INNOMATICS®
RESEARCH LABS

INNOVATION. AUTOMATION. ANALYTICS

PRESENTATION ON

Telangana Weather Data Analysis (2021–24)

Presented By:
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About Me

- My name is E.Praneeth Goud. I'm a **B.Tech** Graduate with a keen interest in Data Science. I enjoy working with data, discovering insights, and visualize the data.

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AGENDA:

1. Introduction
2. Business Problem
3. Project Objectives
4. Dataset Overview & Data Modelling
5. Dashboard Overview
6. Rainfall Analysis
7. Temperature Analysis
8. Humidity Analysis
9. Wind Speed Analysis
10. Key Insights & Conclusion

INNOMATICS RESEARCH LABS

INTRODUCTION:

- Weather plays a critical role in agriculture, water management, disaster preparedness, and infrastructure planning.

- Telangana experiences significant seasonal and regional weather variations.

- This project analyzes Telangana's weather data from 2021–2024 using Power BI to derive insights on rainfall, temperature, humidity, and wind speed.

BUSINESS PROBLEM

- Weather conditions in Telangana show significant seasonal and regional variation across districts and mandals.
- Historical weather data exists but lacks a centralized and interactive analytical view.
- Identifying trends, seasonal patterns, and extreme weather events becomes challenging.
- This limits data-driven decision-making for agriculture planning, water management, and disaster preparedness.

OBJECTIVES:

- Analyze historical weather data of Telangana (2021–2024).
- Identify seasonal and yearly trends.
- Compare district-wise and mandal-wise variations.
- Detect extreme and anomalous weather conditions.
- Present insights using an interactive Power BI dashboard.

DATASET OVERVIEW

- Historical weather data of Telangana from 2021 to 2024.
- Daily observations at district and mandal levels.
- Key parameters include:

  Rainfall (mm)

  Min & Max Temperature (°C)

  Min & Max Humidity (%)

  Min & Max Wind Speed (kmph)
- Data was cleaned, merged, and transformed using Power Query.

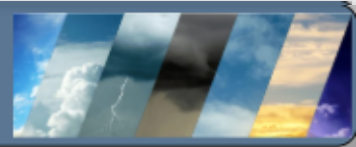
DATA PREPARATION & MODELLING

- Multiple CSV files were combined using Power Query
- Date hierarchy created using Year, Month, and Month Number.
- Calculated measures were created using DAX to derive meaningful insights such as:
- Average Daily temperature, humidity range, and wind speed
- Data was cleaned to handle missing values and inconsistencies.

DASHBOARD OVERVIEW

- An interactive Power BI dashboard was created to analyze Telangana weather data.
- The dashboard is divided into multiple pages, each focusing on a specific weather parameter.
- Users can navigate between pages using navigation buttons.
- Slicers are provided to filter data by Year, District, and Month.

Comprehensive Weather Overview



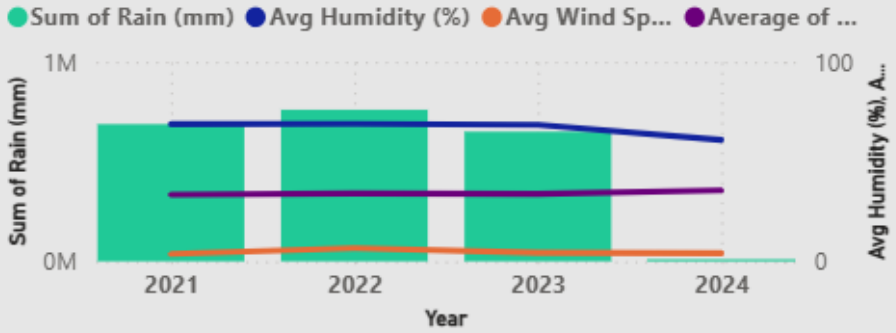
2.11M	34.0	21.8	4.8	67.9
Total Rainfall (mm)	Average Max Temp (°C)	Average Min Temp (°C)	Avg Wind Speed (kmph)	Avg Humidity (%)

