



Explore Time Series: Flood



Meet the Team



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Background: Engineering

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**More than 400
millimeters of
Monsoonal Rain has
affected India in
December of 2023**

Main Finding

More Area per square feet was affected by floods as the duration of the flood increased, leading to property damage



Agenda

- Business Problem
- Data Overview
- Analysis
- Recommendations
- Future Steps

Business Problem

Floods are highly destructive natural disasters, and India is increasingly vulnerable to their frequent and severe impacts. This results in tragic consequences, particularly in regions facing pronounced damage, leading to loss of lives and livelihoods.



Data Overview

DATA:

- Mongabay- Freely available spatial dataset to make flood research easier

FILTERS:

- Years (2000-2016)
- Removed Duplicates
- 4738 datapoints

LIMITATIONS:

- We do not know about the severity of the floods
- We do not know the exact number of fatalities and injuries
- Undocumented Locations/Districts



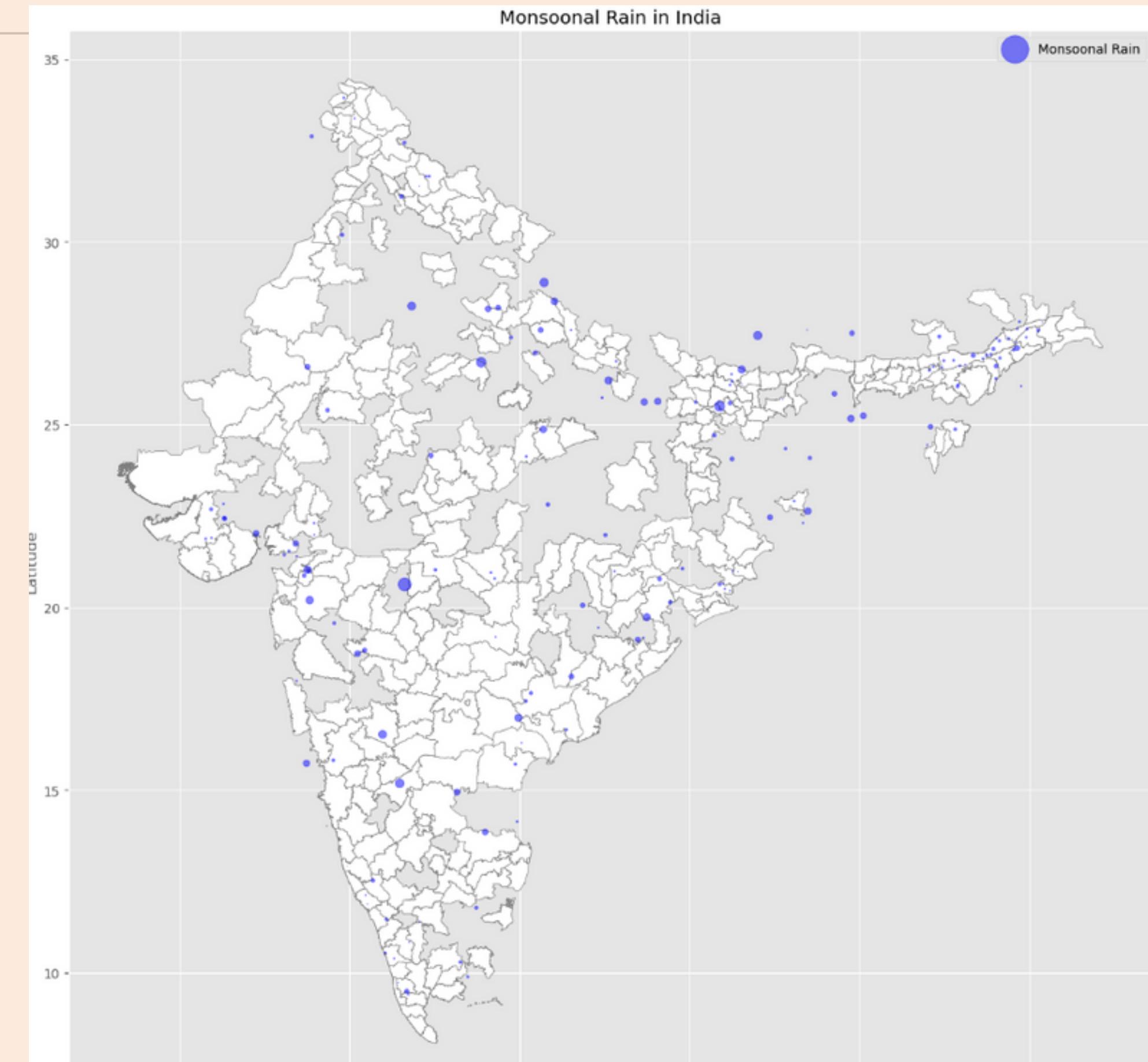
Data Analysis

Primary effects of Floods

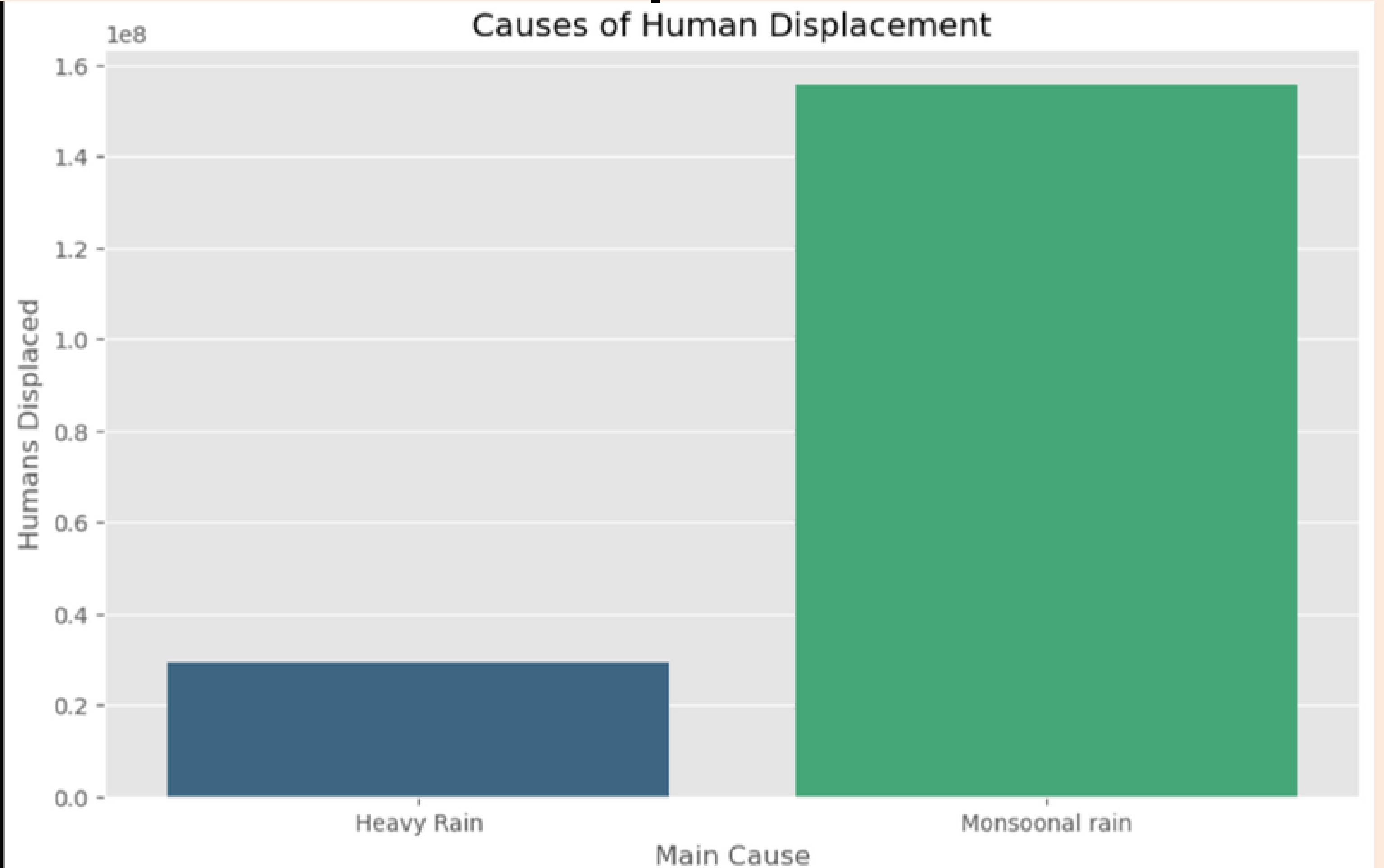
- Property loss
- The loss of life



Coastal Regions are impacted the most by Monsoonal Rains



More Humans are Displaced due to Monsoonal Rains



Modelling

Parameters:

