



Final Project Report Template

1. Introduction

This project explores global food production trends from 1961 to 2023 using a Power BI dashboard. The aim is to provide meaningful insights into crop production patterns, highlight top producers, compare global and regional output, and assist stakeholders in understanding agricultural shifts.

1.1. Project overviews

The project analyzes food production data across various countries and commodities. Using Power BI, multiple visualizations have been created to capture production volumes, trends over years, country-level insights, and crop share comparisons. The focus is on interactive, filterable dashboards that allow year-wise and region-wise analysis.

1.2. Objectives

- To analyze food production trends worldwide.
- To build a comprehensive dashboard with interactive filters.
- To provide insights into top food-producing countries and crops.
- To support stakeholders with data-driven agricultural decisions.

2. Project Initialization and Planning Phase

2.1. Define Problem Statement

I am	I'm trying to	But	Because	Which makes me feel
Someone working in the food sector — a researcher and part of an NGO.	Get a clear picture of how food production has changed over the years across different countries and crops.	The data is scattered, hard to read, and not easy to compare — especially when looking at long-term trends.	It spans over 60 years and covers many regions and crop types, so just looking at raw numbers isn't helpful.	Confused and unsure about what decisions to make or what patterns are really important.

I am	I'm trying to	But	Because	Which makes me feel
A data analyst trying to help people understand agricultural trends through visuals.	Build a dashboard that lets users explore the data easily and draw their own insights without needing technical skills.	Normal reports or Excel sheets don't let users dig deep or see the full picture over time.	There's no interactive, all-in-one tool that brings together years of food production data in a way that's easy to use.	Like I'm not helping users enough, and the data isn't being used to its full potential.

2.2. Project Proposal (Proposed Solution)

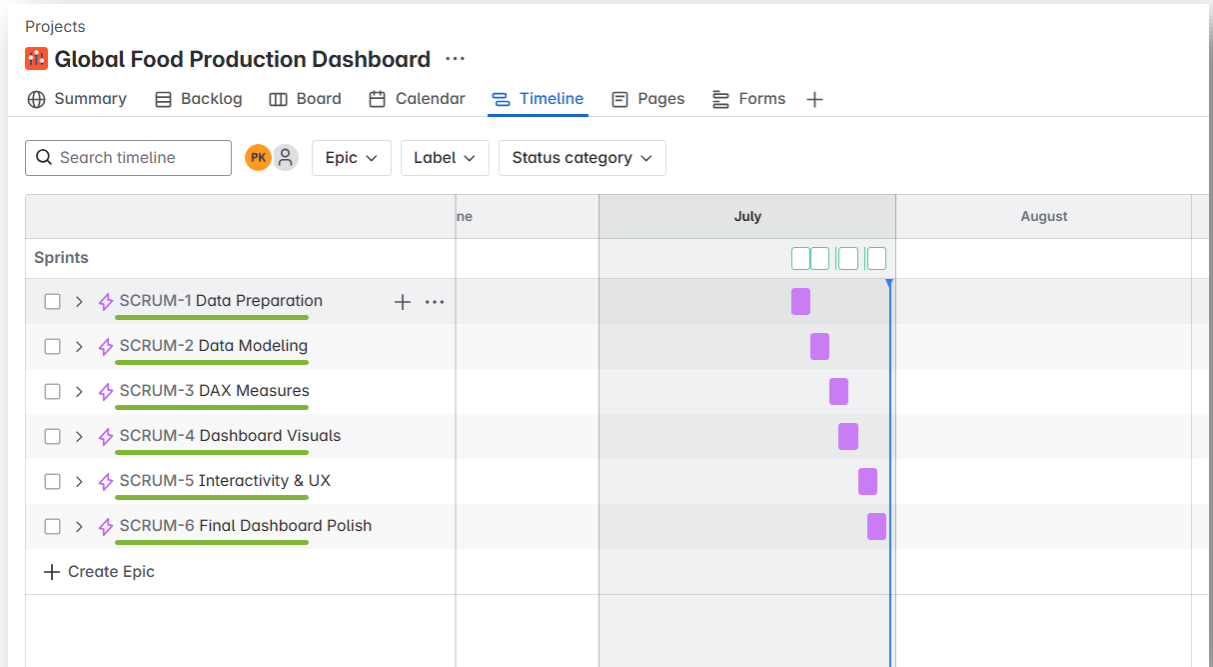
Project Overview	
Objective	The main goal of this project is to study global food production patterns from 1961 to 2023 using Power BI. The project helps us understand how different countries and crops have contributed over time, and what trends are visible in food production.
Scope	This project focuses on data cleaning, transformation, and visualization using Power BI. It includes analysis of various crops like wheat, rice, and maize, across multiple years and countries. Interactive charts and dashboards will help users explore trends and comparisons.
Problem Statement	
Description	With the growing global population, food production is a major concern. There is a need to analyze how different countries have been producing food and which crops are leading over time.
Impact	Solving this problem can help policymakers, researchers, and even students to understand the global food supply system. The findings might help in making better decisions for food sustainability.
Proposed Solution	
Approach	I am using Power BI for this project. First, I cleaned the data and then unpivoted it to make it suitable for analysis. I created DAX measures and visuals like bar charts, line charts, and maps to represent different food production scenarios.