Year: All

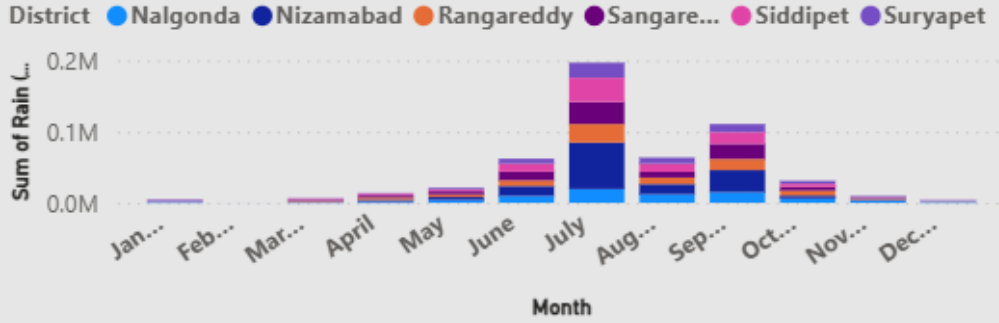
District: All

Month: All

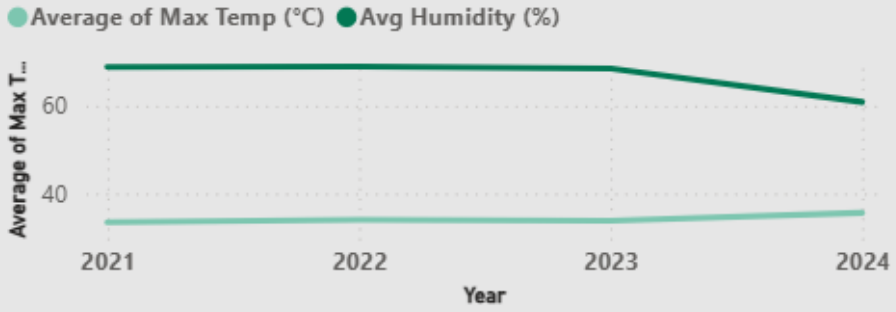
Year-wise Comparison of Rainfall,Temp,Humidity,Wind Speed



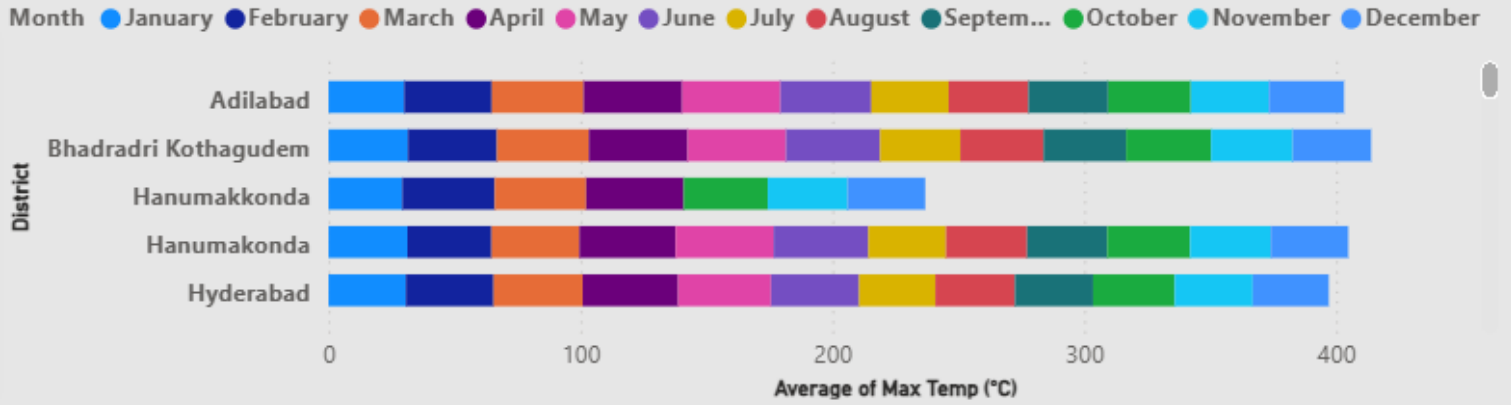
Monthly Rainfall Distribution Across Districts (mm)



Relationship Btw Avg Maximum Temperature and Humidity Over Years

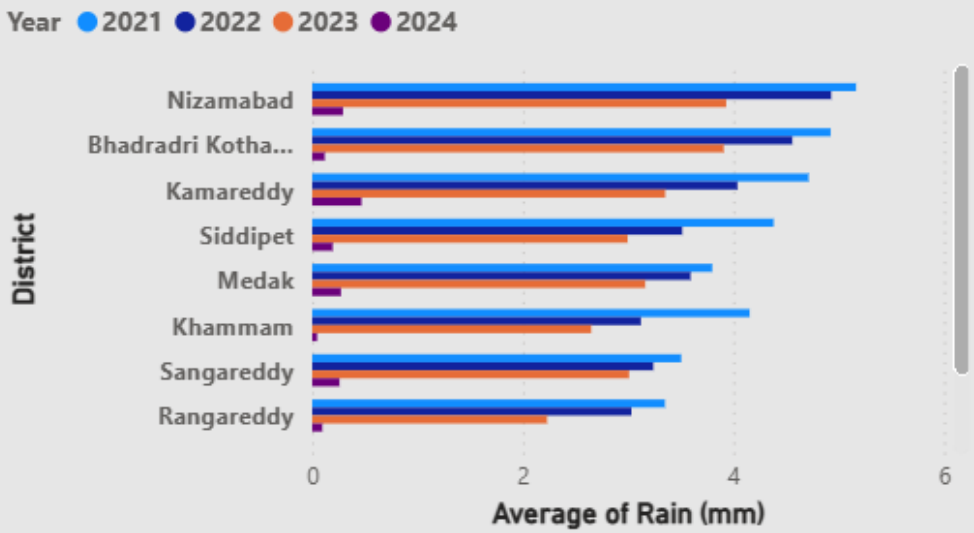


Monthly Average Maximum Temperature by District (°C)

