<u>Final Project Report Template</u>

1. Introduction

      1.1. Project overviews

The dataset contains comprehensive records of **global food production** from **1961 to 2023**, covering a wide range of **agricultural commodities** including cereals, fruits, beverages, and more. Each entry includes the **year**, **type of crop**, **production volume (in tonnes)**, and **region or country (entity)**.

      1.2. Objectives

The objective of this project by **ABC Company** was to conduct a comprehensive analysis of global food production trends from **1961 to 2023**, focusing on key agricultural commodities. Using **Power BI**, the project aimed to visualize and interpret production data to uncover patterns, regional strengths, and long-term shifts in global agriculture. These insights are intended to support strategic decision-making in the **agri-business and food security sectors**.

2. Project Initialization and Planning Phase
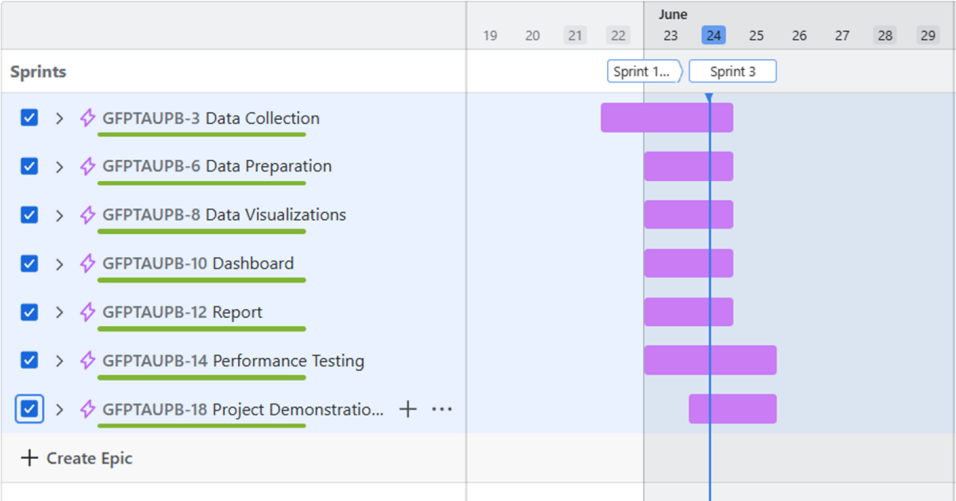
      2.1. Define Problem Statement

      2.2. Project Proposal (Proposed Solution)

Project Overview

Objective	The objective of this project by **ABC Company** was to conduct a comprehensive analysis of global food production trends from **1961 to 2023**, focusing on key agricultural commodities.
Scope	These insights are intended to support strategic decision-making in the **agri-business and food security sectors**.
Problem Statement	
Description	Identify, analyze, and visualize the production patterns of key agricultural commodities across different regions and time periods to uncover trends, regional strengths, and opportunities for strategic planning in the global agri-food sector.
Impact	Using **Power BI**, the project aimed to visualize and interpret production data to uncover patterns, regional strengths, and long-term shifts in global agriculture.
Proposed Solution	
Approach	**Data Collection & Cleaning** • Import the dataset (1961–2023) into Power BI. • Perform data cleaning: handle null values, standardize units, correct region/crop names. **Data Modeling**

Key Features	**Visual Dashboards:**
	Clear, engaging visuals for different crop categories (staples, beverages, fruits).
	Regional Comparison:
	Visual representation of production across continents and countries.
	Trend Analysis (1961–2023):
	Time-series graphs to showcase the evolution of crop production.
	Commodity-wise Insights:
	Drill-down visuals for individual crops like wheat, maize, rice, grapes, etc.
	Highlight of Key Contributors:
	Identification of top producers (e.g., Africa for coffee, Asia for rice).
	Interactive Filters:
	Allow users to customize views based on year, region, or commodity.

