Global Food Production Trends and Analysis (1961-2023)

A Comprehensive Study Using Power BI

Milestone 1: Data Collection

It focuses on gathering and understanding the dataset for analysing global food production trends from 1961 to 2023. The dataset, sourced from Kaggle, contains production data for key commodities like rice, wheat, maize, apples, bananas, coffee, and more, categorized by country/region and year.

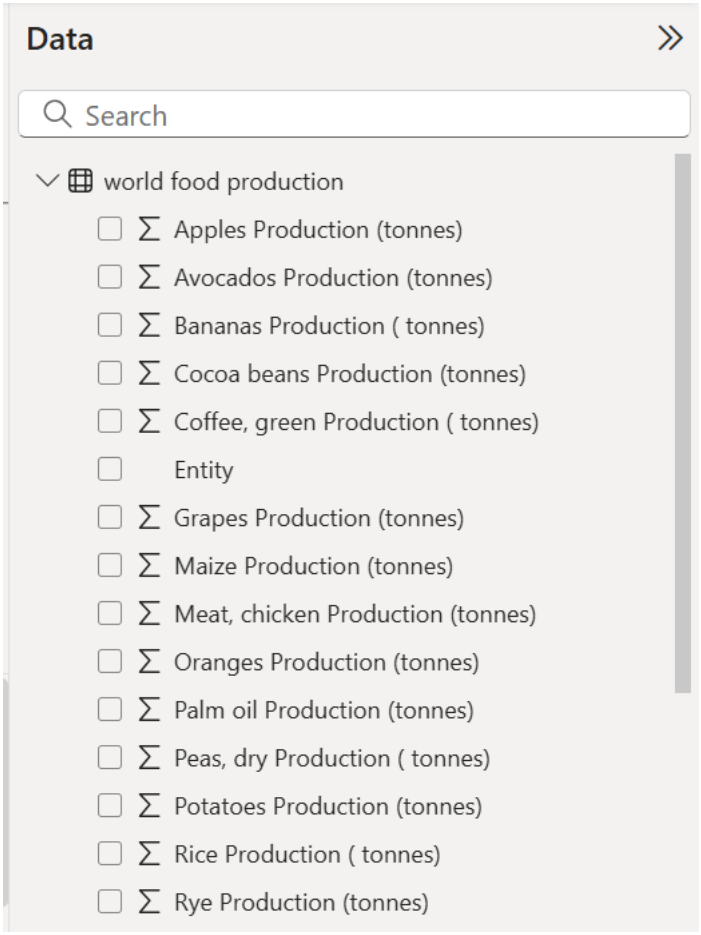

Fig.1: Dataset

Milestone 2: Data Preparation

Data Loading

The dataset is loaded into Power BI using "Get Data" → "Text/CSV" → "Load", ensuring all relevant columns are correctly imported for analysis**.**

Data Cleaning Process

1. Handling Missing Values:

- Checked for any null or missing values in the dataset.

- **Removed 0s in the Rice Production column** to eliminate inaccurate data points and ensure reliable analysis.

2. Data Type Corrections:

- Ensured that all numerical columns, such as rice, wheat, maize, and fruit production, were in the correct numeric format.
- Adjusted any incorrect data types, such as changing text columns mistakenly stored as numbers.

3. Formatting to Whole Numbers:

- Since production data is measured in tonnes, values were formatted as whole numbers to ensure consistency.
- Decimal places were removed to improve readability and maintain accurate reporting.

This cleaning process ensures that the dataset is accurate, structured, and ready for visualization in Power BI.

Milestone 3: Data Visualization

Phase 1: Sum of Rice Production (tonnes)

- The global rice production reached **269 billion tonnes** from 1961 to 2023.
- The visual representation highlights the importance of rice as a staple food worldwide.
- The steady rise in rice production indicates increased agricultural efficiency, demand, and improved farming practices.
- The major rice-producing countries include China, India, Indonesia, and Bangladesh.

Fig.2:Sum of Rice Production(tonnes)

Phase 2: Sum of Wheat Production (tonnes)

- Wheat is one of the most significant food grains, with **282 billion tonnes** produced over the analysed period.