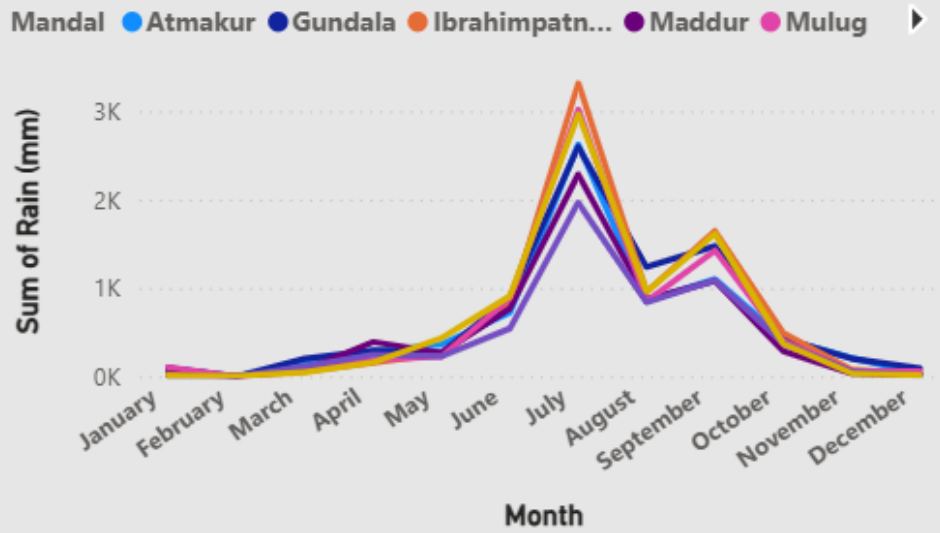


Rainfall Analysis

District-wise Average Rainfall Across Years (mm)



Monthly Rainfall Trends Across Mandals (mm)



Year

All

District

All

Month

All

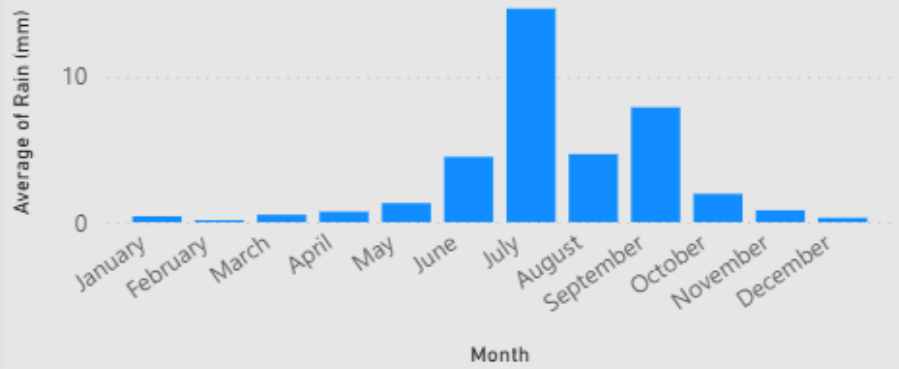
Date

01-04-2021 30-04-2024

Monthly Rainfall Distribution by Mandal (mm)