2.3. Initial Project Planning

3. Data Collection and Preprocessing Phase

3.1. Data Collection Plan and Raw Data Sources Identified

Section	Description

Project Overview	The objective of this project by **ABC Company** was to conduct a comprehensive analysis of global food production trends from **1961 to**
Data Collection Plan	Collected the data from Kaggle. https://www.kaggle.com/datasets/rafsunahmad/world-food-production
Raw Data Sources Identified	This dataset contains data of total production of different types of foods in per year in each country from 1961-2023 of all country. The foods are: Maize Rice Yams Wheat Tomatoes Tea Sweet potatoes Sunflower seed Sugar cane Soybeans Rye Potatoes Oranges Peas dry Palm oil Grapes

Source Name	Description	Location/URL	Format	Size	Access Permissions
Dataset 1	**World Food Production**	https://www.kaggle.com/datasets/rafsunahmad/world-food-production/data	CSV	2.14mb	Public
Dataset 2	**Telecom Churn Dataset**	https://www.kaggle.com/datasets/suraj520/telecom-churn-dataset	CSV	18.85MB	Public

3.2. Data Quality Report

Data Source	Data Quality Issue	Severity	Resolution Plan

|			
Kaagle	Data is little bit hard to search as there are more data available with the same key words.	Moderate	Given the specific name of the dataset to find out the data i.e., "World Food Production"
Kaagle	Data is messy we need to clean it for EDA and vizulization	High	I have cleaned it and done the EDA for the resolution.

3.3. Data Exploration and Preprocessing

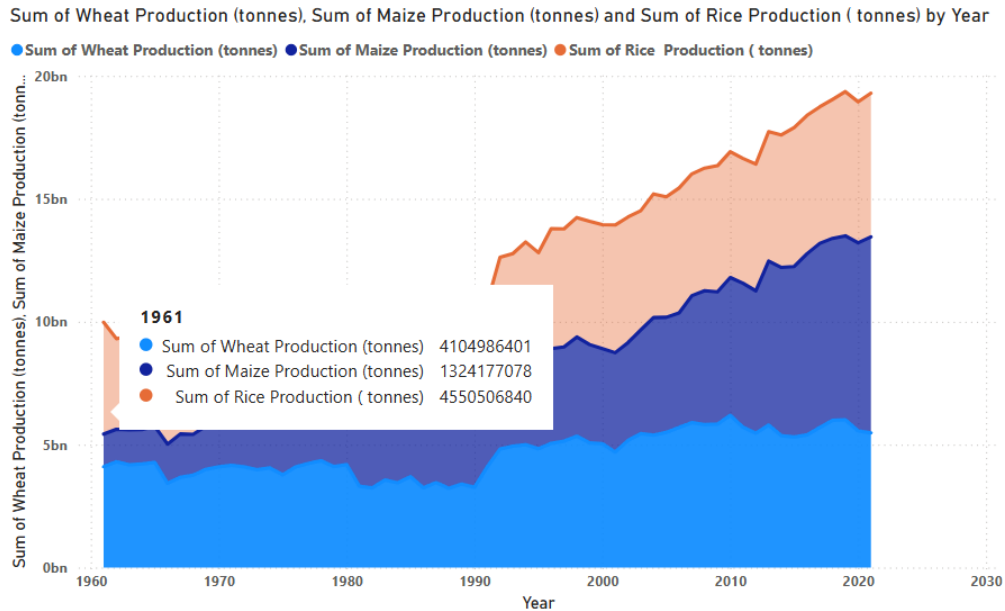| Section	Description
Data Overview	The dataset contains comprehensive records of **global food production** from **1961 to 2023**, covering a wide range of **agricultural commodities** including cereals, fruits, beverages, and
Data Cleaning	Data is cleaned no need for cleaning.
Data Transformation	Transformation is not needed
Data Type Conversion	Rectified few columns to whole number
Column Splitting and Merging	Not needed.
Data Modeling	Not needed.
Save Processed Data	Already the data was cleaned handled some '0' values and changed some columns datatype to whole number and saved it for visualization process.