- This production trend highlights wheat's role in global food security and widespread cultivation.
- Regions with the highest wheat production include China, India, the United States, and Russia.
- Wheat production has grown consistently, driven by technological advancements, better irrigation techniques, and increased demand.

Fig.3:Sum of Wheat Production(tonnes)

Phase 3: Sum of Tea Production (tonnes)

- The **total tea production** reached **2 billion tonnes** globally.
- The gauge chart highlights the scale of tea production relative to other crops.
- The top tea-producing countries include China, India, Kenya, and Sri Lanka.
- The demand for tea remains strong due to its cultural significance and increasing global consumption.

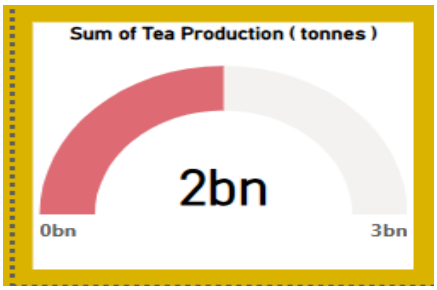

Fig.4:Sum of Tea Production(tonnes)

Phase 4: Sum of Coffee, Green Production (tonnes) by Entity

- **Africa is the leading producer** of **green coffee**.
- The bar chart shows the distribution of coffee production across different continents.
- Other major coffee-producing regions include South America (Brazil, Colombia), Asia (Vietnam, Indonesia), and Central America.

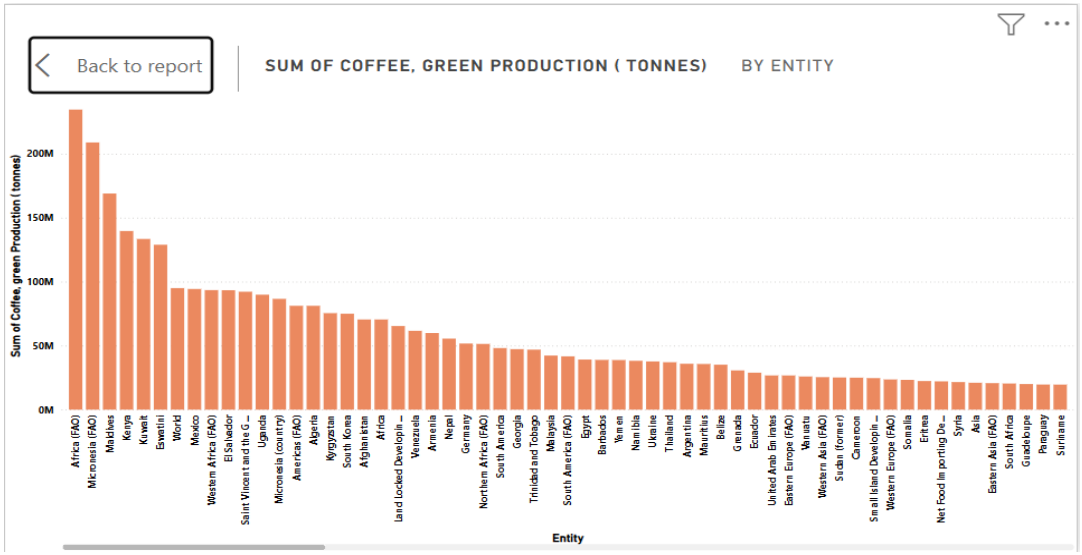

Fig.5:Sum of Coffee,Green Production(tonnes)

Phase 5: Sum of Apples, Avocados, Bananas, and Oranges Production (tonnes) by Entity

- The **stacked bar chart** displays the production volumes of apples, avocados, bananas, and oranges.
- Europe and Asia are major contributors to global fruit production.
- **Key insights:**
- Armenia and Central Asia (FAO) show the highest apple production (blue).
- Belgium-Luxembourg (FAO) and Afghanistan have significant banana and orange production (orange and purple).
- Other regions, like India and Czechia, show moderate contributions across different fruits.