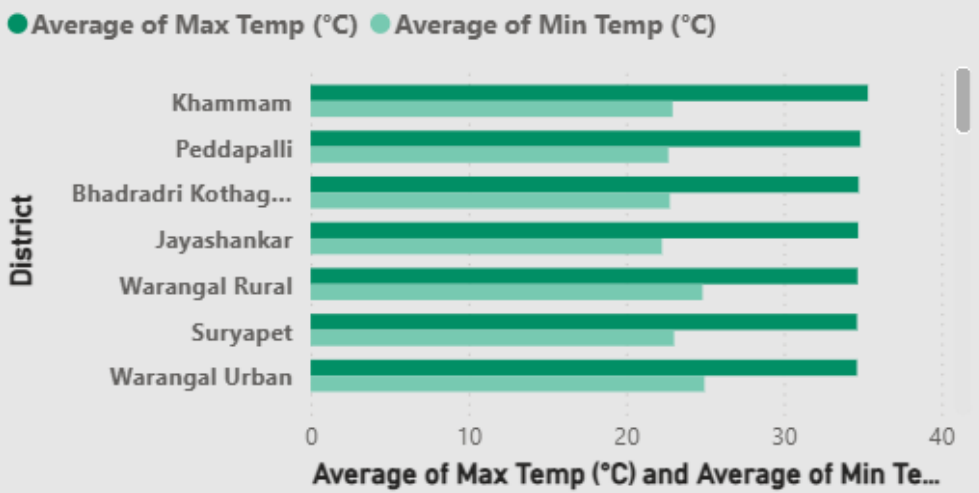
Mandal	January	February	March	April	May	June	July	August	S
Abdullapurmet	1.40	0.00	21.90	74.20	145.80	254.70	1,046.50	337.00	
Achampet	17.30	0.00	13.70	38.40	184.10	245.60	466.70	275.90	
Adavi Devula Palli	15.30	0.00	42.60	58.70	97.90	195.80	479.10	453.90	
Addagudur	28.60	0.00	32.30	77.20	121.90	396.40	1,025.50	531.10	
Addakal	12.70	0.00	16.50	41.80	124.80	332.50	715.80	430.40	
Adilabad Rural	54.60	9.10	30.60	63.70	100.50	584.50	2,305.00	641.90	
Adilabad Urban	18.10	5.90	37.40	142.20	153.30	694.50	1,634.00	647.30	
Aiza	0.20	0.00	10.40	76.10	147.20	173.90	570.90	335.40	
Alair	25.00	0.60	49.40	61.90	138.40	381.00	965.50	426.90	
Total	19,779.70	639.30	28,590.40	51,879.40	84,864.00	2,43,014.10	8,16,139.00	2,61,073.80	4

Comparison of Average Rainfall by Month (mm)

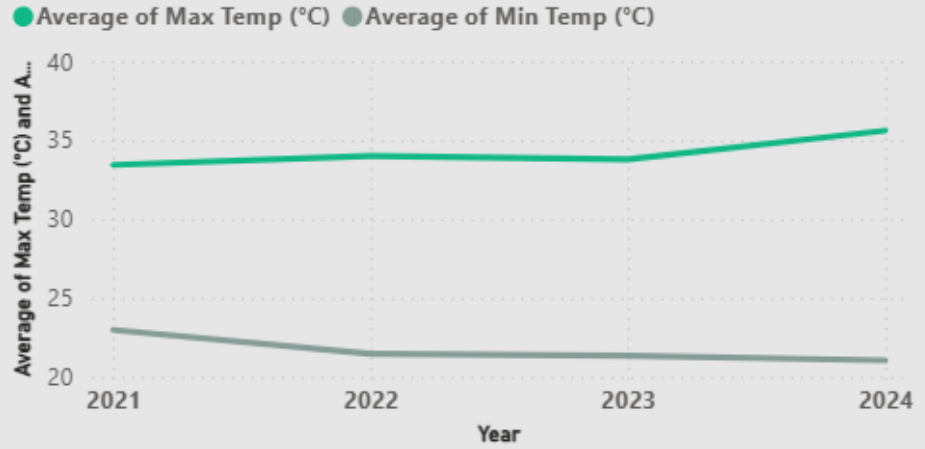


Temperature Insights

Average Minimum and Maximum Temperature by District (°C)



Year-wise Trend of Avg Minimum & Maximum Temperature (°C)