4. Data Visualization
4.1. Framing Business Questions

1. **Which countries or regions are the top producers of green coffee globally, and how does production compare across different entities?**
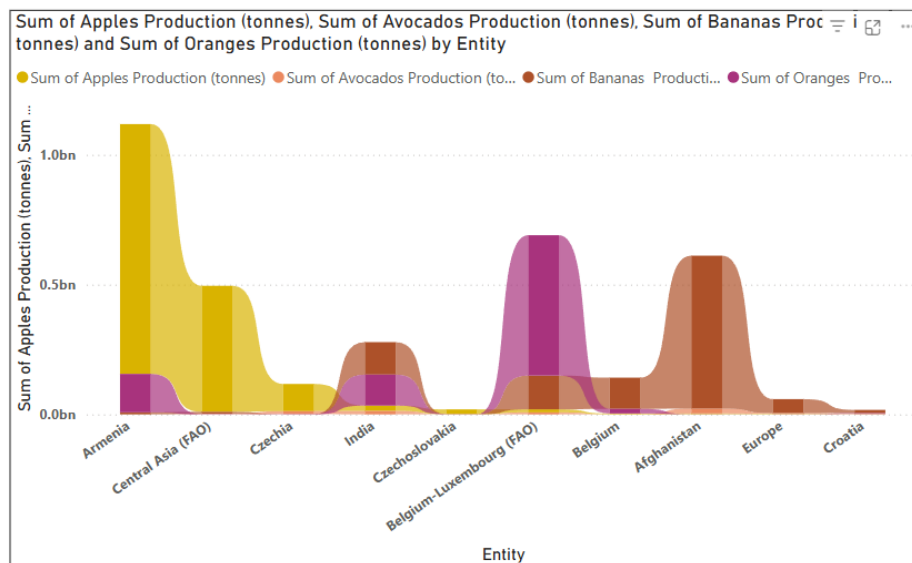

Sum of Coffee, green Production (tonnes) by Entity
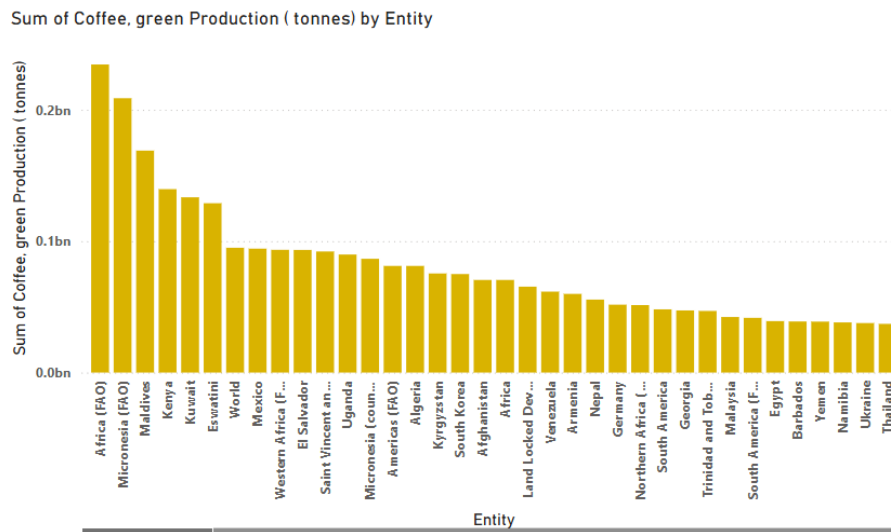
This bar chart reveals that Africa (FAO) is the leading producer of green coffee, followed closely by Micronesia and Maldives.

2. **How have global production trends of wheat, maize, and rice evolved from 1961 to 2023, and which crop has experienced the most significant growth over time?**

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

● Sum of Wheat Production (tonnes) ● Sum of Maize Production (tonnes) ● Sum of Rice Production (tonnes)

1961
● Sum of Wheat Production (tonnes)   4104986401
● Sum of Maize Production (tonnes)   1324177078
● Sum of Rice Production (tonnes)   4550506840

