BURUNDI AGRICULTURAL
PRODUCTIVITY ANALYSIS (2000–2023)

Final Exam Project Report | August 2025

PROJECT BACKGROUND

Burundi’s agricultural sector is the backbone of its economy, engaging over 90% of the population in farming activities and contributing a significant share to the country’s GDP. Despite its importance, productivity remains low due to challenges such as land fragmentation, soil degradation, and limited access to modern technologies

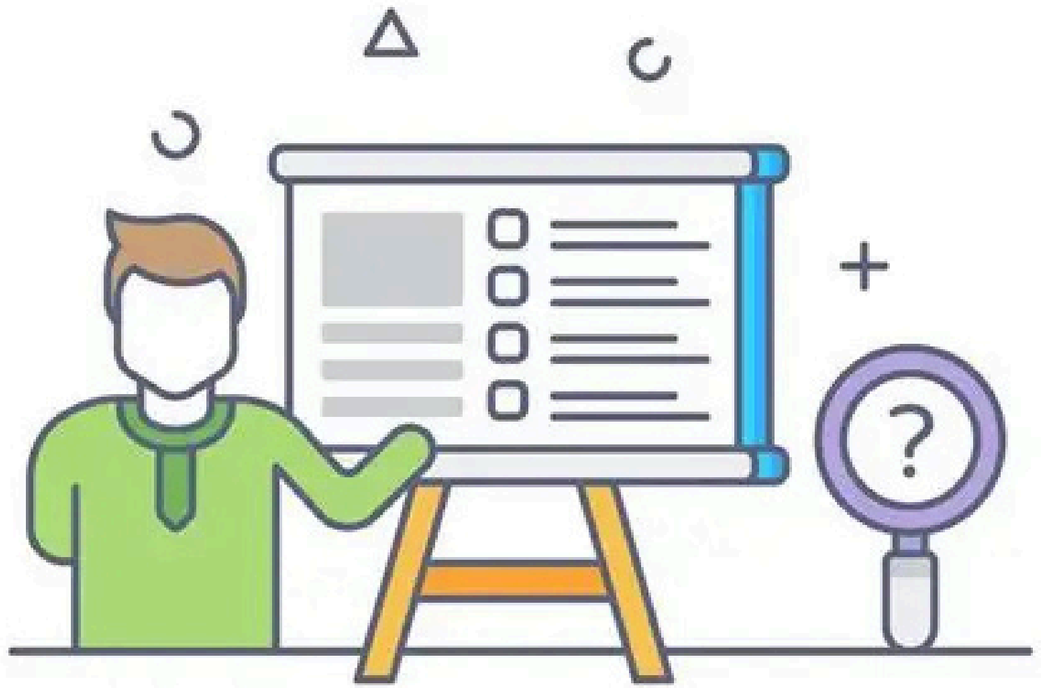
This project aims to analyze agricultural productivity trends in Burundi from 2000 to 2023, with the goal of uncovering patterns, drivers, and opportunities for evidence-based interventions to improve food security and livelihoods.

PROBLEM STATEMENT & OBJECTIVES

Burundi faces persistent agricultural productivity challenges, including wide yield gaps, limited data utilization, and low access to modern inputs. These challenges hinder strategic planning and sustainable development in the sector.

Objectives:

- Analyze crop production trends from 2000 to 2023
- Identify key drivers affecting productivity
- Provide actionable insights to support data-driven agricultural planning and policy



Problem Statements

METHODOLOGY OVERVIEW

Data Sources:

- FAOSTAT agricultural datasets (Crops Primary, Livestock Primary)
- Supplementary local records (if available)

Tools Used:

- Python (for data cleaning and analysis)
- Power BI (for dashboard visualization)

Workflow:

- Data Collection
- Data Cleaning and Preprocessing
- Exploratory Data Analysis (EDA)
- Visualization and Dashboard Design in Power BI

DATA PREPARATION

Raw Data Description:

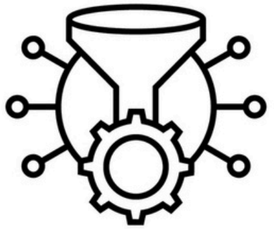
- Agricultural production data from FAOSTAT (2000–2023)
- Included variables: crop names, production quantity, area harvested, yield, year

Cleaning Steps:

- Removed duplicates and blank values
- Filtered for Burundi only
- Standardized column names and data types
- Converted units where necessary

Final Dataset Variables:

- Crop
- Year
- Production (tons)
- Area harvested (hectares)
- Yield (tons/hectare)



Data Preparation

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Data cleaning completed successfully.

