Predicting Severity of Impact from Conflict Events in Kenya

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Project Overview

- Development of a classifier model
  - Predict the severity of conflict events in Kenya
- Severity levels: Low, Moderate, High, Critical
- Goal: Support early humanitarian response and efficient resource allocation.

Business Understanding

- Conflict events vary widely in their impact.
- Timely response is difficult without tools to assess severity.
- Our model helps prioritize responses and minimize harm to communities.

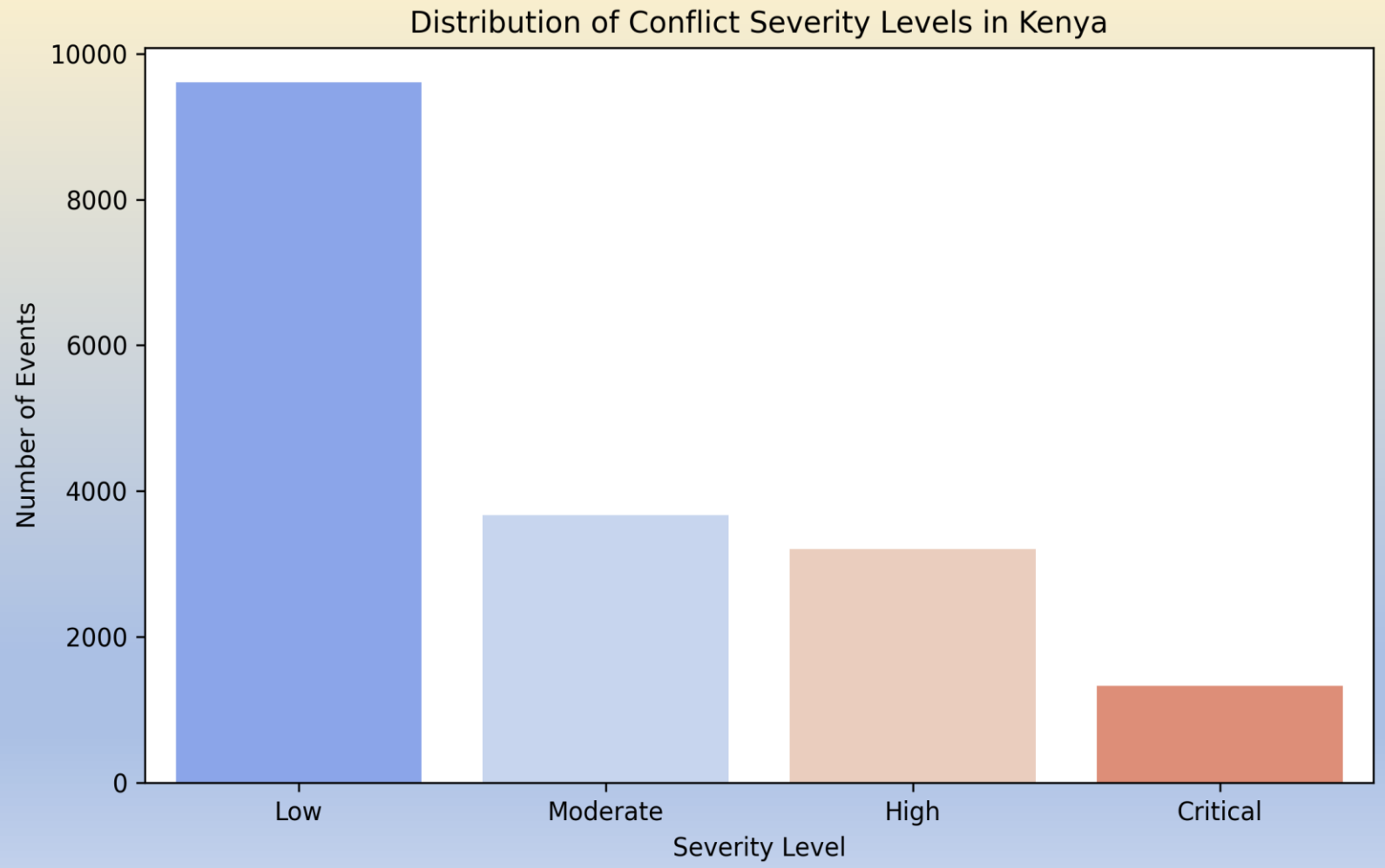
Data Overview

- Source: ACLED (Armed Conflict Location & Event Data Project)
- 17,800 conflict event records (1997-2025) from Kenya
- Features used: event date, location, actors, fatalities, and event type

