

Analyzing Africa's Conflict Landscape

Informing business investments through conflict analysis. Africa presents vast opportunities but also faces political instability.

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Overview

Business and Conflict Analysis

Understanding the intersection of business investments and conflict zones in Africa.

Data-Driven Insights

Leveraging data cleaning and visualisation techniques to get geographical insights.

Modelling and Deployment

Applying predictive modelling for informed decision-making and risk and risk mitigation.

Business Understanding

1

Market Entry

Understand the local market dynamics before investing.

2

Risk

Assess potential risks to ensure safe operations. Political instability can threaten investments.

3

Opportunity

Identify new opportunities for investment. Emerging markets offer high growth.



Problem Statement

1 Multinational Client

VMagic Leather, a multinational corporation, is looking to establish a new manufacturing plant in Africa. They require a location that offers long-term stability and minimal risk to their investment and operations.

2 Data Analysis

Extensive data analysis is required to pinpoint potential conflict hotspots across the continent. The analysis should also aim to forecast future events that could impact the stability of various regions, enabling proactive decision-making.

3 Risk Assessment

A comprehensive risk assessment model needs to be developed to evaluate the risks associated with different locations. This model will guide VMagic Leather's investment decisions by providing a clear understanding of potential challenges and opportunities.

Objectives

Dataset Exploration

Explore the dataset to gain familiarity with its structure, terminology, and quality by examining key variables, including numerical and categorical data.

Statistical and Predictive Analysis

Perform statistical and exploratory data analysis that includes correlation analysis, hypothesis testing, predictive modelling, and descriptive and exploratory analysis utilizing statistical measures

Conflict Analysis

Conduct a comprehensive conflict analysis in Africa by establishing a foundational understanding of conflict types, types, high-risk regions, and underlying causes

Map and Identification

Map and identify high-risk nations and areas to enhance early warning systems through geographic risk assessments.

Business Insights

Provide business insights for a multinational client to help identify conflict-free locations for a manufacturing facility by developing a predictive model to forecast conflict occurrences based on historical data





Data Understanding



ACLED Dataset

Real-time data on political violence and protests. The source of the data is <http://acleddata.com/about-acleddata/>



Global Network

Aggregates reports from local and regional media.



Comprehensive

Includes event details and contextual attributes.

The dataset contains 413,948 rows and 31 features, updated weekly.

Data Cleaning

1

Removed Irrelevant Columns

Dropped columns such as event_id_cnty, timestamp, notes, source, and tags to streamline the dataset and improve processing efficiency.

2

Redundancy

Eliminated redundant features like duplicated date entries and non-predictive predictive columns to reduce noise and prevent multicollinearity in the model.

3

Focus

Concentrated on key variables, including event type, location, fatalities, and actor details, to ensure the analysis remains targeted and relevant.

4

Handled Missing Values

Imputed or removed missing values in critical columns to avoid biases and errors and errors during the modeling phase, ensuring data integrity.



Data Visualization

Event Characteristics

Political violence, including battles and explosions, constitutes a significant portion of the events. Demonstrations and protests also play a crucial role in the conflict landscape.