Cleaned data shape: (18179, 7)
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	Country	Crop	Year	Value_area	Value_yield	Value_production	Yield_per_area
0	Burundi	Bananas	2000-01-01	273050.0	5544.8	1513997.0	0.020307
1	Burundi	Bananas	2001-01-01	300000.0	5163.9	1549164.0	0.017213
2	Burundi	Bananas	2002-01-01	300000.0	5343.3	1602979.0	0.017811
3	Burundi	Bananas	2003-01-01	310437.0	5669.2	1759917.0	0.018262
4	Burundi	Bananas	2004-01-01	300000.0	5288.5	1586536.0	0.017628

EXPLORATORY DATA ANALYSIS

Summary Statistics:

- Mean, median, and range of production, area, and yield
- Most frequently produced crops identified

Initial Visualizations:

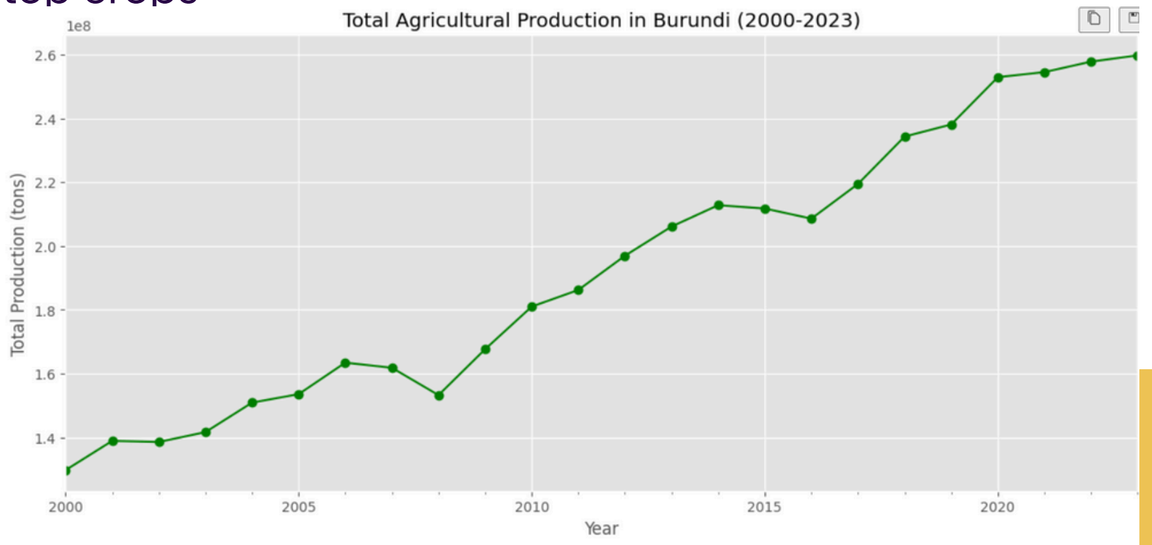
- Line charts for yearly production trends
- Bar charts comparing crop production volumes
- Scatter plots showing yield vs. area harvested

Observed Trends or Anomalies:

- Fluctuating production levels across years
- Sharp yield drops in certain years (possibly due to drought or policy shifts)
- Maize and bananas consistently among top crops

Summary Statistics:

	Value_area	Value_yield	Value_production	Yield_per_area
count	1.817900e+04	18179.000000	1.817900e+04	1.817900e+04
mean	8.414358e+04	6662.966797	2.541628e+05	inf
std	2.832308e+05	11097.722454	8.456219e+05	NaN
min	0.000000e+00	11.100000	2.000000e-01	1.657225e-04
25%	5.500000e+02	883.550000	1.550000e+03	4.663048e-02
50%	4.796000e+03	3333.300000	1.287696e+04	6.471500e-01
75%	4.139450e+04	7980.400000	9.619600e+04	7.617747e+00
max	4.400000e+06	121648.600000	1.175644e+07	inf