Year

All

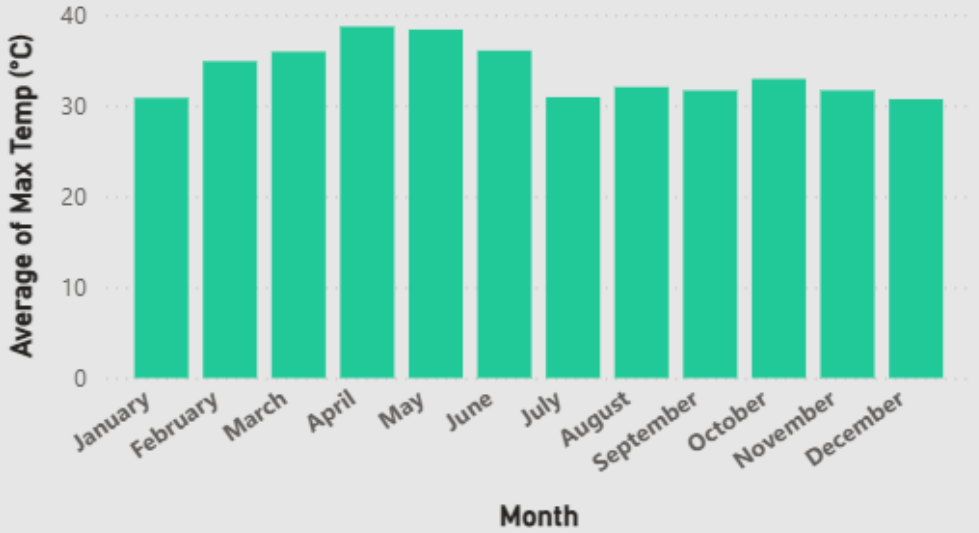
District

All

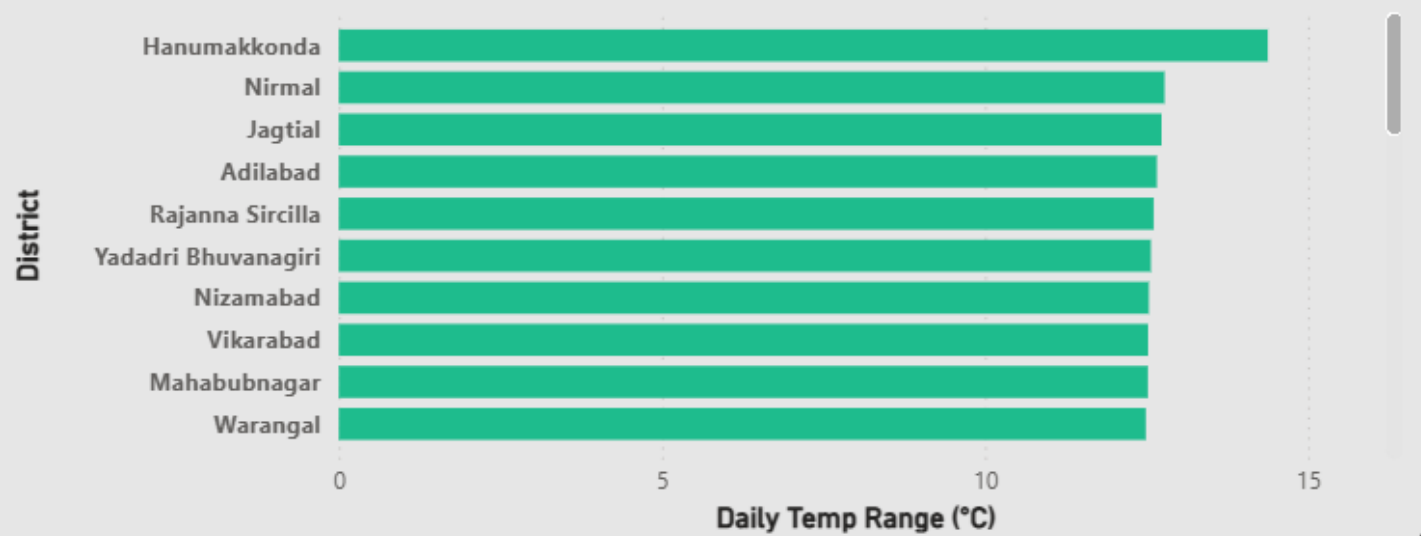
Month

All

Monthly Average of Maximum Temperature (°C)

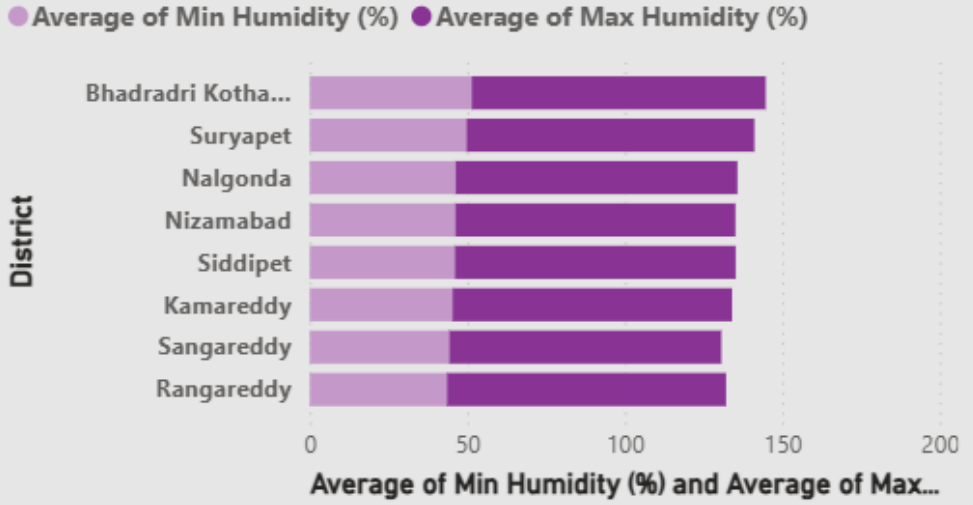


Average Daily Temperature Range by District (°C)