Actors & Interactions

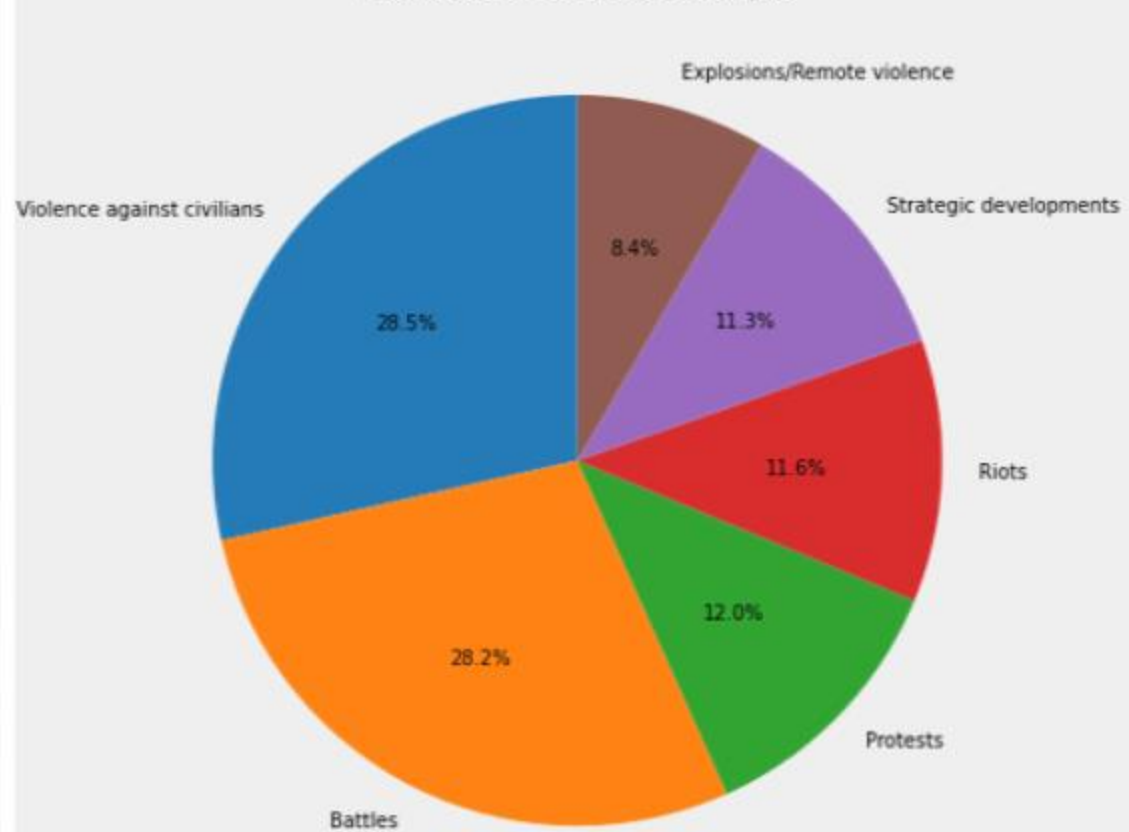
Key actors involved include Al-Shabaab, Shabaab, protesters, state forces, and various rebel groups. Interactions range from direct combat to protests and government responses.