2.3. Initial Project Planning

Project is divided into 6 sprints:

- Sprint 1: Data Preparation
- Sprint 2: Data Modelling
- Sprint 3: Dax Measures
- Sprint 4: Dashboard Visuals
- Sprint 5: Interactive UI & UX

f. Sprint 6: Final Dashboard Polish



3. Data Collection and Preprocessing Phase

3.1. Data Collection Plan and Raw Data Sources Identified

Data Collection Plan

Section	Description
Project Overview	This project analyzes global food production (1961-2023) to identify trends, regional variations, and shifts in global food supply, aiding insights into food security and agricultural development.
Data Collection Plan	Data was primarily collected from the (world food production.csv) dataset. Which was uploaded on Kaggle
Raw Data Sources Identified	The raw data sources with relevant details.

Source Name	Description	Location/URL	Format	Size	Access Permissions
World Food Production	Contains global production data (tonnes) for various food items by 'Entity' and 'Year'. It has 11,912 rows and 24 columns, covering multiple food commodities	https://www.kaggle.com/datasets/raf_sunahmad/world-food-production	CSV	2.14 Mb	Public
Crop Production 1996 to 2021	This dataset provides a comprehensive record of annual crop production, including rice, wheat, and vegetables, spanning from 1996 to 2021.	https://www.kaggle.com/datasets/abhijitdahanode/crop-production-1996-to-2021	CSV	404 B	Public

3.2. Data Quality Report

Data Source	Data Quality Issue	Severity	Resolution Plan
Dataset	Columns had incorrect data types (e.g., Year as text)	Low	Changed Year to Whole Number and Value to Decimal format using Power Query
Dataset	Extra characters or inconsistent naming in text fields	Low	Cleaned text columns using Power Query's "Trim" and "Clean" functions

Dataset	Wide format with year columns made analysis harder	Moderate	Decided to analyze without unpivoting by using custom measures and visuals
Dataset	Dataset includes global-level entities like “World” and “FAO”	Low	Chose to retain them for overall production trends and comparative insights

3.3. Data Exploration and Preprocessing

Section	Description
Data Overview	<ul style="list-style-type: none"> The dataset from FAO contains global food production data from 1961 to 2023. It covers different countries, crops, and production values. Currently the data has 11,000 rows.
Data Cleaning	<ul style="list-style-type: none"> Handled missing values and removed any blank or irrelevant rows. Duplicates were checked and cleaned. Kept “World” and “FAO” rows for global trend analysis.
Data Transformation	<ul style="list-style-type: none"> Used Power Query to unpivot year columns and restructure data. Filtered for only production-related elements and renamed columns for clarity. Added calculated columns where needed.
Data Type Conversion	<ul style="list-style-type: none"> Converted Year to whole number, Value to decimal, and ensured all text fields were in the correct format.
Column Splitting and Merging	<ul style="list-style-type: none"> Combined some fields temporarily for better DAX filtering
Data Modeling	<ul style="list-style-type: none"> Created DAX measures for totals, comparisons, and crop-wise analysis.