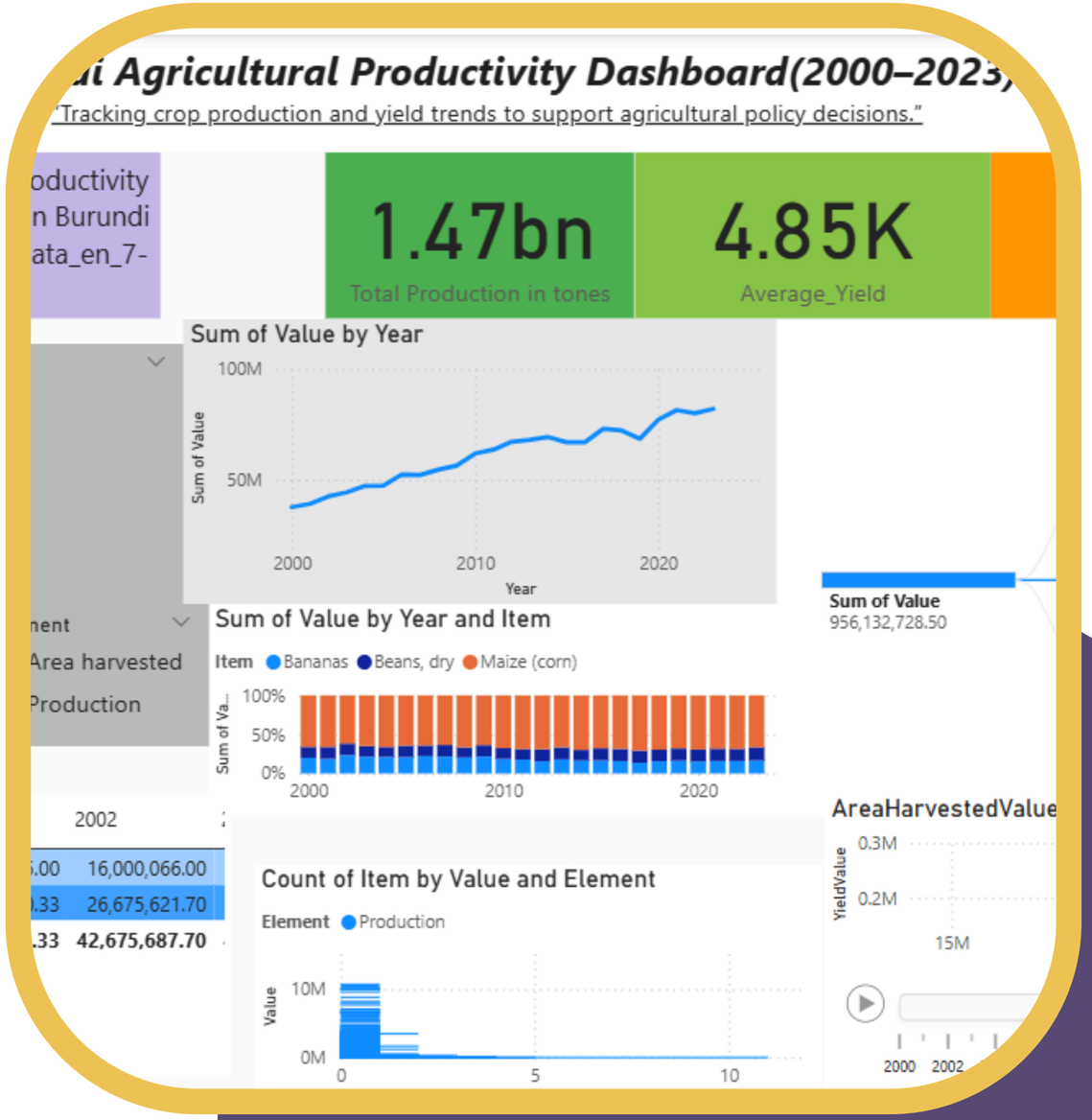
DASHBOARD DESIGN

Power BI Visuals:

- Line Charts – to display production trends over time
- Bar/Stacked Column Charts – to compare crop outputs and harvested area
- Decomposition Tree – to explore key factors influencing production

Slicers for Interactivity:

- Crop Selector – view data for a specific crop
- Year Range – analyze data between 2000–2023