- Resampled Monthly
- More weight on recent data points when calculating average

ARIMA Model

AIC

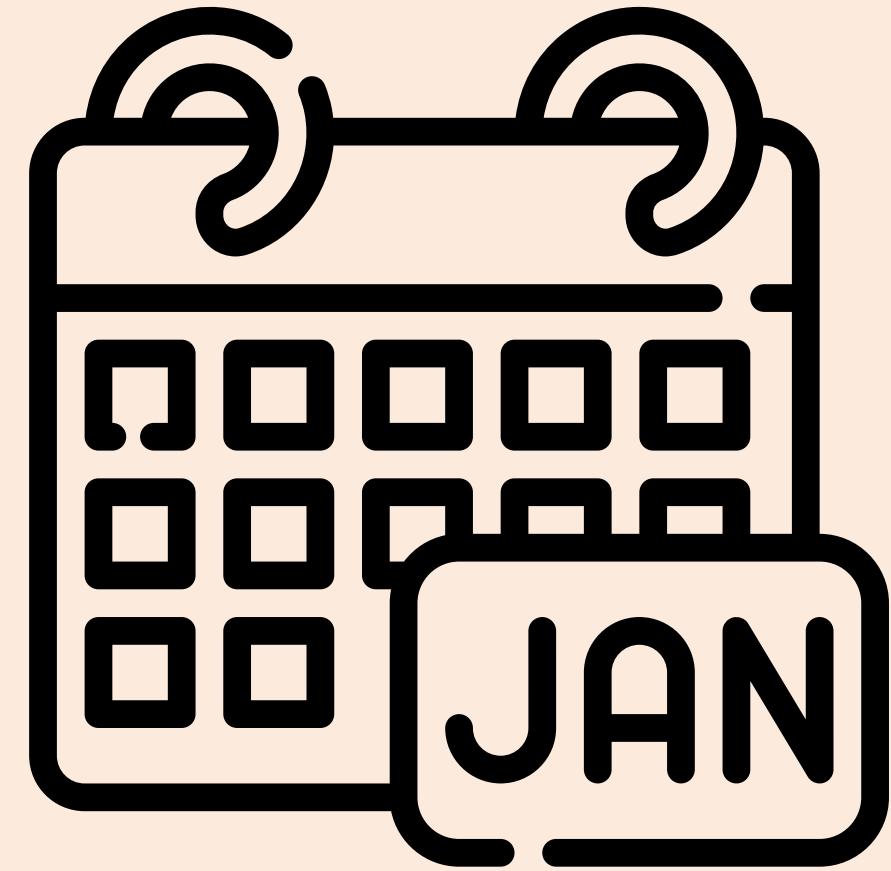
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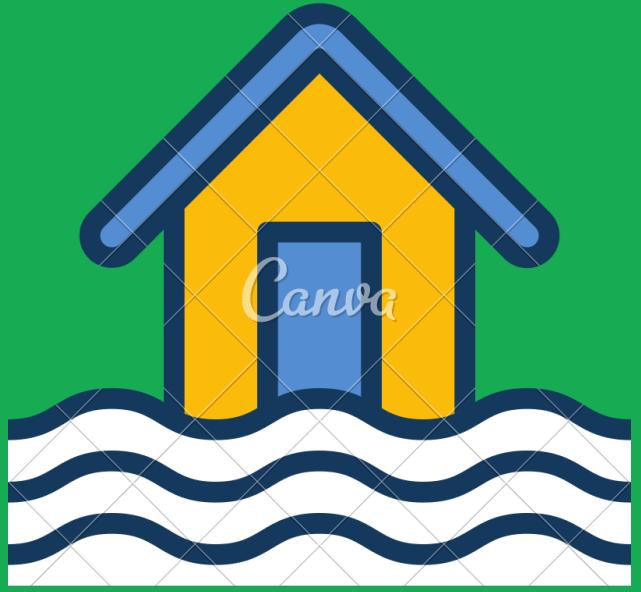
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Future Forecasting