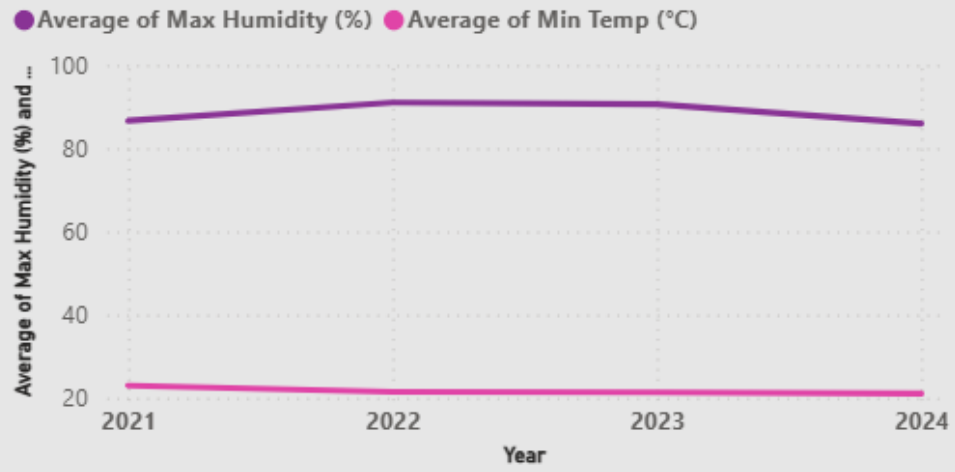


Humidity Analysis

Average Minimum & Maximum Humidity Levels by District (%)



Year-wise Trend of Maximum Humidity and Minimum Temperature



Year

All

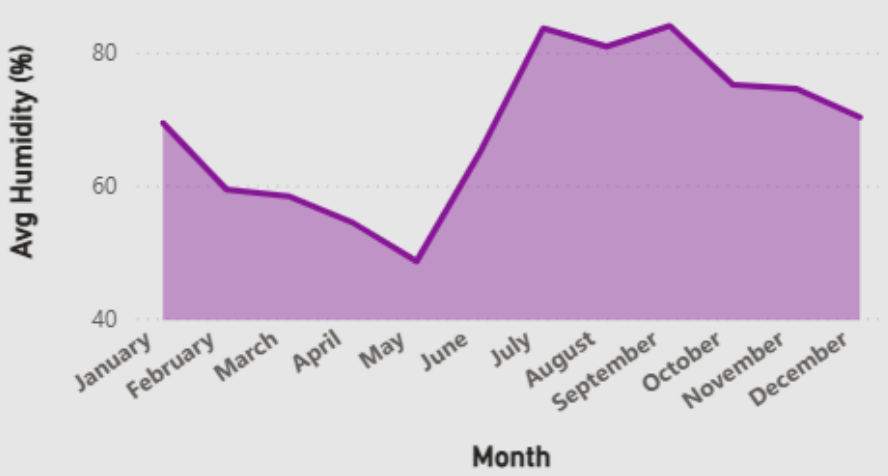
District

All

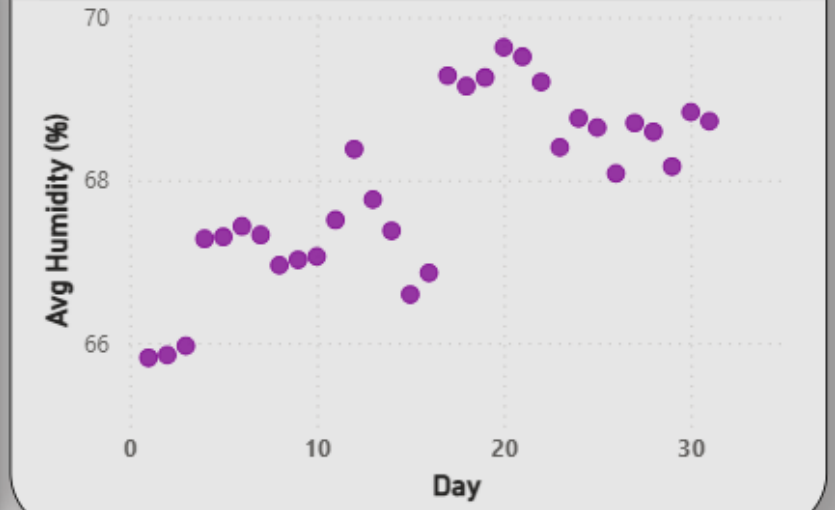
Month

All

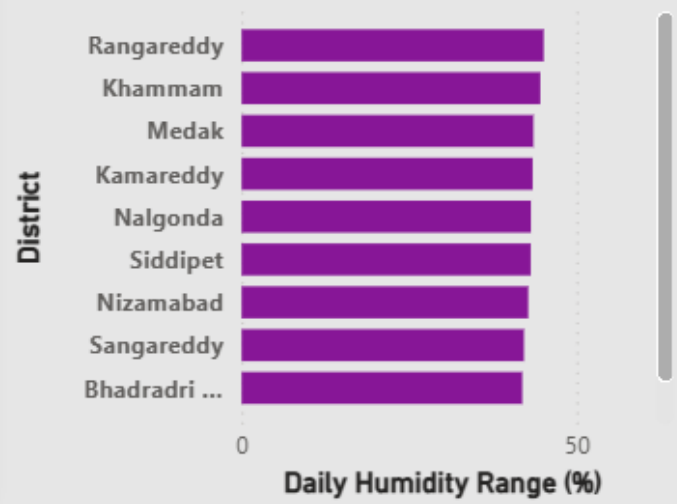
Seasonal Variation of Average Humidity (%)



