Hi, welcome to the Data Professionals channel!

This document is designed to help you complete the project efficiently while learning along the way.

Please support the channel by subscribing, and let us know in the comments what you liked most about this project or what we can improve. Your feedback will help us make the next video (Python, SQL, and Power BI) even better for you.

If you need assistance or collaboration, feel free to reach out:

📧 Email: dataprofessionals237@gmail.com

🎛️ WhatsApp: +233592308335

Scenario

A global research institution is monitoring the impact of climate change across multiple regions. They need a centralized, interactive dashboard to track key climate indicators, visualize extreme weather events, and assess their economic and infrastructural impact in real time.

Business Problem

The organization faces critical challenges in:

❌ **Tracking Climate Trends** – Climate data is scattered and lacks a unified view, making it hard to analyze temperature fluctuations, air quality shifts, and precipitation patterns.

❌ **Generating Actionable Insights** – Traditional reports are static and time-consuming, slowing down decision-making processes.

❌ **Assessing Climate Risks Visually** – There is no structured way to visualize

how extreme weather events impact infrastructure, population exposure, and economic stability across different regions.

To solve these issues, we will develop a **fully interactive Tableau dashboard** that provides **real-time insights**, helping researchers and policymakers quickly identify climate risks and trends at a glance.

Climate Change Dataset: Column Descriptions

Metadata Columns

Record ID

A unique identifier assigned to each individual climate data record.

Date

The specific date when the climate observation was recorded.

Geographic Columns

Country

The nation where the climate data was collected.

City

The specific urban location where the data was gathered.

Climate and Environmental Metrics

Temperature (°C)

Measurement of the ambient air temperature in degrees Celsius.

Humidity (%)

The amount of water vapor present in the air, expressed as a percentage.

Precipitation (mm)

The total amount of rainfall or water equivalent measured in millimeters.

Air Quality Index (AQI)

A numerical scale that indicates the level of air pollution and potential health risks.

Extreme Weather Events

Significant and unusual meteorological occurrences such as hurricanes, heatwaves, or droughts.

Classification and Contextual Columns

Climate Classification (Koeppen)

A scientific system for categorizing global climate types based on temperature and precipitation patterns.

Climate Zone

A broad classification of the ecological climate characteristics of a specific region.

Biome Type

A large-scale biological community defined by its distinctive plant and animal species and environmental conditions.

Meteorological Columns

Heat Index

A combined measure of air temperature and relative humidity that represents how hot it actually feels.

Wind Speed

The rate of air movement measured at the location.

Wind Direction

The compass direction from which the wind is blowing.

Season

The specific time of year when the data was collected.

Impact and Vulnerability Columns

Population Exposure

The number of people potentially affected by the observed climate conditions.

Economic Impact Estimate

A monetary valuation of the potential economic consequences related to the climate conditions.

Infrastructure Vulnerability Score

A numerical rating that assesses the potential risk and susceptibility of infrastructure to climate-related challenges.

1. Tableau

Avg AQI

AVG([Air Quality Index])

Current Month AQI

IF DATENAME('month', [Date]) = [Current Month] THEN

{FIXED DATENAME('month', [Date]) : AVG([Air Quality Index])}

END

Previous Month AQI

IF DATENAME('month', [Date]) =

case [Current Month]

WHEN 'January' THEN 'December'

WHEN 'February' THEN 'January'

WHEN 'March' THEN 'February'

WHEN 'April' THEN 'March'

WHEN 'May' THEN 'April'

WHEN 'June' THEN 'May'

WHEN 'July' THEN 'June'

WHEN 'August' THEN 'July'

WHEN 'September' THEN 'August'

WHEN 'October' THEN 'September'

WHEN 'November' THEN 'October'

WHEN 'December' THEN 'November'

END

THEN {FIXED DATENAME('month', [Date]) : AVG([Air Quality Index])}

END

% Difference AQI

(AVG([Current Month AQI]) - AVG([Previous Month AQI])) / AVG([Previous Month AQI])