Geographic Distribution

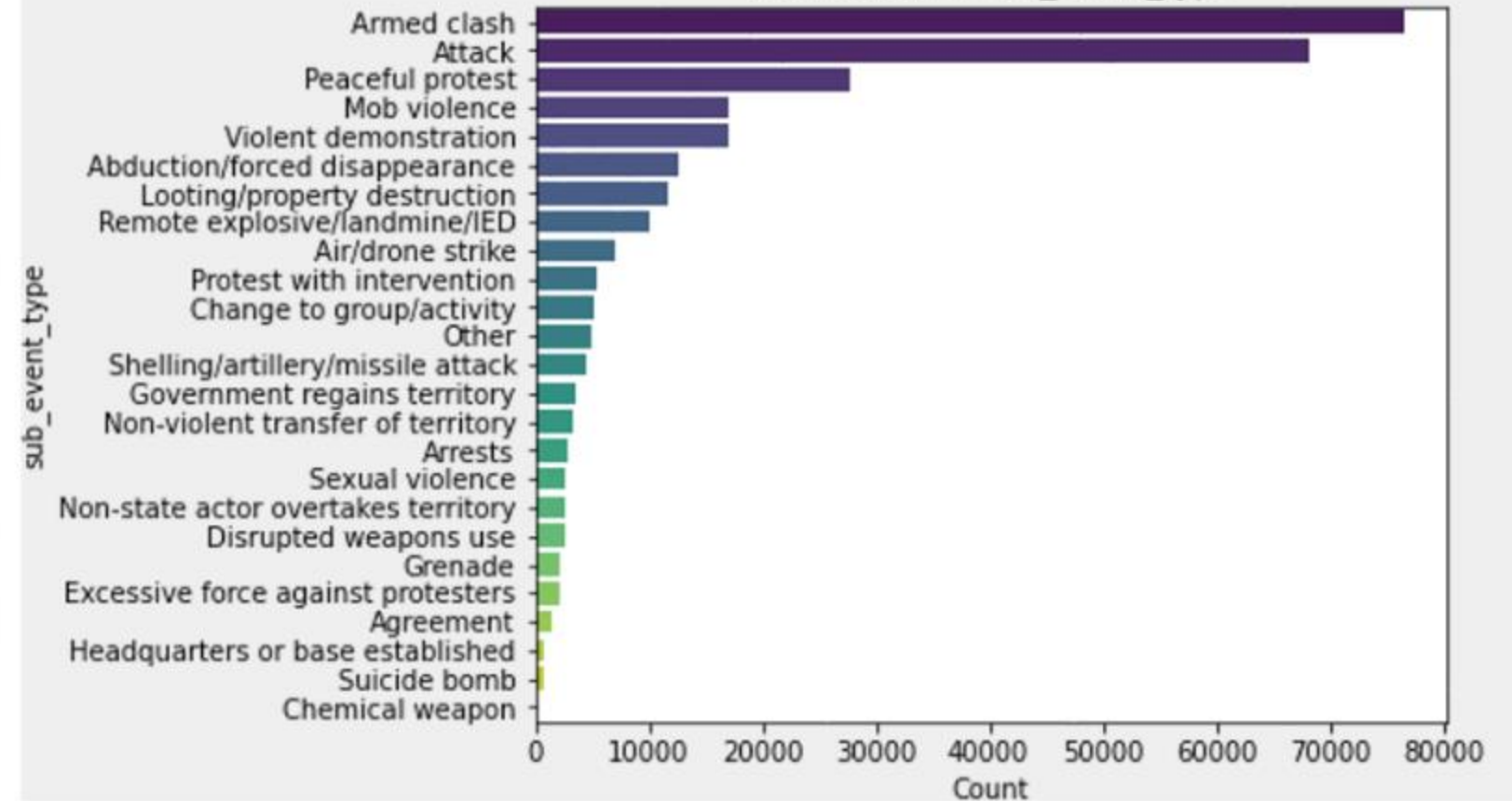
Eastern Africa, particularly Somalia, and Nigeria are the most affected regions. Other areas with notable conflict occurrences include the Sahel region and parts of Central Africa.