Daily Distribution of Average Humidity Levels (%)

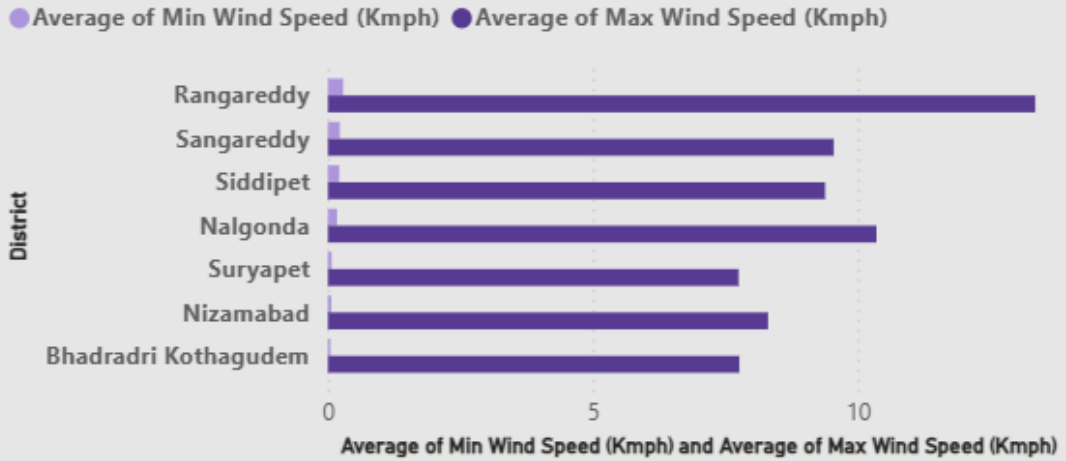


Average Daily Humidity Range by District (%)

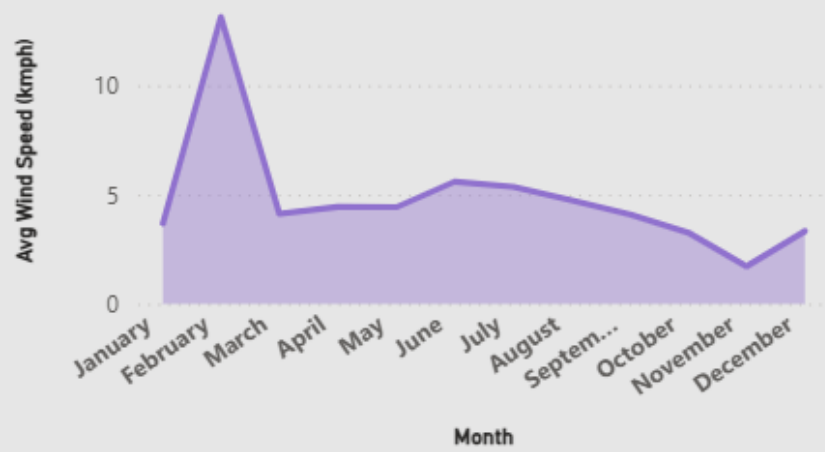


Wind Speed Analysis

Average Minimum and Maximum Wind Speed by District (kmph)



Monthly Variation of Average Wind Speed (kmph)