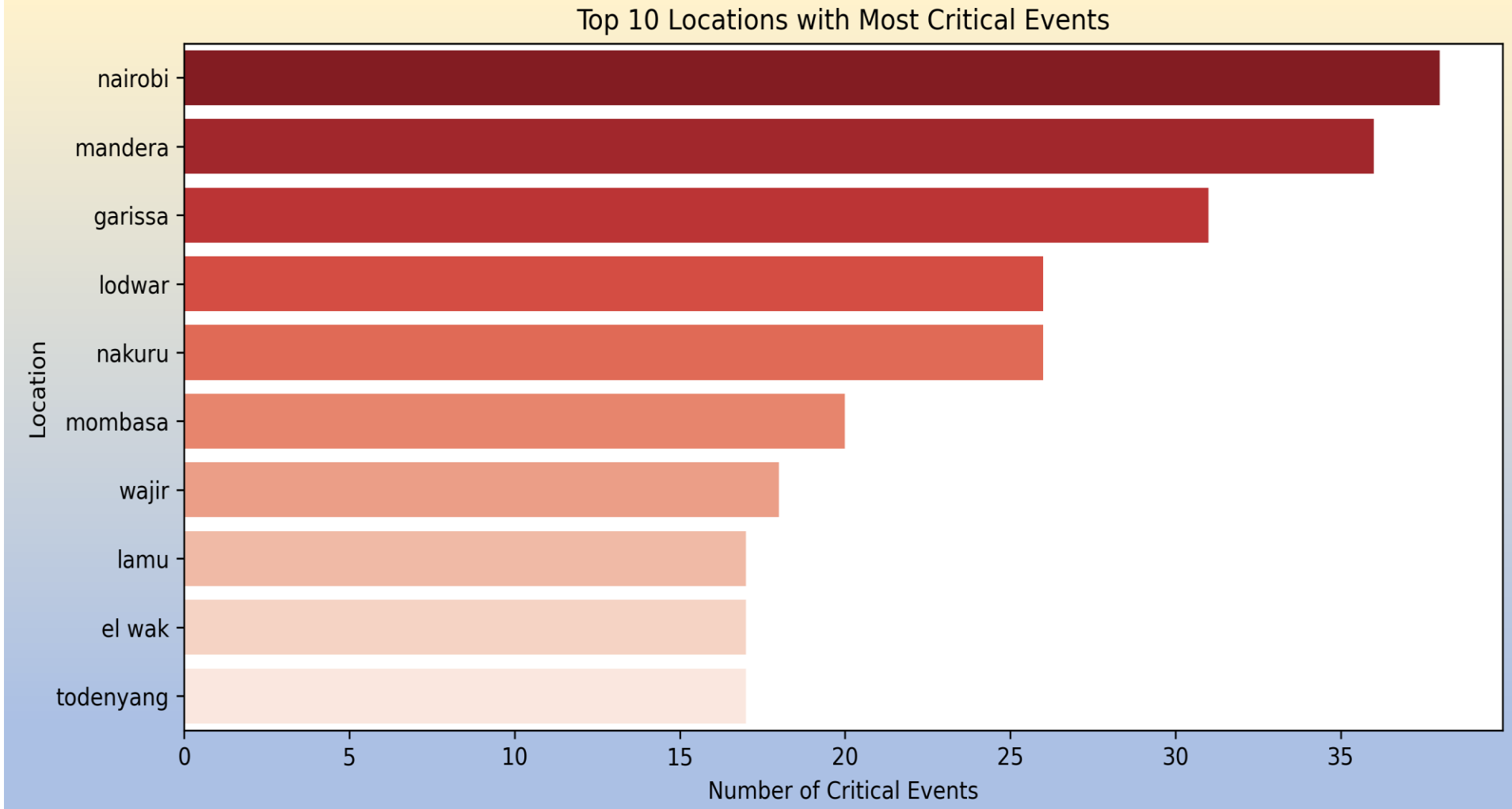
Data Preparation

- Cleaned and filtered records to remove noise
- Extracted key features (e.g., fatalities, region, actor types)
- Data Preprocessing
  - Standard Scaler
  - Encoding categorical data
- Performed class balancing using SMOTE