Distribution of Event Characteristics

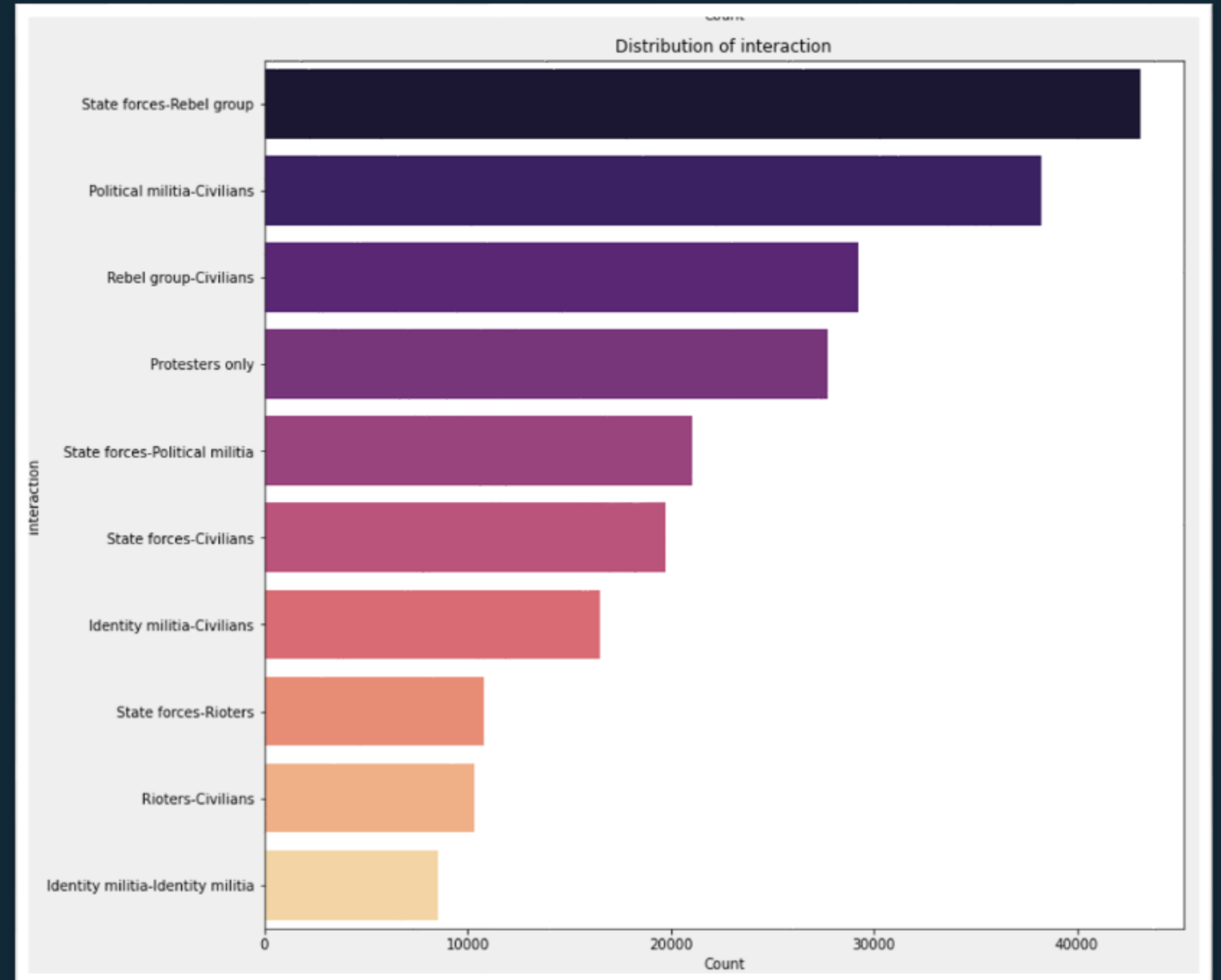