We can forecast future floods to happen in
January





Reccomendations

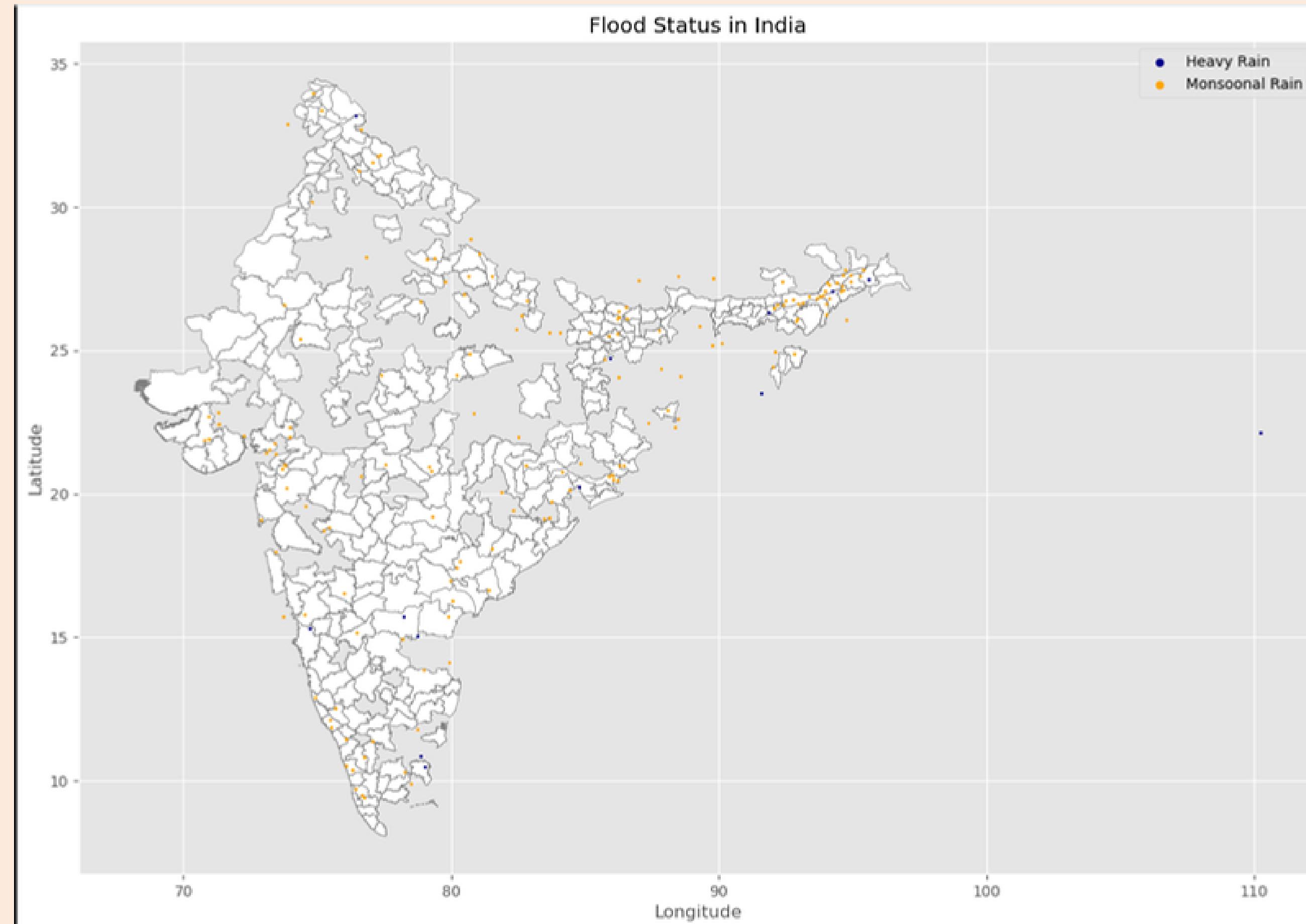
- 01.** Understand local risks, such as storm surges for a particular coastal region
- 02.** Reinforce and elevate infrastructure vulnerable to flooding
- 03.** Establish and train local emergency response teams within the local community



