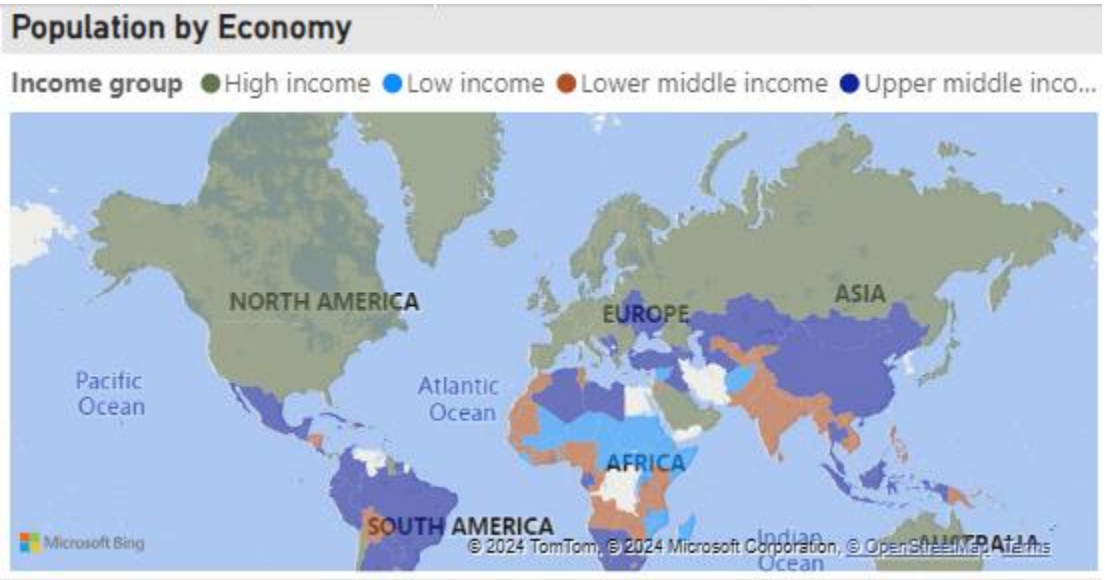


Figure 1.27: What the Map Does. By visualizing population distribution by nation and income group, the map provides information about regional and economic differences.

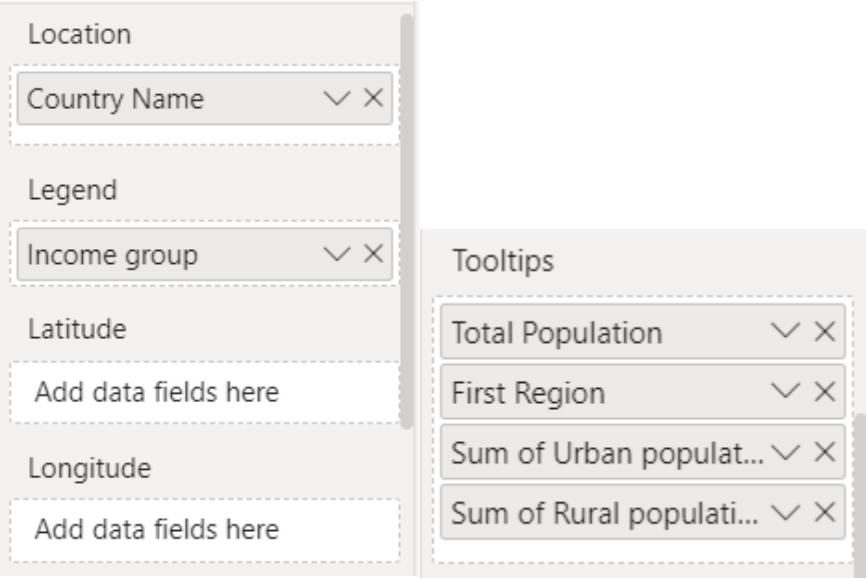


Figure 1.28: Results of the Field Inputs: Country Name establishes locations, Income Group establishes colour groupings for comparison, and Urban, Rural and Total Population provides tooltips with numerical insights.