Save Processed Data	<ul style="list-style-type: none"> Cleaned data was saved inside the Power BI .pbix file. Backup versions were saved after each sprint phase.
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4. Data Visualization

4.1. Framing Business Questions

Question 1: What is the total rice and wheat production globally from 1961 to 2023?

Question 2: What is the total global tea production?

Question 3: Which countries or regions have the highest green coffee production?

Question 4: How has maize production changed over different years?

Question 5: What are the trends in wheat, maize, and rice production from 1961 to 2023?

Question 6: Which countries produce the most apples, bananas, oranges, and avocados?

Question 7: Which regions or countries contribute most to global food production overall?

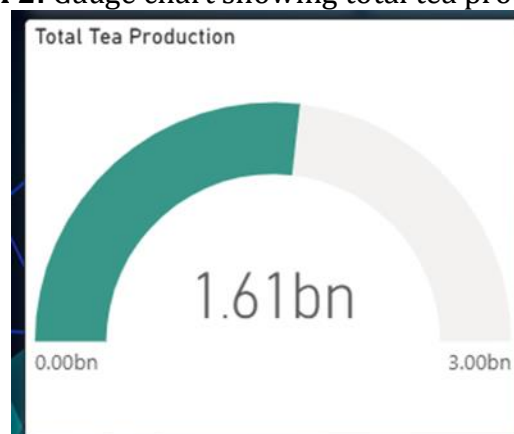
Question 8: Which are the top 10 countries with the highest rice production from 1961–2023?

4.2. Developing Visualizations

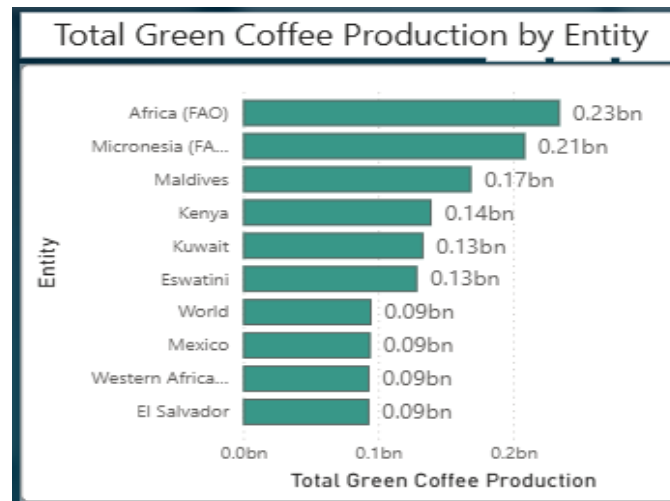
Visualization 1: KPI cards showing total rice (268.56bn) and wheat (281.80bn) production.



Visualization 2: Gauge chart showing total tea production (1.61bn)

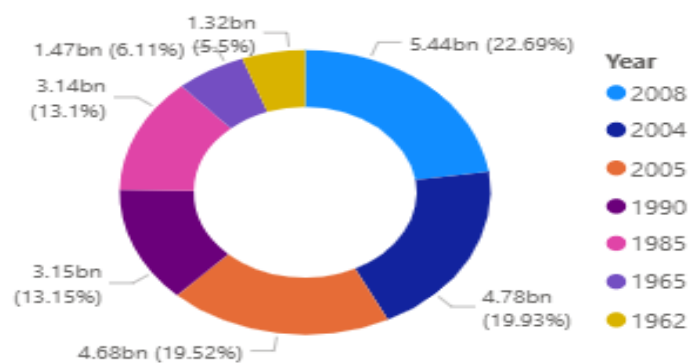


Visualization 3: Bar chart of total green coffee production by entity.