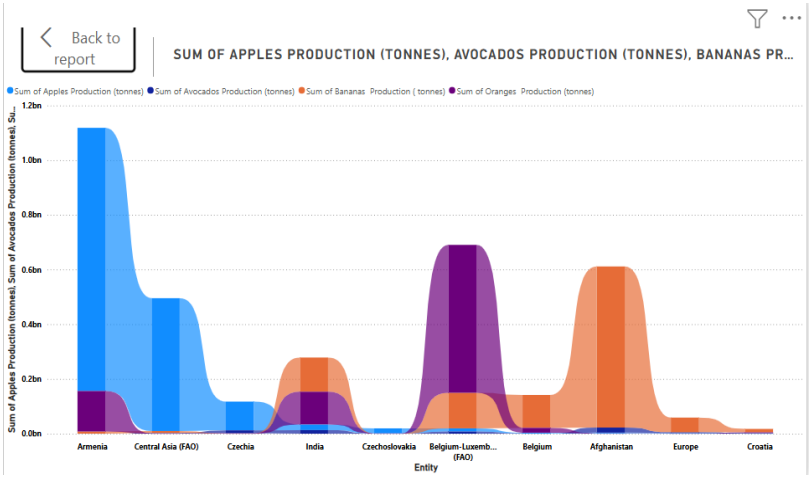

Fig.6:Sum of Apples,Avacodes,Bananas Production(tonnes)

Phase 5: Sum of Wheat, Maize, and Rice Production (tonnes) by Year

- The **area chart** illustrates annual production trends of these key crops.
- Observations:
    - Wheat, maize, and rice have all experienced a steady increase.
    - Wheat has shown the most significant growth.
    - Maize production began accelerating in the late 1980s.
    - The rise in production reflects global population growth, improved agricultural methods, and climate adaptation.

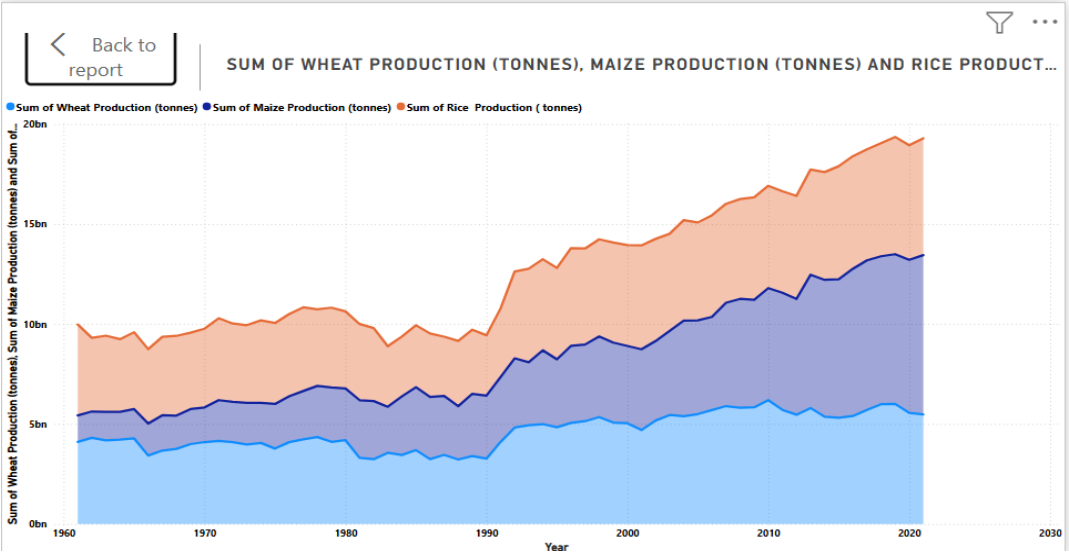

Fig.7:Sum of Wheat,Maize,Rice Production(tonnes) by Year

Phase 7: Sum of Maize Production (tonnes) by Year

The donut chart illustrates the sum of maize production (tonnes) over different years. It shows a steady increase in maize production, with the highest contribution in the most recent years. The largest segment represents the highest recorded production, indicating significant growth in maize output over time.

