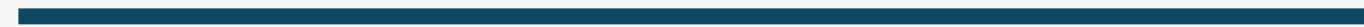Prepared by group 5

Group Project

Introduction

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our project uses data analysis and visualization in Tableau to explore crop yields, production, and population across Karamoja. By comparing maize and sorghum performance, we aim to identify trends, highlight vulnerable areas, and propose recommendations to improve food security

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Background of the Project

Current scenario:

Karamoja, in northeastern Uganda, is one of the most food-insecure regions in the country. Frequent droughts, low crop productivity, and pest outbreaks threaten household food security. Maize and sorghum are the main staple crops, but their performance varies across subcounties and districts.

how did we study the project ?

"We combined shapefiles, crop production data, and population data. Using Tableau, we built maps, bar charts, combo charts, and heatmaps to visualize yield differences and production patterns. We also created calculated fields, filters, and interactive dashboards for deeper analysis.
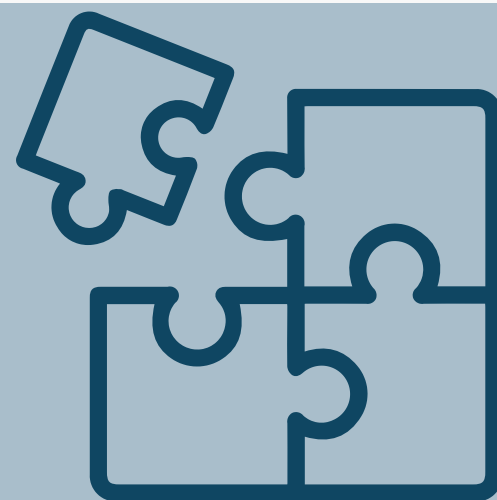
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Project Objectives

Analyze crop performance
- Compare maize and sorghum yields and production across districts and subcounties in Karamoja.

Identify patterns and disparities
- Use visualizations (maps, heatmaps, combo charts) to highlight high- and low-yield areas.

Develop actionable insights
- Provide recommendations to improve crop productivity and strengthen food security..

key findings

"Our analysis of sorghum and maize production in Karamoja shows that sorghum generally performs better under drought, while maize has inconsistent yields. Population pressure is highest in certain subcounties, increasing the need for targeted support. Crop areas vary widely, which affects food security in the region."

RECOMENDATIONS

Invest in Sorghum for Stability

- Sorghum performs better and is more reliable than maize people in karamoja should focus resources for example seeds and fertilizers on high-yield sorghum areas to boost food security.

Upgrade maize productivity through targeted interventions

- Investors should focus on specific low-performing subcounties and Introduce drought-tolerant maize varieties and improve irrigation, to close the yield gap and improve food security

Target High-Population Subcounties with Balanced Crop Strategies

- Focusing resources on densely populated subcounties with low food security ensures ensures more families get enough food suply

Strengthening Food Security and Resilience in Karamoja

By prioritizing sorghum investment, improving maize support, and focusing on population-dense subcounties, Karamoja can move toward improved food security and resilience.

FUTURE WORK

1. Climate–Crop Linkages
- Merge yield data with rainfall and temperature records to explain year-to-year variation.

2. Soil & Inputs Data
- Explore how soil fertility, fertilizer use, and irrigation access drive productivity gaps.

3. District Comparisons
- Scale analysis to other Ugandan regions to identify national-level yield patterns.

4. Predictive Analytics
- Build models to forecast crop yields under different climate and population growth scenarios.

5. Food Security Index
- Combine yields, population, and consumption data into a single index to track vulnerability.

Conclusion

Our analysis of crop yields in Karamoja reveals three clear insights:

- Sorghum consistently outperforms maize in both yield and resilience, confirming its role as the region's drought-tolerant staple.

- Maize production lags behind, especially in subcounties with weaker infrastructure and limited access to irrigation.

- Yield patterns vary strongly across districts and subcounties, showing that interventions must be location-specific rather than uniform.

These findings point to a simple truth: data-driven crop planning can directly improve food security in Karamoja. By building on sorghum's strengths, closing gaps in maize production, and targeting support where it is most needed, investors can create a more sustainable and resilient agricultural system.

Thank you

presented by group 5