# Dispute Happened in India - Trends, Impacts, and Insights

Ajay A | Bhadri Raj T | Vyomika R
Dr. Pattabiraman V | SCOPE

## Motivation/Introduction

India's complex social and political fabric has led to various conflicts. Understanding these disputes their causes, frequency, and impact is essential for informed policymaking and peace efforts.

This project uses Exploratory Data Analysis (EDA) to uncover patterns in conflict data across India, aiming to highlight key trends, affected regions, and socio-economic impacts.

## SCOPE of the project

Analyze historical conflict data from various regions in India. Categorize conflicts by type: political, social, economic, etc. Identify temporal and geographical trends in conflict occurrences.

Examine the socio-economic impacts of conflicts. Use statistical tools and visualizations to draw meaningful insights. Support evidence-based policymaking and conflict mitigation strategies

## Methodology

The project started with Data Profiling to understand the structure and trends in the conflict dataset. Diagnosis Analysis helped identify root causes and key patterns.

Using Predictive Analysis, models were built to forecast future conflicts, supported by N-sampling for validation. Finally, Prescriptive Analysis was used to suggest actionable strategies for conflict resolution.

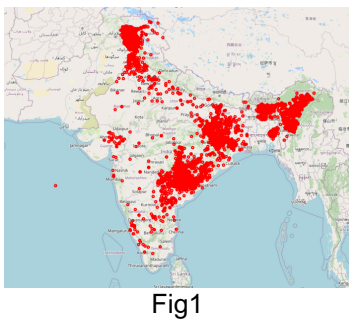

Fig1

**Conflict Density Map**
This map shows the spatial distribution of conflict incidents across India. Each red dot marks an event, revealing regional hotspots. It played a key role in identifying high-risk zones and guiding deeper diagnostic analysis.

**Suitable prediction model**
The XGBoost model delivered the most accurate results. After applying N-sampling techniques for fair comparison, XGBoost consistently outperformed the others in capturing both patterns and fluctuations. (Fig 2)

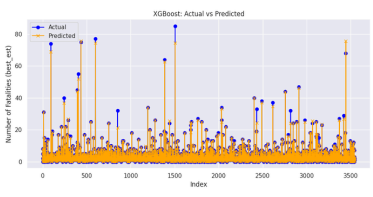


Fig 2

## Result

Table 1

Model Performance Comparison:

| | MSE | RMSE | MAE | R2 Score | MAPE |
|---|---|---|---|---|---|
| **Linear Regression** | 9.228889 | 3.037909 | 1.141893 | 0.609308 | 38.352684 |
| **Random Forest** | 0.265765 | 0.515524 | 0.045477 | 0.988749 | 0.267867 |
| **Gradient Boosting** | 0.161882 | 0.402346 | 0.102875 | 0.993147 | 1.852776 |
| **XGBoost** | 0.155386 | 0.394190 | 0.051437 | 0.993422 | 0.779786 |
| **ARIMA (Yearly)** | 47478.245279 | 217.895033 | 161.128160 | -0.948878 | 23.481315 |
| **SARIMA_1** | 36773.008754 | 191.762897 | 181.862545 | -8.512885 | NaN |
| **LSTM** | 0.018835 | 0.137240 | 0.114176 | -1.461182 | 59.545673 |
| **LSTM (Yearly)** | 316238.332156 | 562.350720 | 361.378019 | 0.482211 | 30.175591 |
| **Prophet (Monthly)** | 4460.114318 | 66.784087 | 54.500565 | -5.984998 | 126.618351 |

Table 3

Top 3 Models:

| Model | Total_rank |
|---|---|
| XGBoost | 9.000000 |
| Random Forest | 13.000000 |
| Gradient Boosting | 14.000000 |

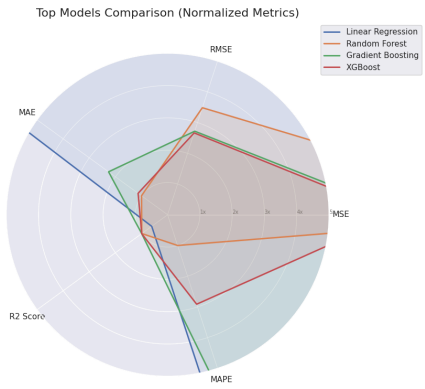


Fig 3

Factors that Reduce the Number of Fatalities due to Conflicts

Table 2

| Indicator | Correlation | Interpretation |
|---|---|---|
| Refugee Population (hosted) | -0.43 | Reflects international cooperation & humanitarian role |
| School Enrollment (Secondary) | -0.19 | Education reduces conflict vulnerability |
| Government Effectiveness | -0.20 | Strong governance leads to better conflict management |
| Arms Imports | -0.29 | Possibly used for deterrence, not internal escalation |

Best strongly correlates with battle deaths (r = 0.63), confirming data validity. Moderate links to arms exports and military spending suggest militarization may raise conflict risks. A slight link with young male population (r = 0.17) highlights the need for youth-focused policies.

## Conclusion / Summary

With the lowest RMSE and MAPE among all models, XGBoost proved to be the most reliable and robust, making it the final choice for this analysis.
Strengthening education, governance, and humanitarian efforts can significantly reduce conflict-related deaths and promote lasting peace.

## Contact Detail:

Ajay A 23MIA1121 - ajay.2023@vitstudent.ac.in
Bhadri Raj T 23MIA1029 - bhadriraj.t2023@vitstudent.ac.in
Vyomika R 23MIA1169 - vyomika.r2023@vitstudent.ac.in

## Reference / Acknowledgement

https://github.com/bhadri-Raj-T/eda_project