Bad Percentage AQI

IF [% Difference AQI] >= 0.03

THEN

   IF [% Difference AQI] > 0

   THEN "▲ " + STR(ROUND([% Difference AQI] * 100, 2)) + "%" // Increase (bad)

   ELSE "▼ " + STR(ROUND([% Difference AQI] * 100, 2)) + "%" // Decrease (bad)

   END

ELSE

""

END

Good Percentage AQI

IF [% Difference AQI] < 0.03

THEN

   IF [% Difference AQI] > 0

   THEN "▲ " + STR(ROUND([% Difference AQI] * 100, 2)) + "%" // Increase (good)

   ELSE "▼ " + STR(ROUND([% Difference AQI] * 100, 2)) + "%" // Decrease (good)

   END

ELSE

""

END

Count of EWE

IF [Extreme Weather Events] <> "None" THEN 1 ELSE 0

END

Current Month EWE

IF DATENAME('month', [Date]) = [Current Month] THEN [Count of EWE]

END

Previous Month EWE

IF DATENAME('month', [Date]) =

case [Current Month]

   WHEN 'January' THEN 'December'

   WHEN 'February' THEN 'January'

   WHEN 'March' THEN 'February'

WHEN 'April' THEN 'March'

WHEN 'May' THEN 'April'

WHEN 'June' THEN 'May'

WHEN 'July' THEN 'June'

WHEN 'August' THEN 'July'

WHEN 'September' THEN 'August'

WHEN 'October' THEN 'September'

WHEN 'November' THEN 'October'

WHEN 'December' THEN 'November'

END

THEN [Count of EWE]

END

% Difference EWE

(SUM([Current Month EWE]) - SUM([Previous Month EWE])) / SUM([Previous Month EWE])

Bad Percentage EWE

IF [% Difference EWE] > 0 THEN "▲ " + STR(ROUND([% Difference EWE] * 100, 2)) + "%"

ELSE

""

END

Good Percentage EWE

IF [% Difference EWE] < 0 THEN "▼ " + STR(ROUND([% Difference EWE] * 100, 2)) + "%"

ELSE

""

END

Avg Precipitation Intensity

AVG([Precipitation])

Current Month Precipitation Intensity

IF DATENAME('month', [Date]) = [Current Month] THEN

{FIXED DATENAME('month', [Date]) : AVG([Precipitation])}

END

Previous Month Precipitation Intensity

IF DATENAME('month', [Date]) =

case [Current Month]

   WHEN 'January' THEN 'December'

   WHEN 'February' THEN 'January'

   WHEN 'March' THEN 'February'

   WHEN 'April' THEN 'March'

   WHEN 'May' THEN 'April'

   WHEN 'June' THEN 'May'

   WHEN 'July' THEN 'June'

   WHEN 'August' THEN 'July'

   WHEN 'September' THEN 'August'

   WHEN 'October' THEN 'September'

   WHEN 'November' THEN 'October'

   WHEN 'December' THEN 'November'

   END

THEN {FIXED DATENAME('month', [Date]) : AVG([Precipitation])}

END

% Difference Precipitation Intensity

(AVG([Current Month Precipitation Intensity]) - AVG([Previous Month Precipitation Intensity]))
/ AVG([Previous Month Precipitation Intensity])

Bad Percentage Precipitation Intensity

IF [% Difference Precipitation Intensity] <= -0.02 or [% Difference Precipitation Intensity] >=
0.02 THEN

   IF [% Difference Precipitation Intensity] > 0

   THEN "▲ " + STR(ROUND([% Difference Precipitation Intensity] * 100, 2)) + "%"

   ELSE "▼ " + STR(ROUND([% Difference Precipitation Intensity] * 100, 2)) + "%"

   END

ELSE

""

END

Good Percentage Precipitation Intensity

IF [% Difference Precipitation Intensity] > -0.02 AND [% Difference Precipitation Intensity] <
0.02 THEN

   IF [% Difference Precipitation Intensity] > 0

   THEN "▲ " + STR(ROUND([% Difference Precipitation Intensity] * 100, 2)) + "%"