Distribution of Conflict Severity Levels in Kenya

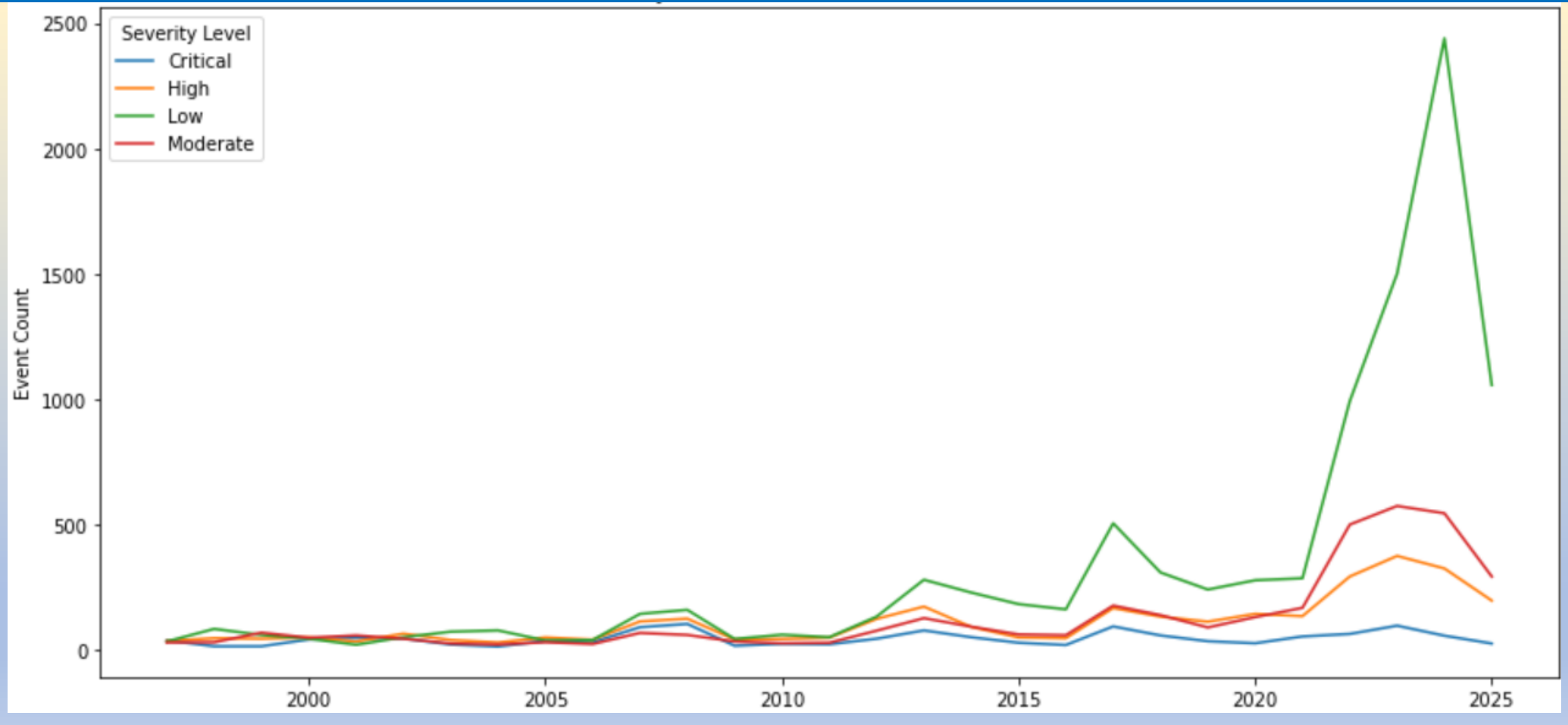


Top 10 Locations with Most Critical Events



- Nairobi, Mandera, Garissa

Severity Level Trends Over Time (1997–2025)



Modeling Approach

- Multi-class classification (4 severity levels)
- Models tested:
  - Logistic Regression –Baseline Model,
  - Random Forest,
  - XGBoost,
  - Ensemble Voting (Tuned)

- Final model: Voting Ensemble(Tuned)
- Ensemble and tune:
  - Logistic Regression, Random Forest, and XGBoost
- Metrics: Precision, Recall, Accuracy, F1-score, F2-score
- Recall of ‘Critical’ class – more significant

Model Performance

- Model Tuned to Maximize
  - Recall of **critical** severity conflicts
  - correctly identify them.

- Accuracy: 83%
- F1-score: 71%, F2-score: 71%

- Better balance of performance across all severity levels

Business Impact & Insights

- Enables faster response by humanitarian teams
- Improves resource prioritization for critical events
- Helps policymakers and planners anticipate escalation zones
- Supports long-term peace strategies through data trends

Next Steps

- Integrate model with live conflict data streams (e.g. APIs)
- Retrain periodically with new events
- Explore geospatial visualization and hybrid models

Appreciation

- **ACLED for access to conflict datasets**
- **Mentors, Moringa School, and Reviewers**

- **Questions? Let us know—we'd love to discuss further**

Thank you!