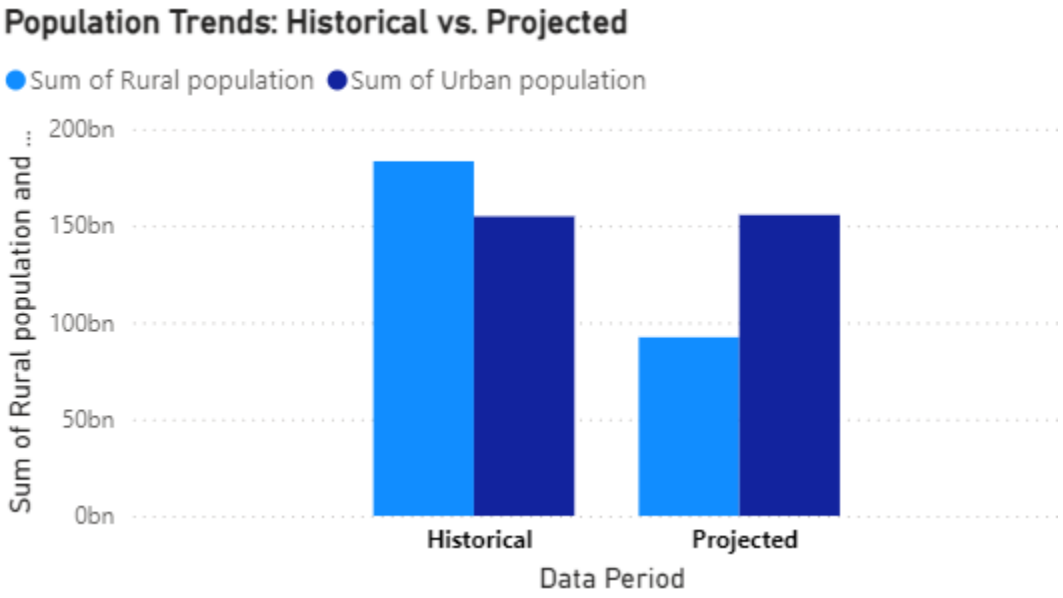


Figure 1.29: What the graphic Does: To comprehend the dynamics of population increase, the **Clustered column chart** contrasts historical and forecast population statistics, emphasising patterns over time.

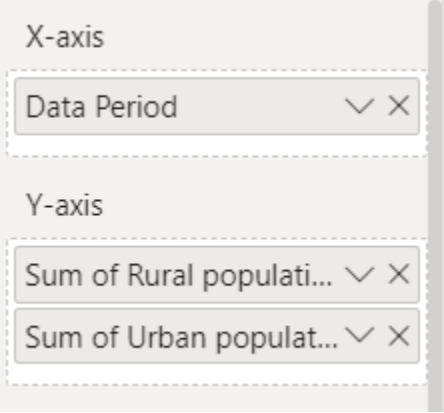


Figure 1.30: The Results of the Field Inputs: Data Period classifies years, Total Population calculates the total growth, and Region/Income Group offers segmentation for in-depth group comparisons.

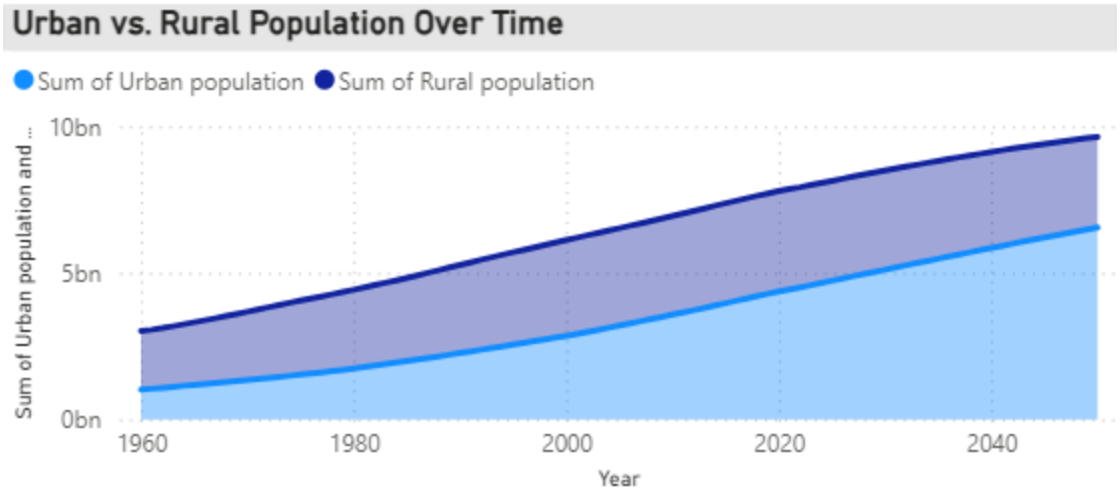


Figure 1.31: The Stacked Area graphic Shows Changes in Urbanisation and Rural Stability. The graph shows changes in the distribution of people in urban and rural areas over time.