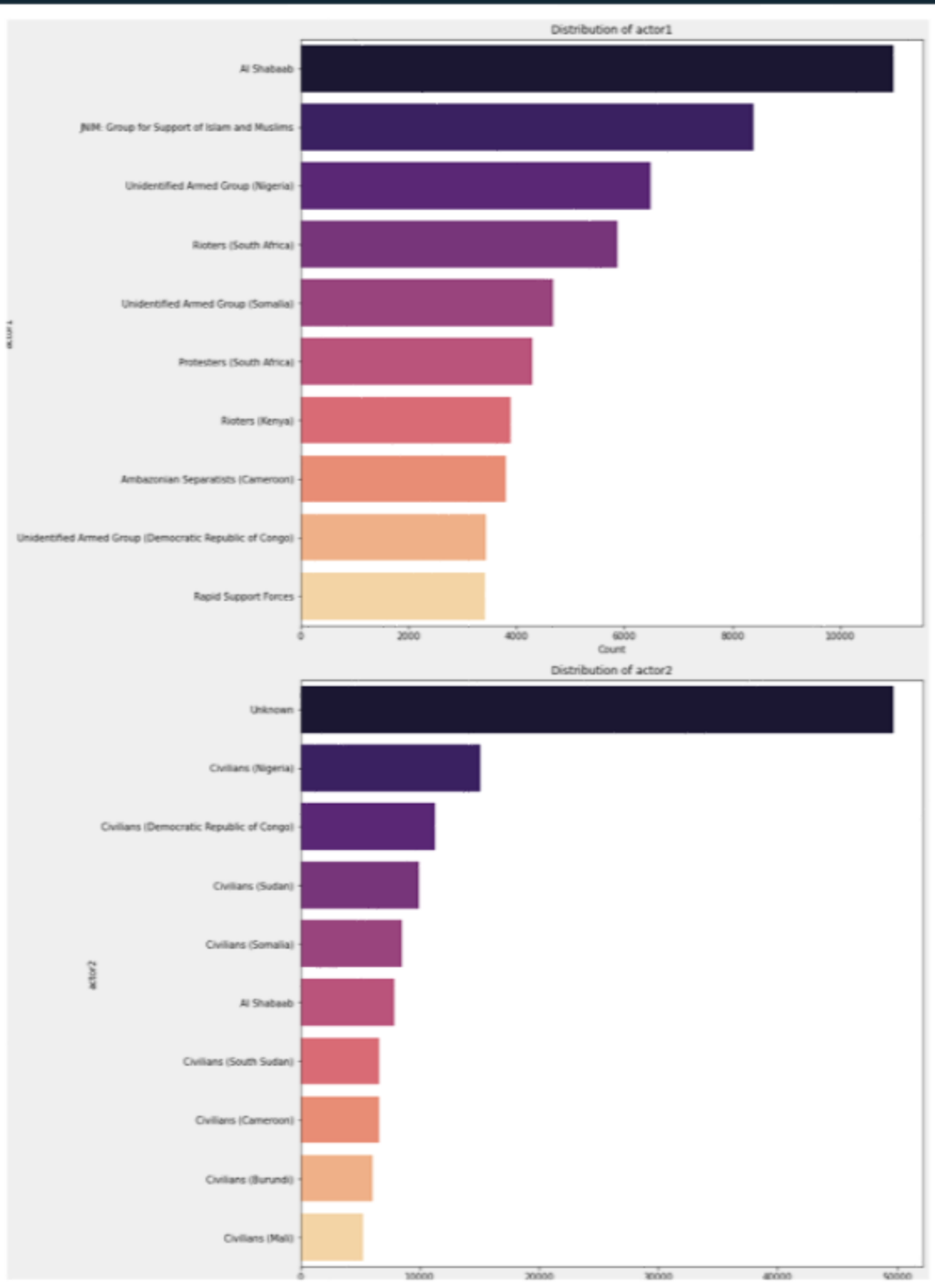
Distribution of Events by Event Type