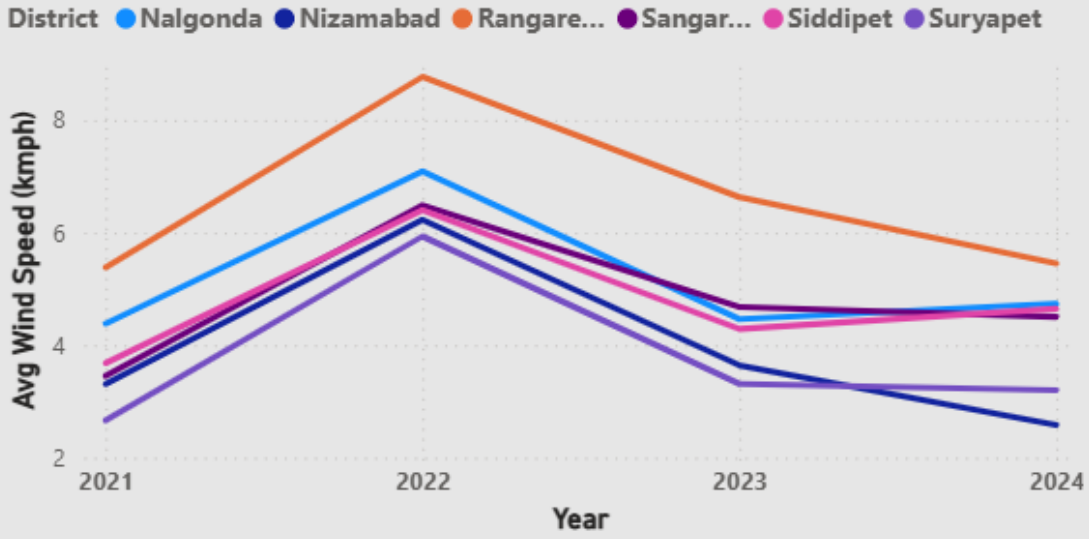


Year
All

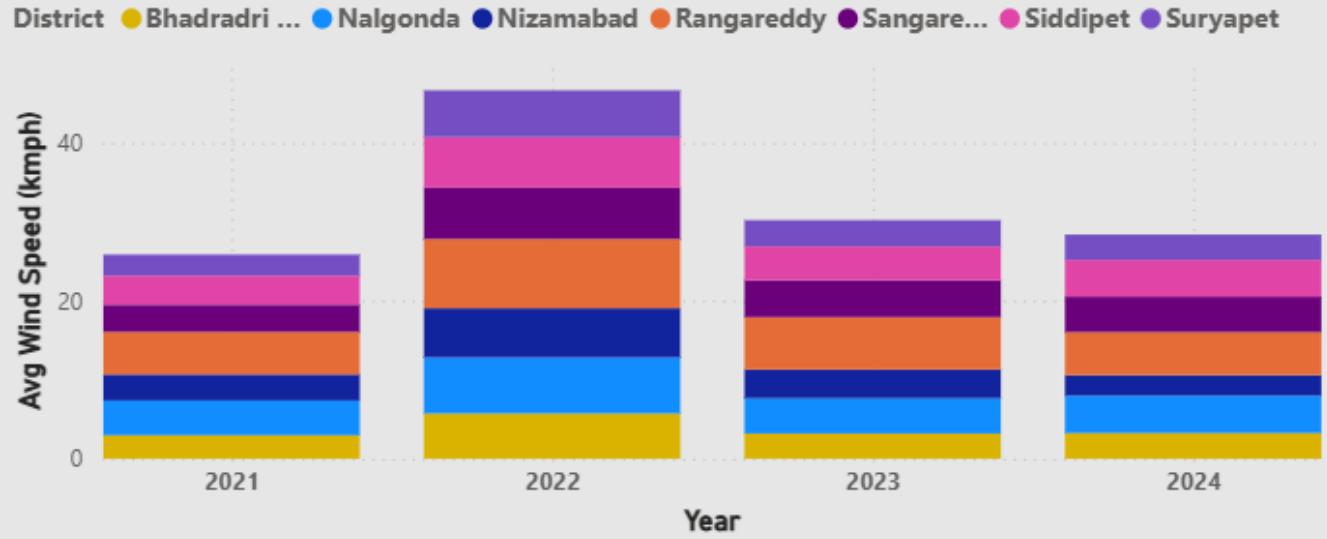
District
All

Month
All

Year-wise Trend of Average Wind Speed Across Districts



District-wise Contribution to Average Wind Speed by Year



KEY INSIGHTS

Rainfall Insights

- A large majority of annual rainfall (approximately 70–80%) occurs during the monsoon months, confirming strong seasonal dependence.
- Non-monsoon months contribute only a small fraction of total rainfall, indicating prolonged dry periods across most districts.
- Rainfall distribution is uneven across districts, with a few districts consistently contributing a higher share of total rainfall compared to others.

Temperature Insights

- Maximum temperatures show a clear seasonal rise, with summer months accounting for the highest temperature ranges across the year.
- Minimum temperatures remain relatively stable, with less variation compared to maximum temperatures, indicating higher daytime heat fluctuations.
- A major portion of extreme temperature values is concentrated within specific months, highlighting seasonal temperature intensity.

KEY INSIGHTS

Humidity Insights

- Nearly 60–70% of high humidity observations occur during periods of increased rainfall, showing a strong correlation between humidity and rainfall.
- During dry months, humidity levels drop significantly, accounting for a smaller proportion of overall humidity levels.
- Certain districts consistently record higher humidity ranges, contributing a larger share of high-humidity observations.

Wind Speed Insights

- Most wind speed values fall within a moderate range, while extreme wind events represent a small percentage of total observations.
- A limited number of months contribute to a major share of higher wind speed values, indicating seasonal wind patterns.
- Wind speed variability differs across districts, with some regions showing higher concentration of extreme wind events.

Conclusion:

- Successfully analyzed multi-year Telangana weather data using Power BI.
- Identified seasonal patterns, regional variations, and extreme events.
- Delivered a centralized and interactive analytical dashboard.

Recommendations / Future Scope:

- Support agriculture and water resource planning.
- Assist in disaster preparedness and risk mitigation.
- Extend analysis using real-time data and forecasting models.

THANK YOU

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