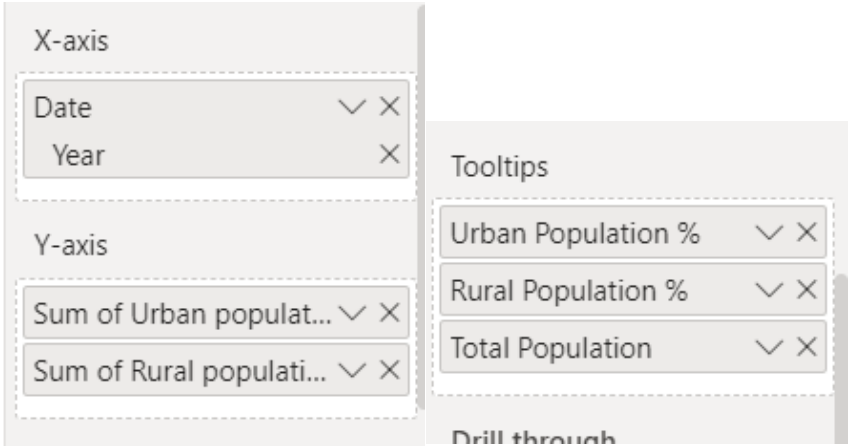


Figure 1.32: What the Field Inputs Have Done: Date (Year) on the X-axis illustrates shifts, and Urban and Rural Population on the Y-axis displays trends in absolute and relative increase. The tooltips add more details to the chart when hovered around.

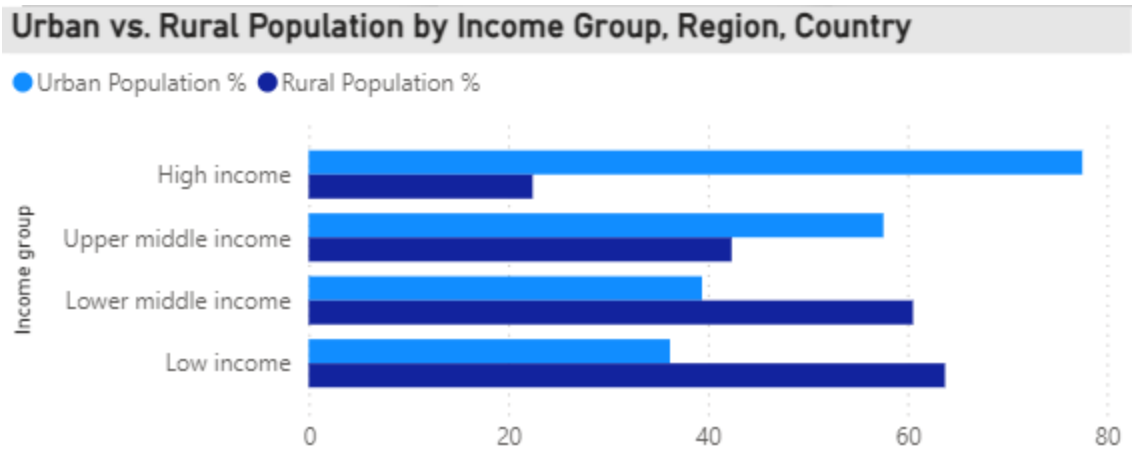


Figure 1.33: The clustered bar chart highlights differences by comparing urban and rural populations across income levels. This allows for drill-down into specific regions and countries.

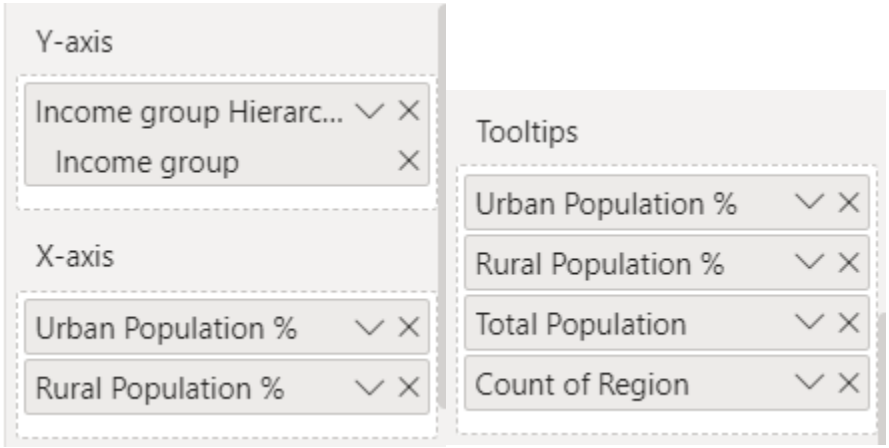


Figure 1.34: Field Inputs for maps; Urban/Rural Populations and Tooltips offer comprehensive insights, while Income Group Hierarchy allows drill-down from income to region and country.