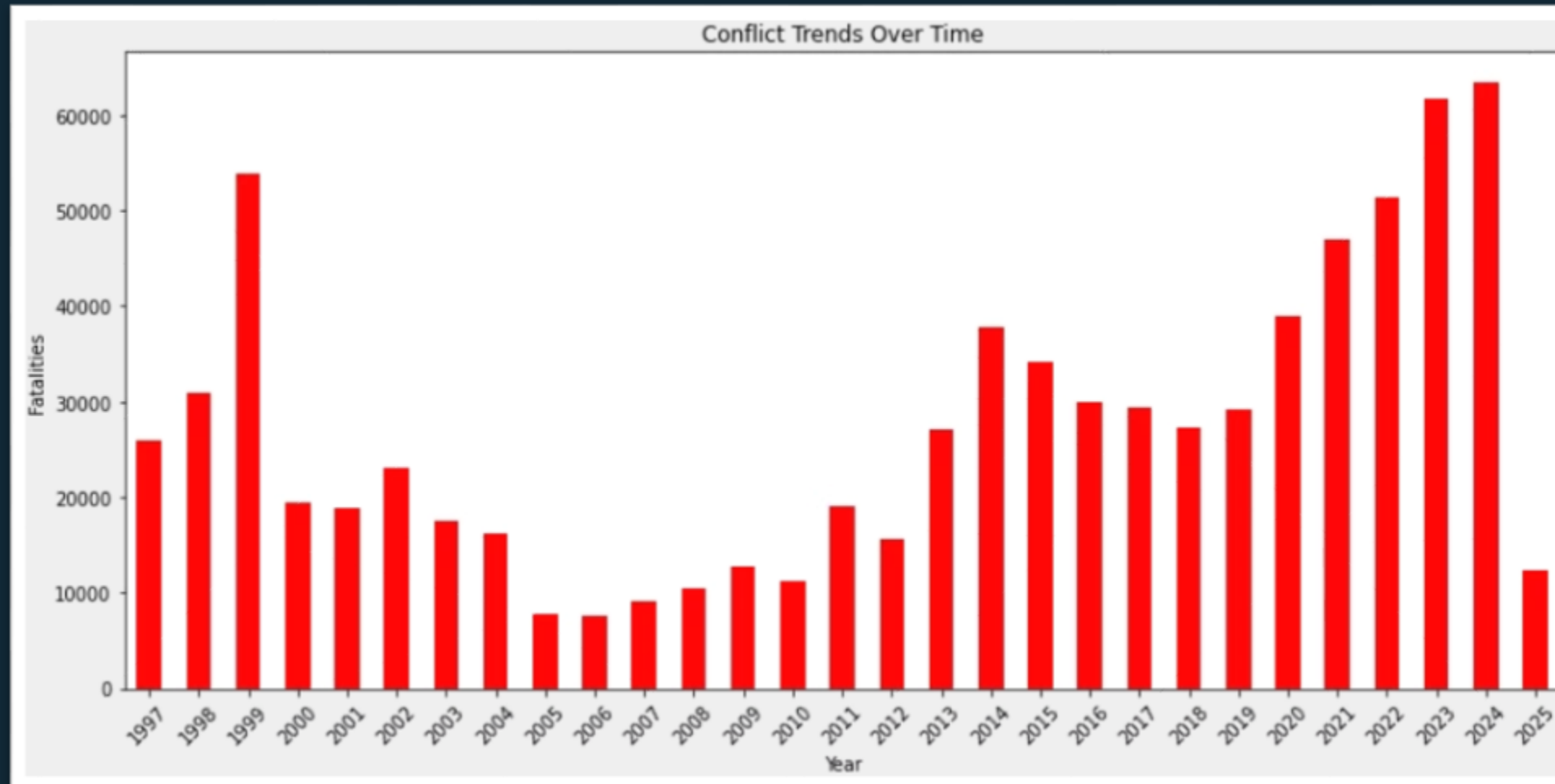
Distribution of sub_event_type



Distribution of Actors and Interactions

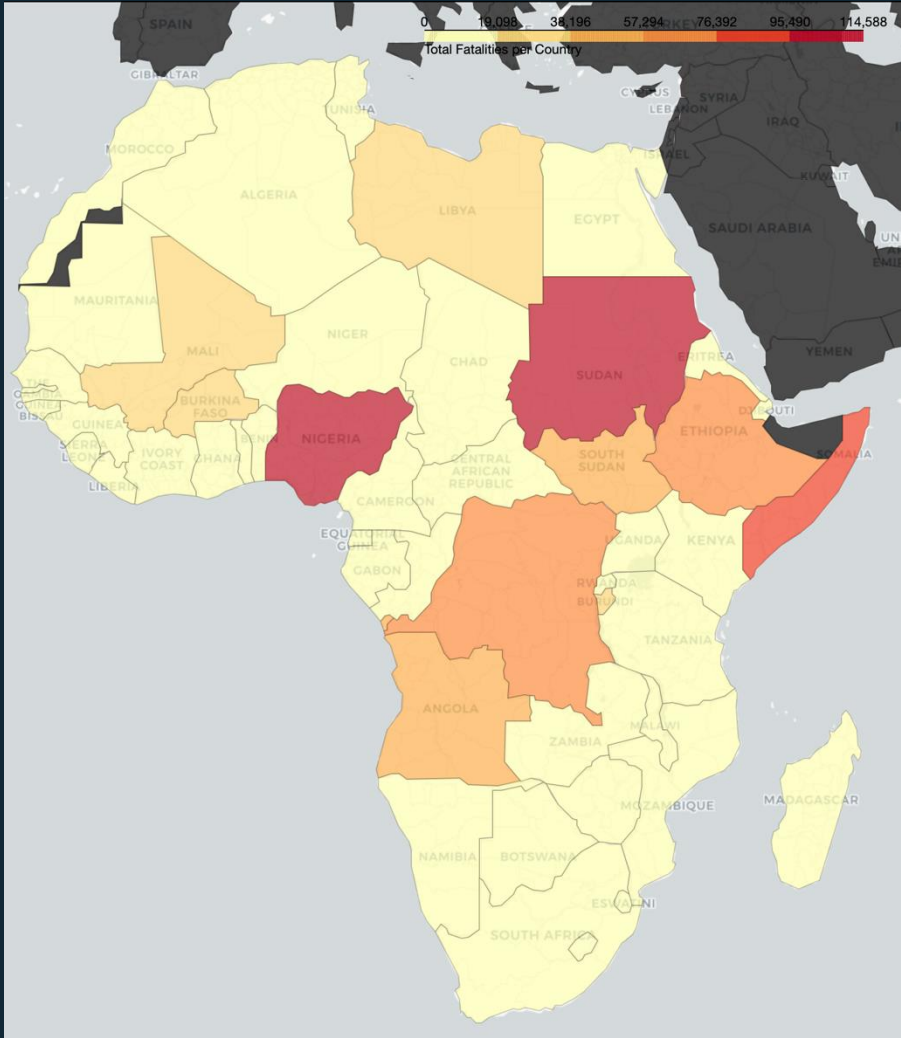


Conflict Trends Over Time

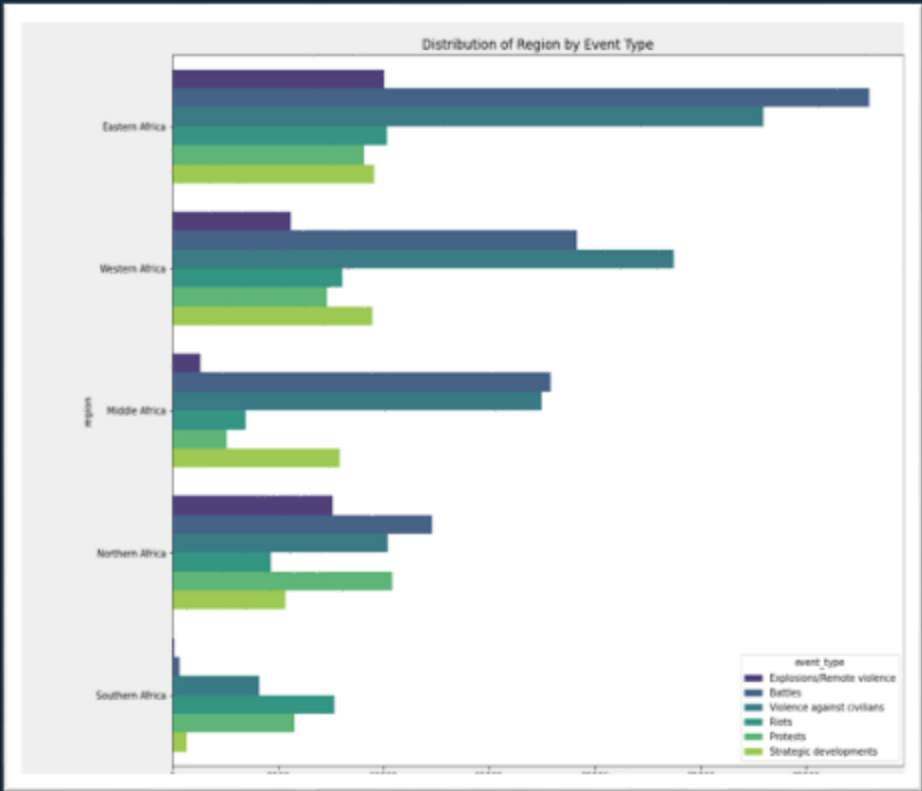


We can see that starting from the graph , graph , there was a noticeable increase in increase in conflict events in 2019 and 2020, potentially signaling escalating tensions or changes in the geopolitical environment. It is crucial for for stakeholders to closely monitor these these trends and adapt strategies accordingly to promote peace and stability stability in these regions.

