


Natural Disasters Impact Analysis

 **Title:** Analyzing the Socio-Economic Impact of Natural Disasters Using Data Engineering & Visualization

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1. Introduction

Natural disasters have profound effects on human lives, infrastructure, and economies. Understanding the frequency, severity, and socio-economic impact of these disasters can help policymakers and organizations develop better disaster response and mitigation strategies.

This project leverages data from **EM-DAT, NOAA, and ISO ip2 Location** to analyze the impact of disasters over time, visualize trends, and identify correlations between disaster frequency and economic factors.

2. Objectives

1. **Identify trends** in natural disaster occurrences over time.
 2. **Analyze economic and human impact** of different types of disasters.
 3. **Correlate disaster frequency** with socio-economic indicators such as GDP, population density, and disaster recovery costs.
 4. **Build interactive visualizations** in **Tableau** to communicate insights.
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3. Data Sources

- **NOAA Storm Events Database**
Provides historical storm event records with location and damage costs.
- **[EM-DAT: The International Disaster Database](#)**
Includes global disaster impact data (fatalities, economic damage, affected population).
- **Additional sources:** Ip2Location ISO 3166-2 data for location granularity.

4. Methodology

Data Engineering

- **Preprocessing:** Cleaned and normalized raw datasets.
- **Database Setup:** Stored cleaned data in a **PostgreSQL database** for efficient querying.
- **Feature Engineering:** Created custom metrics like disaster severity and impact scores.

Data Analysis

- **SQL Queries:** Extracted relevant insights using PostgreSQL.

Data Visualization

- **Tableau Dashboards:** Created interactive reports showing trends & patterns.
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5. Key Findings

1. **Disaster Frequency:**
 - The occurrence of extreme weather events has increased in the last two decades.
 2. **Economic Impact:**
 - Some disaster types (e.g., hurricanes) have disproportionately high financial damages.
 3. **Geographical Trends:**
 - Certain regions are more prone to specific disaster types (e.g., wildfires in California, hurricanes in coastal regions).
 4. **Correlation with Economic Factors:**
 - Higher GDP regions tend to have **higher disaster recovery costs** but lower **casualty rates** due to better infrastructure.
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6. Interactive Dashboards

View Tableau Dashboard :

https://public.tableau.com/app/profile/subhash.h.jayanna/viz/VisualizationsonnaturaldisastersdatainAsiancontinentincludingsocio-economicimpacts_2000-2024/Story1?publish=yes

7. Conclusion & Next Steps

This project provided a data-driven analysis of natural disaster trends. Future improvements could include:

- Incorporating **climate change models** to predict future disaster risks.
 - Enhancing database efficiency for **real-time disaster tracking**.
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8. References

- NOAA (National Oceanic and Atmospheric Administration)
- EM-DAT (Emergency Events Database)