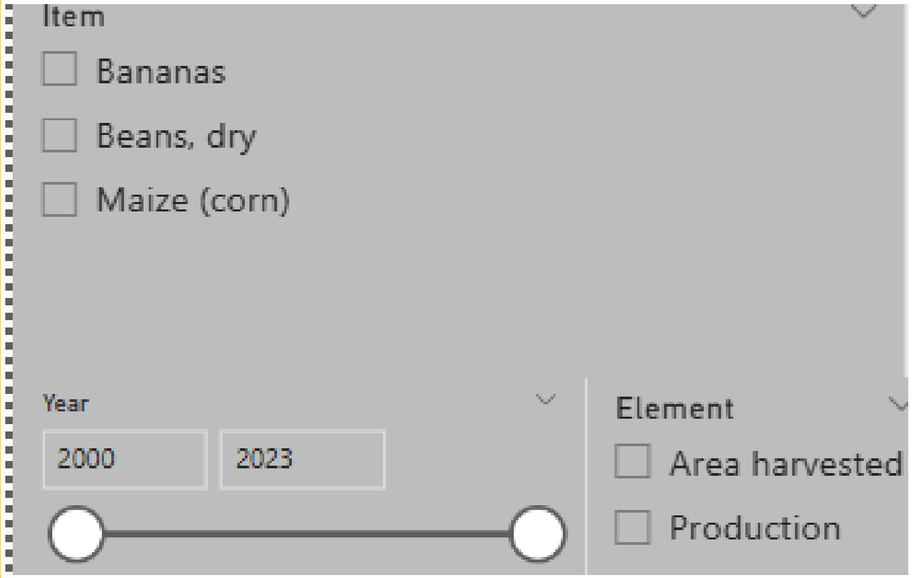
PRODUCTION TREND RESULTS

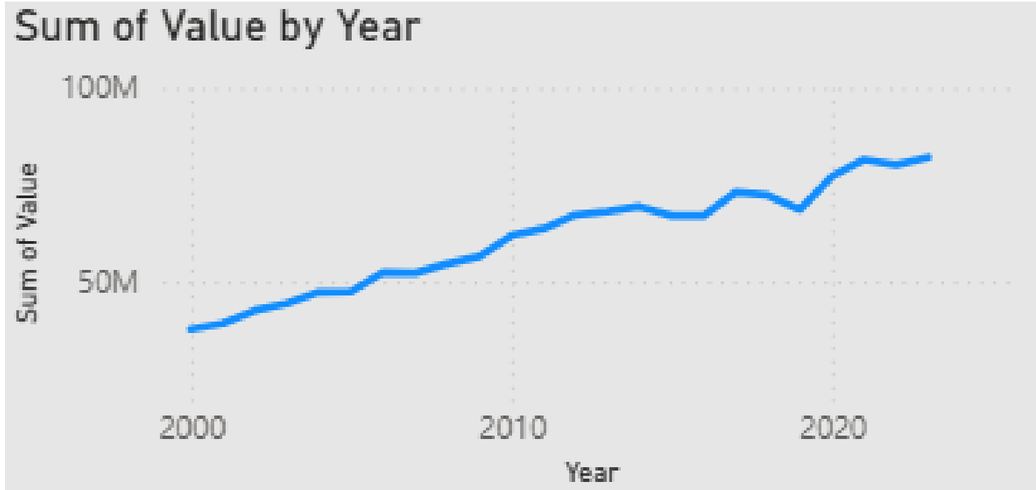
Line Chart Findings:

- Clear upward or downward trends observed in key crops over the years
- Seasonal or year-on-year fluctuations in output

Key Patterns:

- Certain crops (e.g., Maize, Bananas) show consistent growth
- Production dips align with known climatic or policy events





YIELD & AREA ANALYSIS

Crop Yield Comparison:

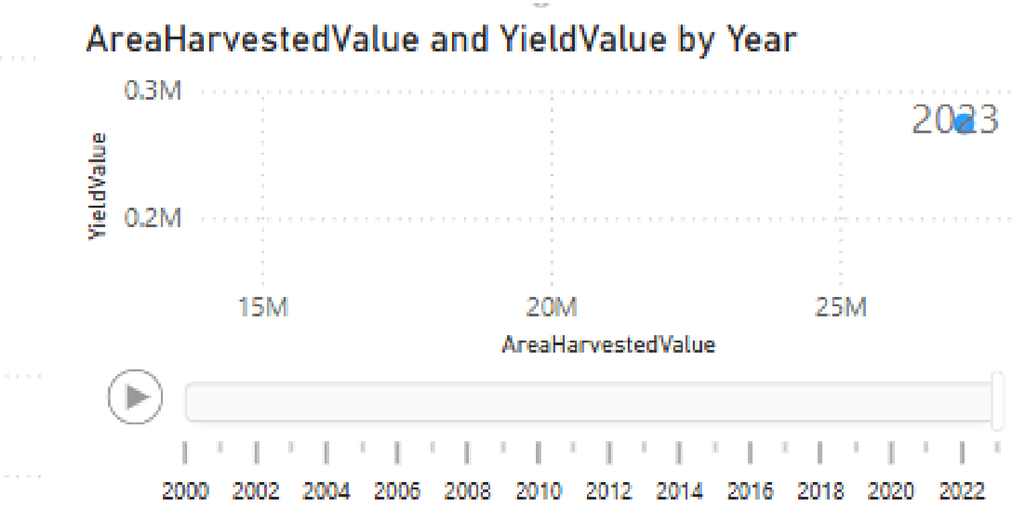
- Variations in yield across different crops
- Notable high-yield crops (e.g., rice, cassava)