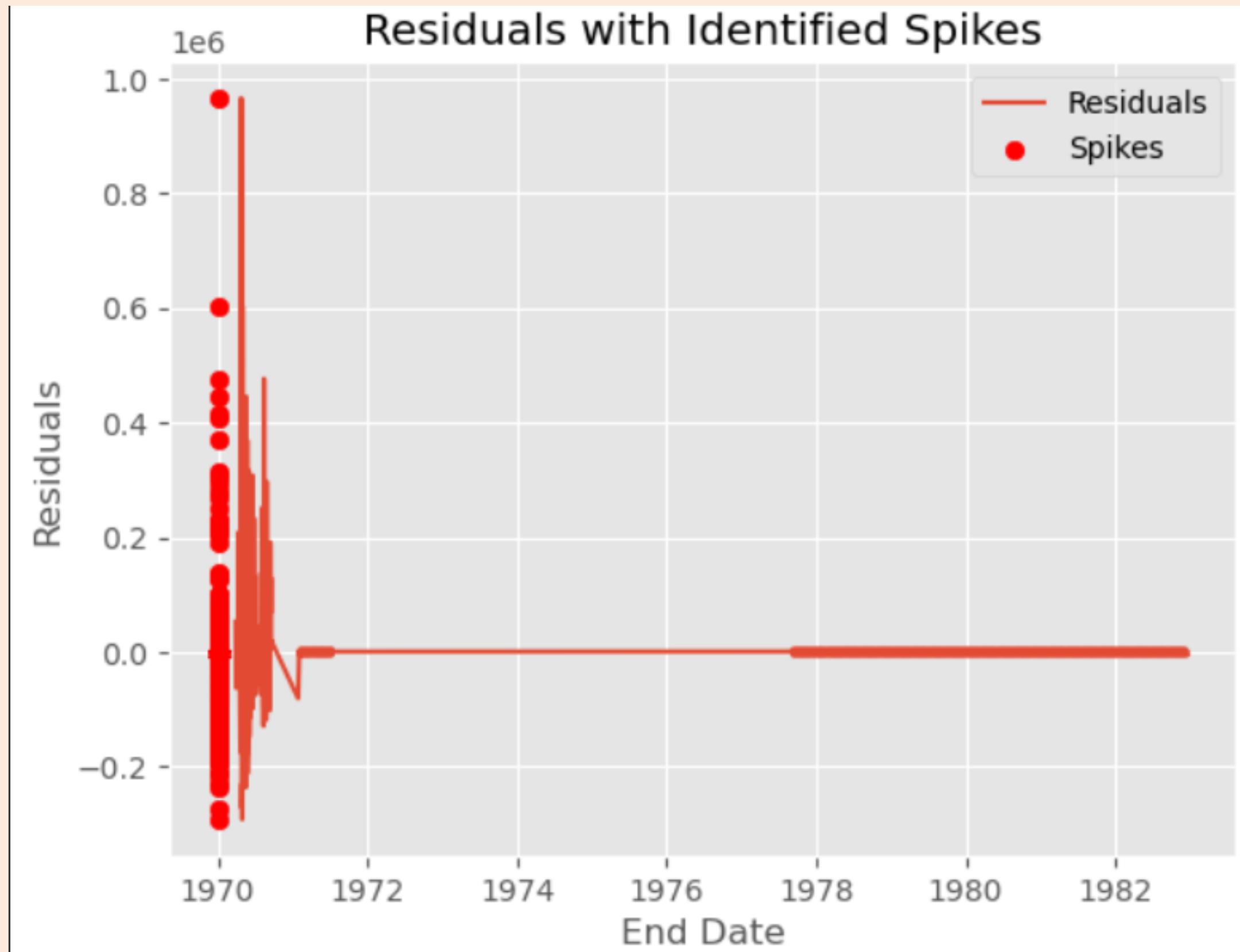
Future Steps

- 01.** Perform a Logistic Regression to predict Flood Severity
- 02.** Perform a Time Series Analysis on Human Fatalities and Animal Fatalities
- 03.** Perform NLP Processing to analyze Extent of Damage