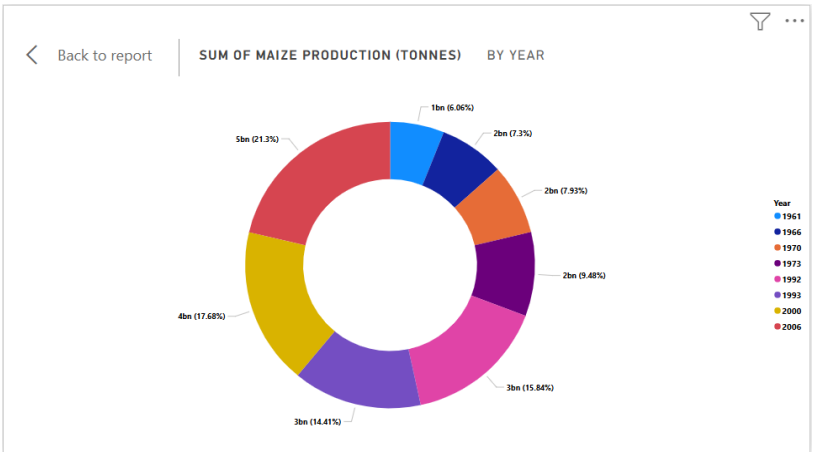

Fig.8: Sum of Maize Production (tonnes) by Year

Phase 8: Sum of Grapes, Apples, Bananas, and Oranges Production (tonnes)

The **horizontal bar chart** represents the sum of fruit production (in tonnes) for grapes, apples, bananas, and oranges. Grapes have the highest production at 43 billion tonnes, followed by apples (39bn), bananas (32bn), and oranges (26bn). This visualization highlights the leading role of grapes and apples in overall fruit production.

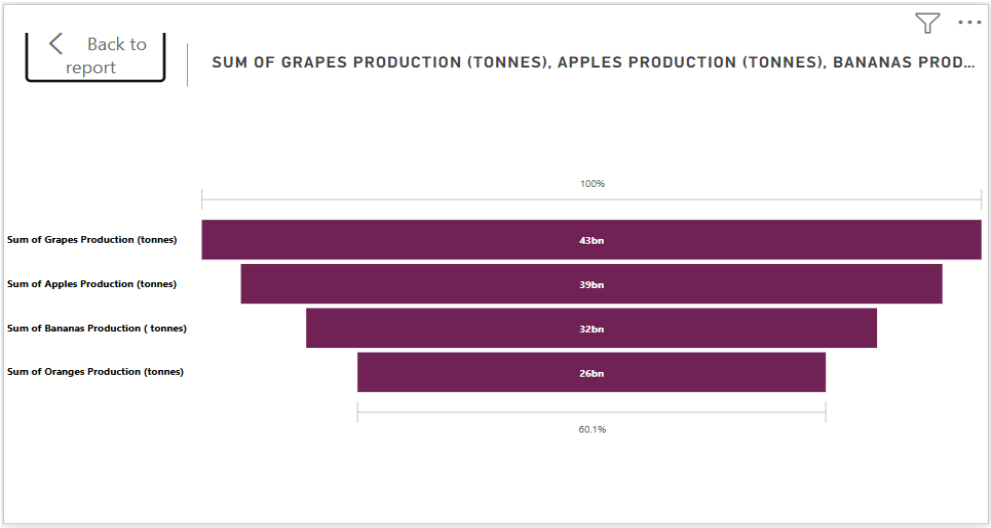

Fig.9: Sum of Grapes, Apples, Bananas, and Oranges Production (tonnes)

Milestone 4: Dashboard

The dashboard presents an analysis of global food production trends (1961–2023) using various visualizations:

- **Total Production:**
    - Rice: 269bn tonnes
    - Wheat: 282bn tonnes
    - Tea: 2bn tonnes
- **Key Visualizations:**
    - Coffee Production by Entity: Africa leads in coffee production.
    - Wheat, Maize & Rice Production by Year: A steady increase over time.
    - Fruit Production by Entity: Europe and Asia contribute significantly.
    - Maize Production by Year: Highest in 2006 (5bn tonnes), showing steady growth.

The dashboard effectively highlights food production trends across various commodities and regions.