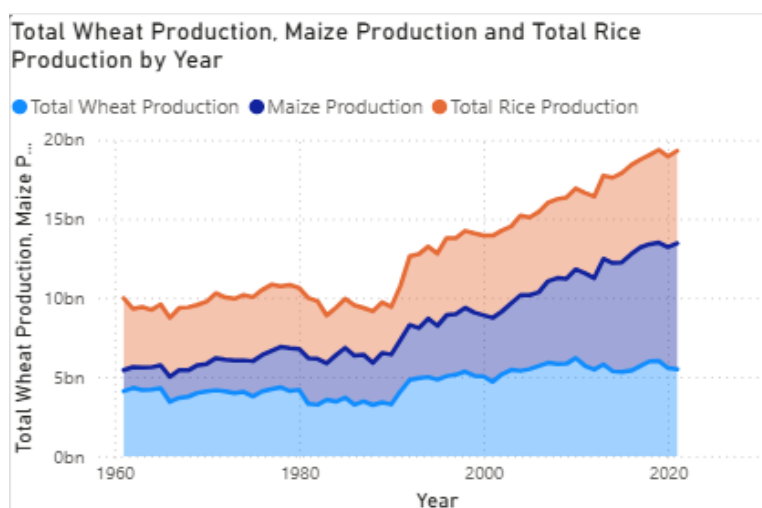


Visualization 4: Donut chart showing the sum of maize production by year.

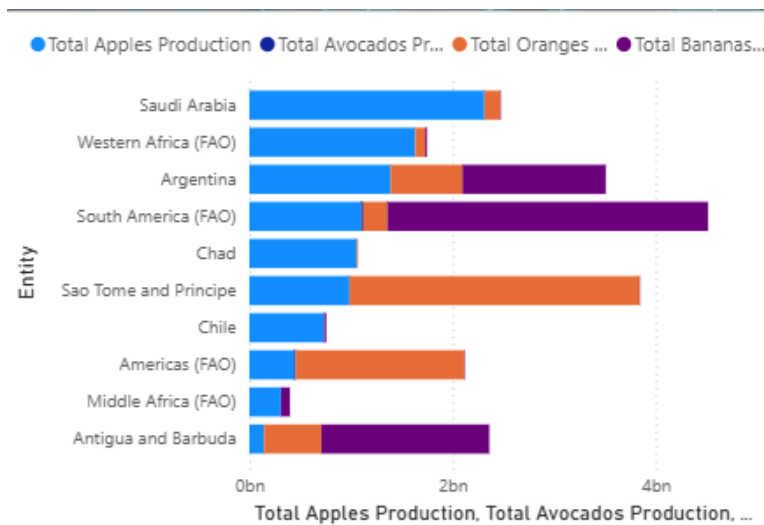
Sum of Maize Production by Year



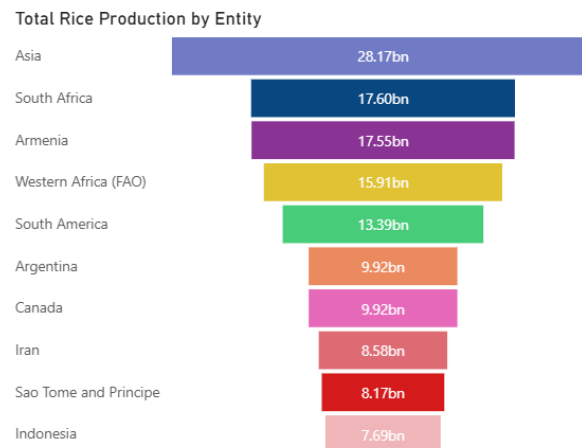
Visualization 5: Area line chart showing year-wise production of wheat, maize, and rice.



Visualization 6: Bar chart comparing fruit production by country.



Visualization 8: Funnel chart displaying top 10 countries ranked by total rice production.