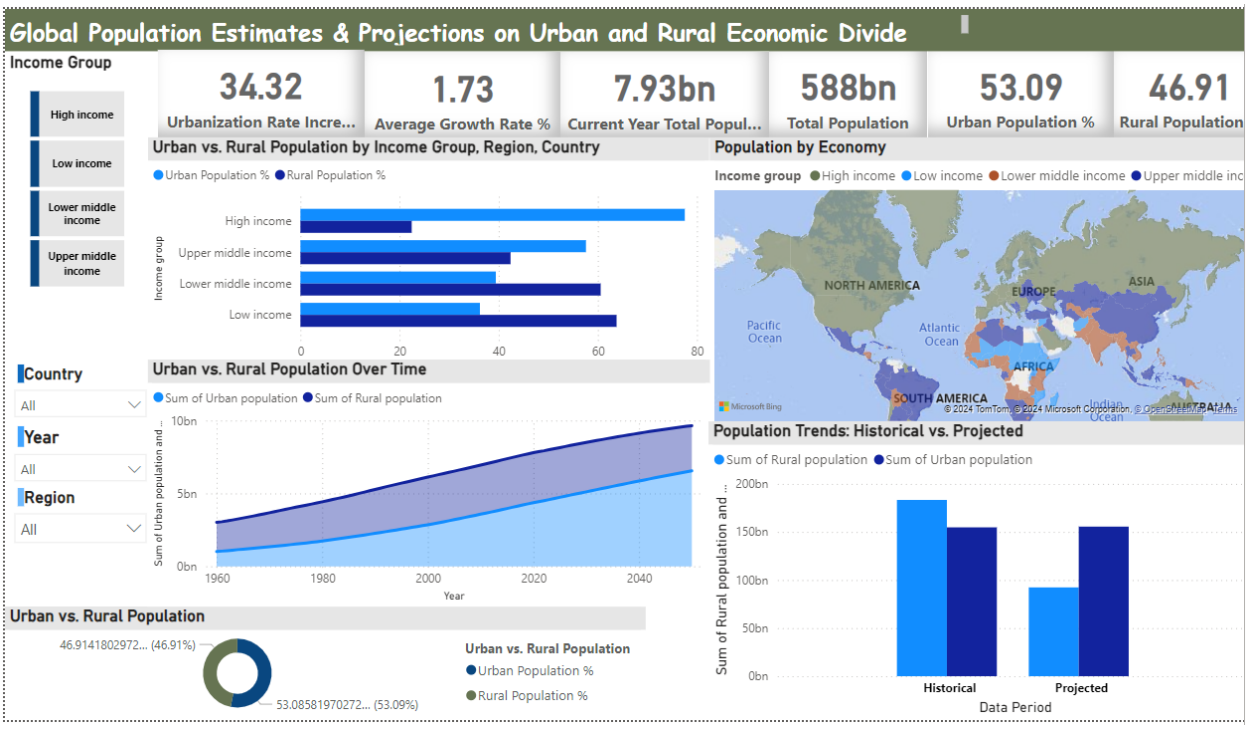


Figure 1.35: Five powerful visualizations on my dashboard reveal population patterns around the world. The **donut chart** emphasizes proportions and draws attention to the urban-rural split. The **stacked area chart** illustrates the growth of urbanization by tracking population patterns over time. The **filled map** shows the geographic distribution of the population. Urban and rural populations are compared across income classes in the **clustered bar chart**. The **clustered column chart** illustrates changes in population patterns by comparing historical and anticipated data periods.

1.6 Discussion

With urban populations steadily increasing, especially in high-income areas, and rural populations either stabilizing or declining, the dashboard illustrates worldwide urbanization trends. By enabling dynamic exploration by time, location, or income bracket, slicers improve engagement. While the clustered bar chart compares urban and rural populations across income levels and reveals notable economic gaps, the stacked area chart highlights urban expansion over time. Clearness and accessibility are guaranteed by visualization principles like

segmentation and interactivity (Few, 2006; Tufte, 2001). This method connects demographic trends with geographic and economic factors to facilitate well-informed decision-making.

1.7 Conclusion

The display highlights the economic effects of urbanization and its accelerating tendencies worldwide. Economic discrepancies are glaring as high-income nations drive the urbanization trend while low-income areas continue to have larger rural populations. While time-based patterns highlight the rural-to-urban transition, interactive visualizations such as maps and donut charts highlight urban-rural dynamics across economic classes. The lack of specific data, such as variations in life expectancy between urban and rural areas, is one of the disadvantages, though. To improve the analysis, future improvements can include more datasets. All things considered, this dashboard is a perfect example of how data-driven solutions may offer vital insights into population patterns and their effects on the economy and society.