Geographic Distribution of Conflict Zones



This map illustrates the concentration of conflict events across Africa. Key areas of concern include Eastern Africa, particularly Somalia, Somalia, and Nigeria, along with the Sahel region and parts of Central Africa. The varying intensities of color indicate the frequency



These regions are identified as the most affected areas, experiencing frequent political violence and demonstrations, with active involvement of groups like Al-Shabaab and state forces. The convergence of political, economic, and social factors in these areas has created a volatile environment, requiring targeted interventions to address the root causes of conflict and promote sustainable peace.

Eastern Africa



Experiences frequent political violence and demonstrations, often triggered by political instability, instability, ethnic tensions, and resource scarcity. The region is a hotspot for both state and non-state actors, state actors, leading to complex and prolonged conflicts.

Somalia



Identified as a high-risk area with active conflict events, events, including clashes between Al-Shabaab and government forces. The ongoing humanitarian crisis and crisis and weak governance structures exacerbate the the situation.

Nigeria



Faces political instability and demonstrations, impacting stability and economic development. Factors such as religious extremism, farmer-herder conflicts, and socio-economic inequalities contribute to the persistent unrest.

Modelling

1

XGBoost

Achieved an accuracy of 84.07% on the test dataset.

Demonstrated strong predictive power and robustness in handling complex relationships within the data.

2

Random Forest

Attained an accuracy of 83.93% on the test dataset.

Showed good performance and ability to generalize well across different subsets of the data.
the data.

3

Logistic Regression

Obtained an accuracy of 80.71% on the test dataset.

Provided a solid baseline performance with relatively simple and interpretable modeling approach.

Conclusion

Our conflict prediction model, leveraging XGBoost, achieved 84.07% accuracy. This strong predictive performance demonstrates its ability to classify conflict types based on historical data. The model can reliably identify patterns and relationships, making it a valuable tool for anticipating potential conflicts and enabling proactive decision-making.



Recommendations

84%

Accuracy

The XGBoost model achieved a high accuracy rate of 84.07% in predicting conflict. This allows for reliable identification of potential conflict zones.

1

Risk Mitigation

To minimize potential losses, it is advisable to avoid investing in areas identified as high-risk by the model. Consider delaying investments until stability improves.

2

Resource Allocation

Prioritize allocating resources to regions identified as safer and more stable by the model. This strategic allocation can lead to more sustainable and profitable ventures.

3

Early Warning System for Crisis Management

Implement an early warning system that leverages the model's predictive capabilities to detect potential crises. This will enable rapid response, preventing financial losses and maintaining a competitive edge.

Deployment

- The Africa conflict prediction system was deployed on render on render
- From the interface the user is required to input and submit submit the region and the country
- The output from the deployed web app is as follows:
 - Conflict risk levels
 - Probability of conflict
 - Type of conflict
 - Conflict Summary
 - Recommendation to the investor
- To access the prediction service follow the link below:
below:
[!\[\]\(6302aad5aed157b291fddf37b4870784_img.jpg\) Web_app link](#)



Call to Action

Invest in Africa to unlock significant opportunities. Your investments drive sustainable growth and stability.

Supporting local economies creates jobs and fosters innovation. Together, we can build a prosperous future for Africa.

1 Economic Growth

Fuel Africa's expanding markets by investing in key sectors such as technology, infrastructure, and renewable energy, which are poised for exponential growth.

3 High Returns

Benefit from emerging market potential by capitalizing on the increasing consumer base, resource-rich environment, and strategic location for global trade, offering substantial returns on investment.

2 Social Impact

Drive positive change in communities by supporting education, healthcare, and sustainable agriculture initiatives that improve livelihoods and promote inclusive development.



Thank You

Thank you for considering our conflict analysis. We offer support for strategic strategic investment decisions. This aims to mitigate risk and promote stability promote stability in Africa.

Our insights enable informed and responsible investments. Together, we can Together, we can drive economic growth and foster lasting peace. This will This will create a prosperous future for all.