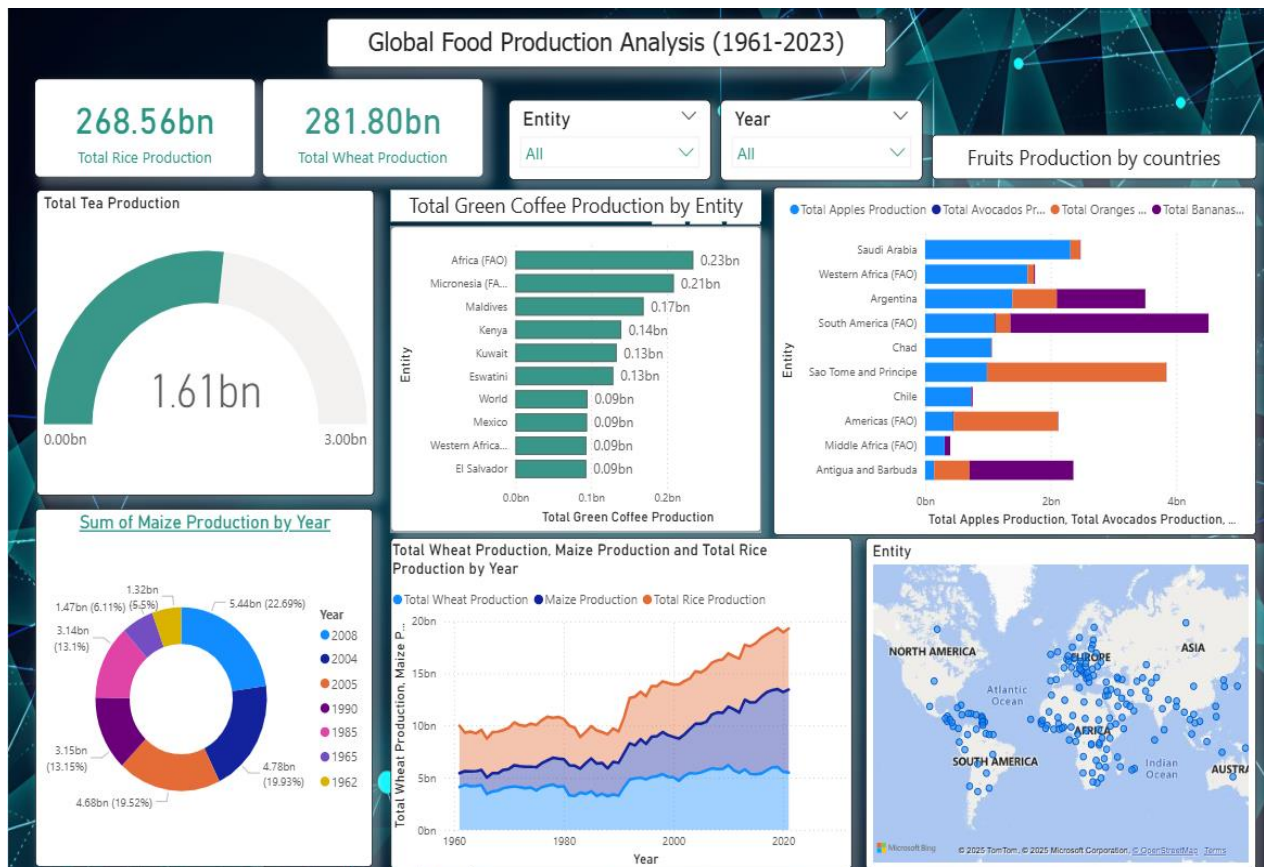


5. Dashboard

5.1. Dashboard Design File

A multi-page Power BI dashboard that allows users to filter by year, commodity, and country, and observe global and individual trends interactively.

A Dashboard created on Global Food Production Analysis(1961-2023)



6. Report

6.1. Story Design File

No storytelling or bookmarks were used. A single standard dashboard page was created with multiple visuals and slicers for interactive analysis.

7. Performance Testing

7.1 Utilization of Data filters

- Year slicer
- Entity (country/region) filter
- Dynamic tooltips and hover visuals

7.2 No. of Calculation Field

Approx. 10 measures, including:

- Total production
- Average crop output
- Top N country ranks
- % share by crop

7.3 No of Visualization

At least 8 visuals:

- Bar charts (stacked)
- Line and area charts
- Donut chart
- Gauge
- Cards (KPI)
- Maps

8. Conclusion/Observation

The project successfully highlighted global crop production trends. Wheat and rice remain dominant, with countries like China, India, and the USA leading production. Year-wise analysis showed steady growth, and visual tools made insights accessible to non-technical users.

9. Future Scope

- Integrate with weather and climate data
- Use predictive modelling for future crop trends
- Add consumption and trade analysis
- Include region-wise food insecurity metrics

10. Appendix

10.1. GitHub & Project Demo Link

10.1.1 Project Demo Video link

<https://drive.google.com/file/d/1J2sBrBiPc4SQCDl2Cx0uvq6zvgh-PRif/view?usp=sharing>