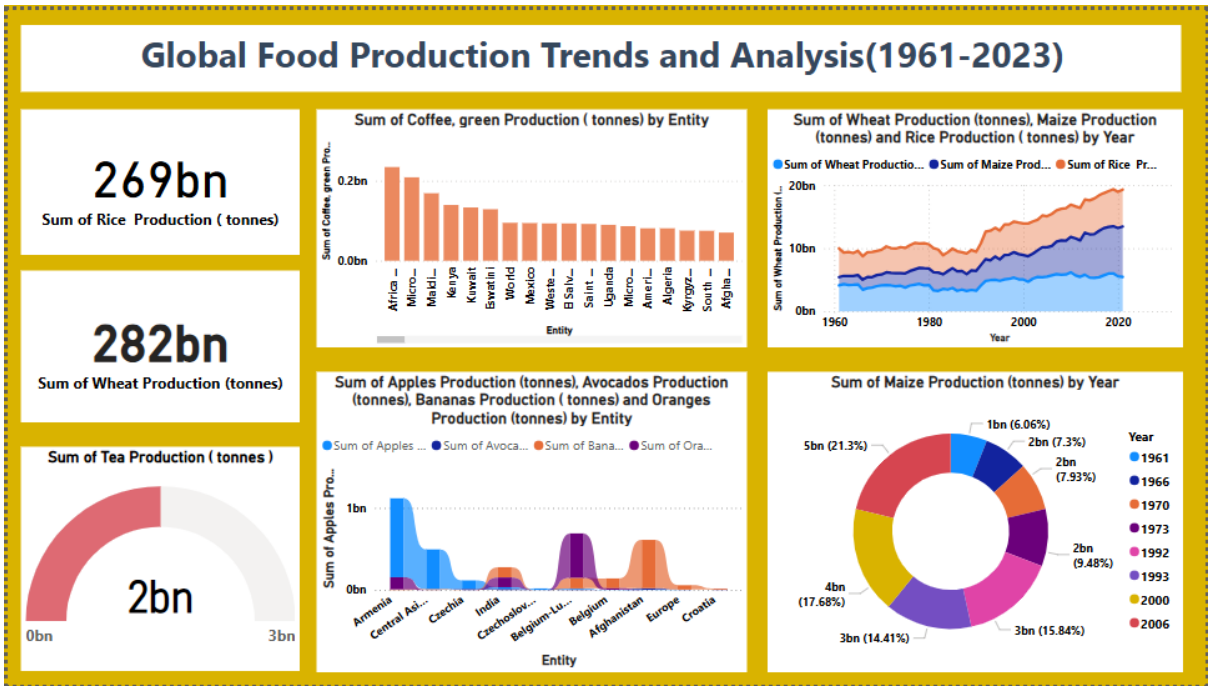

Fig.10: Dashboard

Milestone 5: Report

This Power BI dashboard provides a detailed analysis of global food production trends from 1961 to 2023. It highlights key insights into major crop production, including rice, wheat, tea, coffee, maize, and fruits, using interactive visualizations like bar charts, pie charts, and trend lines. The dashboard effectively showcases production growth, regional contributions, and significant changes over time. Designed for clarity and ease of interpretation, it allows users to explore data trends efficiently and make informed decisions based on historical insights.