Area Harvested Changes:

- Fluctuations in total area under cultivation over the years
- Shifts in crop priorities (e.g., decline in wheat area, rise in maize)

Insights:

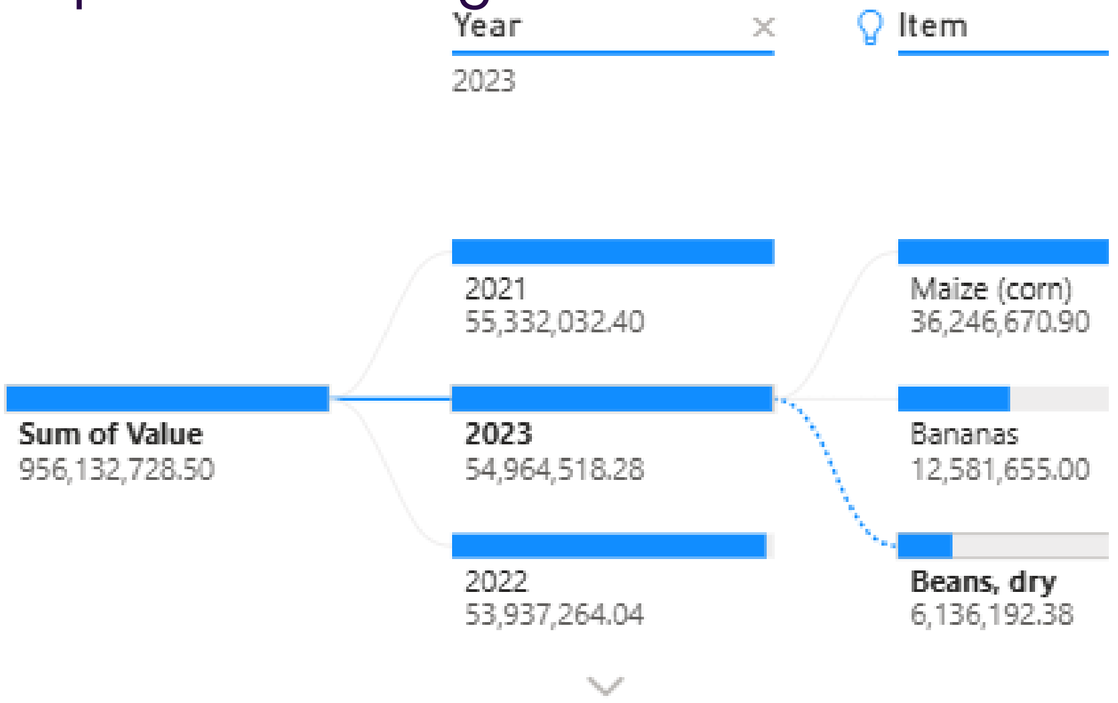
- Yield improvements not always tied to expanded area
- Potential for optimizing existing farmland through best practices



DECOMPOSITION TREE INSIGHTS

Factors Influencing Production:

- The decomposition tree helped break down total production by:
  - Crop type
  - Year
  - Element (e.g., yield, area)
- It revealed key drivers like high-yield crops contributing most to overall production.



RECOMMENDATIONS

Insights for Policy or Stakeholders:

- Focus on improving yields for underperforming crops.
- Encourage investment in crops with strong growth and efficiency trends.
- Strengthen data collection and reporting at the regional level.

Suggested Interventions:

- Provide targeted training for farmers on modern techniques.
- Invest in irrigation and sustainable farming infrastructure.
- Develop region-specific support programs to address yield gaps.

FUTURE WORK

- Collect Regional Data

- To enable geographic comparisons and map-based insights, future efforts should focus on gathering data at the provincial or district level in Burundi.

- Include Seasonal Data

- Incorporating monthly or seasonal agricultural data will allow for finer-grained trend analysis and better planning for planting and harvesting cycles.

- Add Livestock Metrics

- To create a more comprehensive view of the agricultural sector, future analyses should also integrate livestock production, yield, and distribution data.

CONCLUSION

Recap of Achievements

This project successfully analyzed Burundi's agricultural productivity using FAO data, developed a cleaned dataset, and presented key insights through an interactive Power BI dashboard.

Final Remarks

The analysis highlights both challenges and opportunities in the sector, offering data-driven insights to guide future policy and planning for sustainable agricultural growth.

THANK YOU

Thank you for your attention and interest in this project.

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- **August 2025**
- **For: Burundi Agricultural Productivity Analysis**

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