   ELSE "▼ " + STR(ROUND([% Difference Precipitation Intensity] * 100, 2)) + "%"

   END

ELSE

""

END

Avg Temperature

AVG([Temperature])

Current Month Temperature

IF DATENAME('month', [Date]) = [Current Month] THEN

{FIXED DATENAME('month', [Date]) : AVG([Temperature])}

END

Previous Month Temperature

IF DATENAME('month', [Date]) =

case [Current Month]

   WHEN 'January' THEN 'December'

   WHEN 'February' THEN 'January'

   WHEN 'March' THEN 'February'

   WHEN 'April' THEN 'March'

   WHEN 'May' THEN 'April'

   WHEN 'June' THEN 'May'

   WHEN 'July' THEN 'June'

   WHEN 'August' THEN 'July'

   WHEN 'September' THEN 'August'

   WHEN 'October' THEN 'September'

   WHEN 'November' THEN 'October'

   WHEN 'December' THEN 'November'

   END

THEN {FIXED DATENAME('month', [Date]) : AVG([Temperature])}

END

% Difference Temperature

(AVG([Current Month Temperature]) - AVG([Previous Month Temperature])) / AVG([Previous Month Temperature])

Bad Percentage Temperature

IF [% Difference Temperature] >= 0.03 OR [% Difference Temperature] <= -0.03

THEN

    IF [% Difference Temperature] > 0

    THEN "▲ " + STR(ROUND([% Difference Temperature] * 100, 2)) + "%"

    ELSE "▼ " + STR(ROUND([% Difference Temperature] * 100, 2)) + "%"

    END

ELSE

""

END

Good Percentage Temperature

IF [% Difference Temperature] > -0.03 AND [% Difference Temperature] < 0.03

THEN

    IF [% Difference Temperature] > 0

    THEN "▲ " + STR(ROUND([% Difference Temperature] * 100, 2)) + "%"

    ELSE "▼ " + STR(ROUND([% Difference Temperature] * 100, 2)) + "%"

    END

ELSE

""

END

Temperature Variability

STDEV([Temperature])

Current Month Temperature Variability

IF DATENAME('month', [Date]) = [Current Month] THEN

{FIXED DATENAME('month', [Date]) : STDEV([Temperature])}

END

Previous Month Temperature Variability

IF DATENAME('month', [Date]) =

case [Current Month]

   WHEN 'January' THEN 'December'

   WHEN 'February' THEN 'January'

   WHEN 'March' THEN 'February'

   WHEN 'April' THEN 'March'

   WHEN 'May' THEN 'April'

   WHEN 'June' THEN 'May'

   WHEN 'July' THEN 'June'

   WHEN 'August' THEN 'July'

   WHEN 'September' THEN 'August'

   WHEN 'October' THEN 'September'

   WHEN 'November' THEN 'October'

   WHEN 'December' THEN 'November'

   END

THEN {FIXED DATENAME('month', [Date]) : STDEV([Temperature])}

END

% Difference Temperature Variability

(AVG([Current Month Temperature Variability]) - AVG([Previous Month Temperature Variability])) / AVG([Previous Month Temperature Variability])

Bad Percentage Temperature Variability

IF [% Difference Temperature Variability] >= 0.01 THEN

   IF [% Difference Temperature Variability] > 0

   THEN "▲ " + STR(ROUND([% Difference Temperature Variability] * 100, 2)) + "%"

   ELSE "▼ " + STR(ROUND([% Difference Temperature Variability] * 100, 2)) + "%"

   END

ELSE

""

END

Good Percentage Temperature Variability

IF [% Difference Temperature Variability] < 0.01 THEN

   IF [% Difference Temperature Variability] > 0

   THEN "▲ " + STR(ROUND([% Difference Temperature Variability] * 100, 2)) + "%"

   ELSE "▼ " + STR(ROUND([% Difference Temperature Variability] * 100, 2)) + "%"

   END

ELSE

""

END