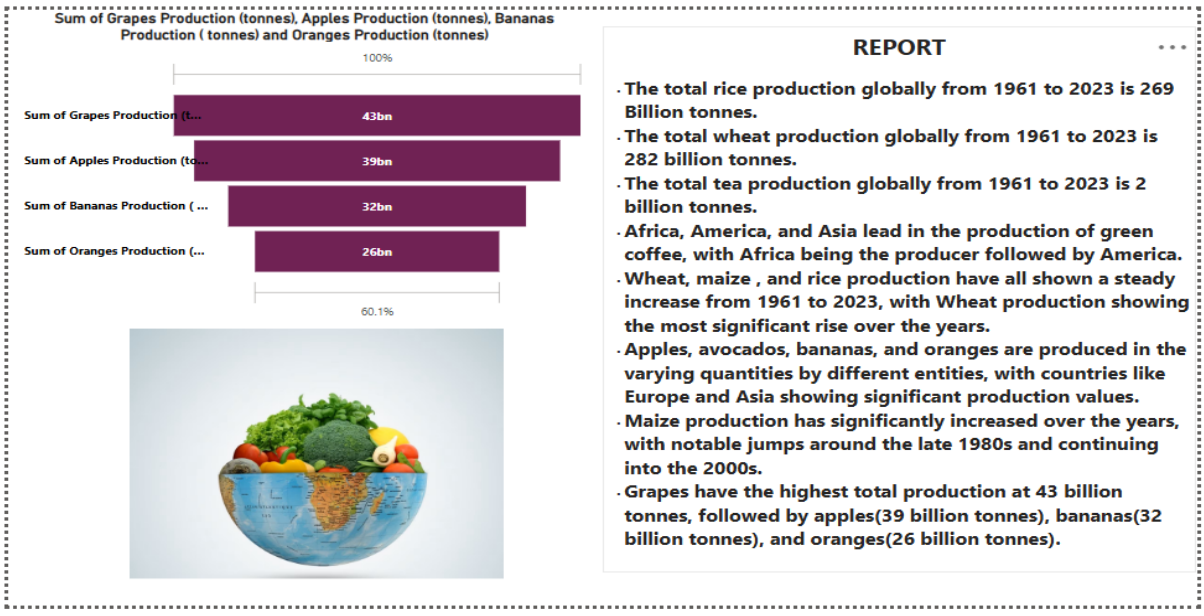

Fig.11: Report

Milestone 6: Performance Testing

"This refers to the total volume of data imported into Power BI for analysis. It represents the data successfully processed and available for visualizations, insights, and reporting. Managing data load efficiently ensures better performance and accurate results in the dashboard."

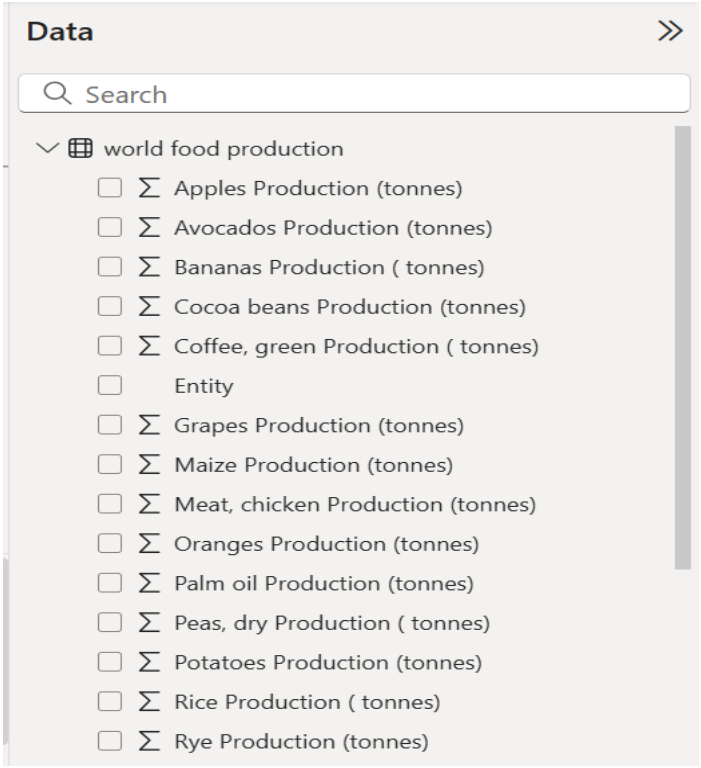

Fig.12: Data Loaded

Utilization of Filters

Filters help refine data by selecting specific values or conditions, making analysis more focused and insightful. In this report, filters were applied to enhance data visualization and interpretation.

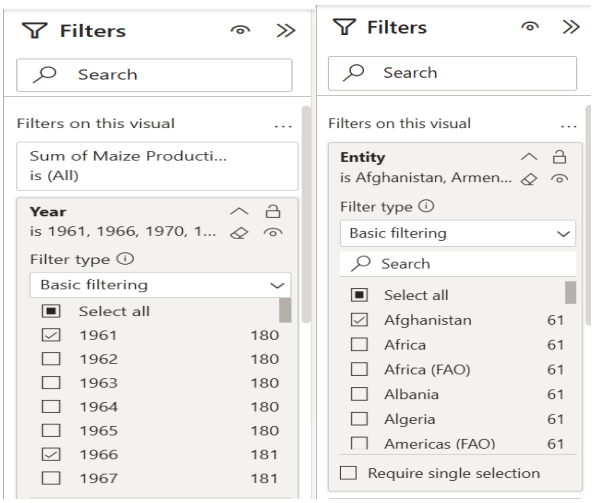

Fig.13: Filters (Year, Entity)