Appendix

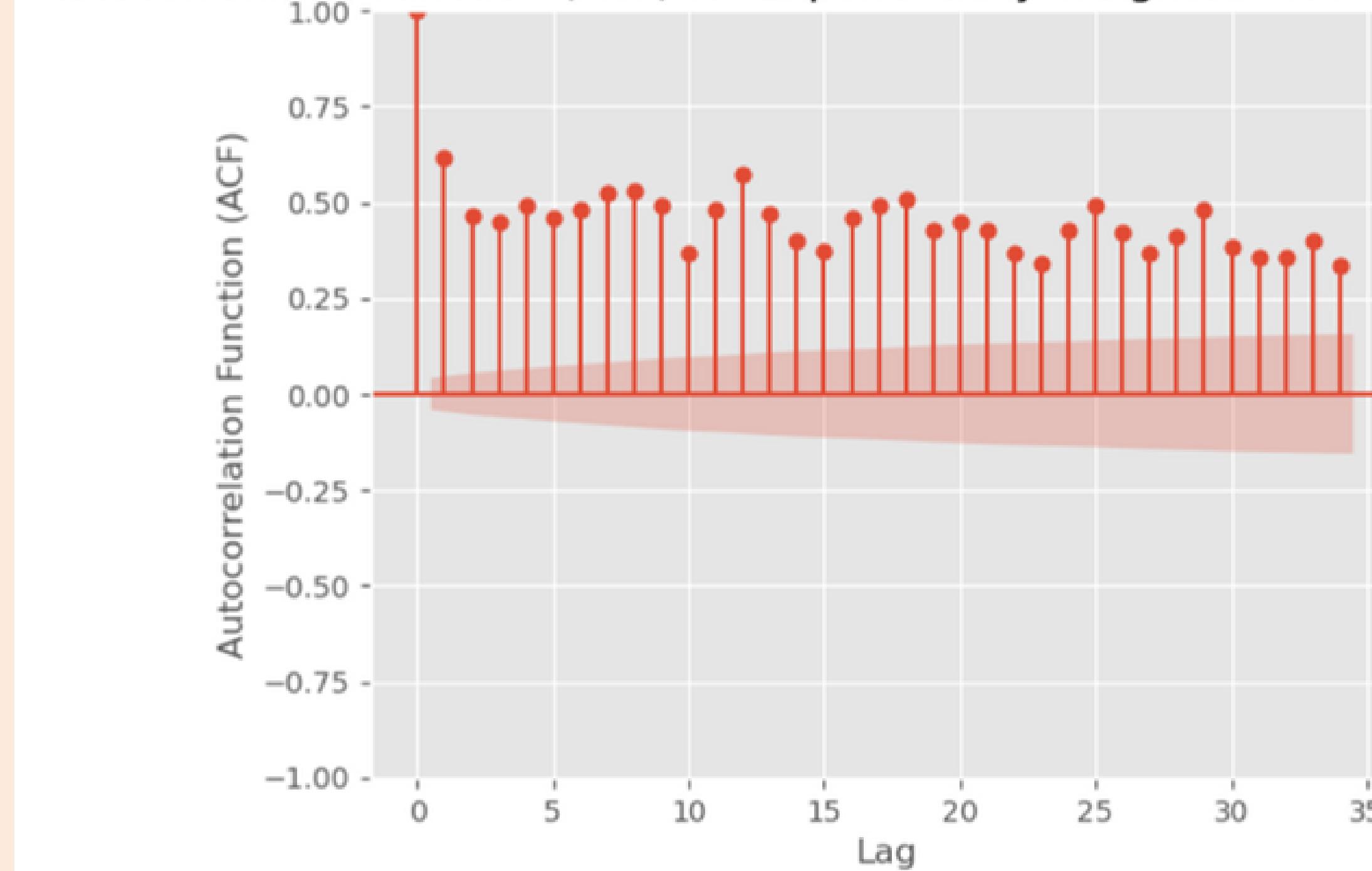


Seasonality Decomposition of Model



ACF Plot

Autocorrelation Function (ACF) for Exponentially Weighted Moving Average (EMA)



Websites Used

<https://www.cnn.com/2023/12/22/india/india-tamil-nadu-flood-rain-weather-intl-hnk/index.html>

<https://india.mongabay.com/2021/11/freely-available-geospatial-dataset-to-make-flood-research-easier/>

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**Thank you
for listening**