This stacked area chart illustrates the year-wise growth in the production of three major staple crops — wheat, maize, and rice — from 1961 to 2023.
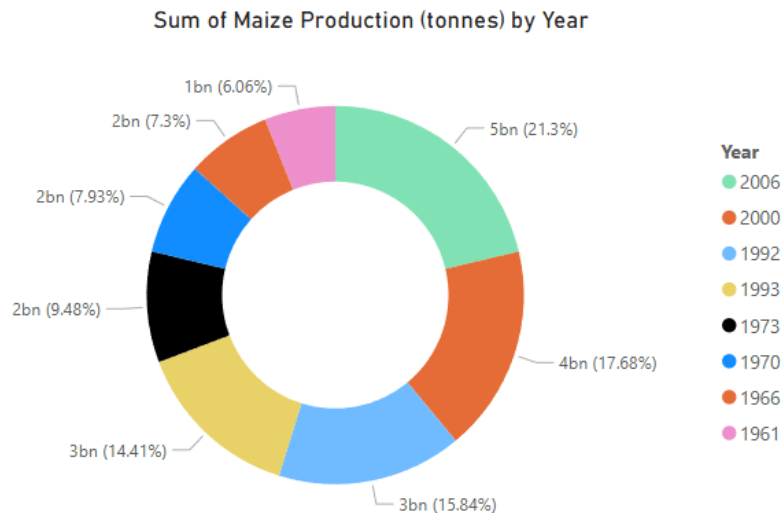
3. **How does the production of key fruits—apples, avocados, bananas, and oranges—vary across different regions, and which entities dominate each category?**

Sum of Apples Production (tonnes), Sum of Avocados Production (tonnes), Sum of Bananas Proc... tonnes) and Sum of Oranges Production (tonnes) by Entity

● Sum of Apples Production (tonnes) ● Sum of Avocados Production (to... ● Sum of Bananas Producti... ● Sum of Oranges Pro...
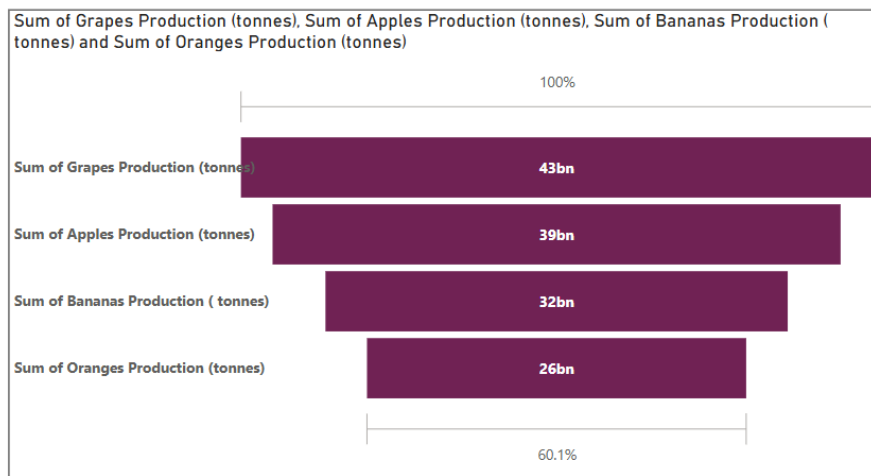
This multi-series area chart shows:

● **Central Asia (FAO) leads significantly in apple production.**

- Afghanistan and Belgium show notable dominance in banana and orange production respectively.

- India and Belgium-Luxembourg (FAO) also contribute across multiple fruit categories.

4. **How has global maize production changed across key historical years, and which year recorded the highest output?**

Sum of Maize Production (tonnes) by Year

1bn (6.06%)
2bn (7.3%)
5bn (21.3%)
2bn (7.93%)
2bn (9.48%)
4bn (17.68%)
3bn (14.41%)
3bn (15.84%)

Year
- 2006
- 2000
- 1992
- 1993
- 1973
- 1970
- 1966
- 1961

**This donut chart breaks down maize production across selected years.**

5. **Which fruit has contributed the most to global production volume, and how do apples, bananas, grapes, and oranges compare in terms of total output?**

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

100%

Sum of Grapes Production (tonnes)	43bn
Sum of Apples Production (tonnes)	39bn
Sum of Bananas Production (tonnes)	32bn
Sum of Oranges Production (tonnes)	26bn

60.1%

This horizontal bar chart compares the total global production (in tonnes) of key

fruits.

6. **Which countries have experienced the most significant growth or decline in banana production from 1961 to 2023, and what trends can be observed among the top 15 producers?**
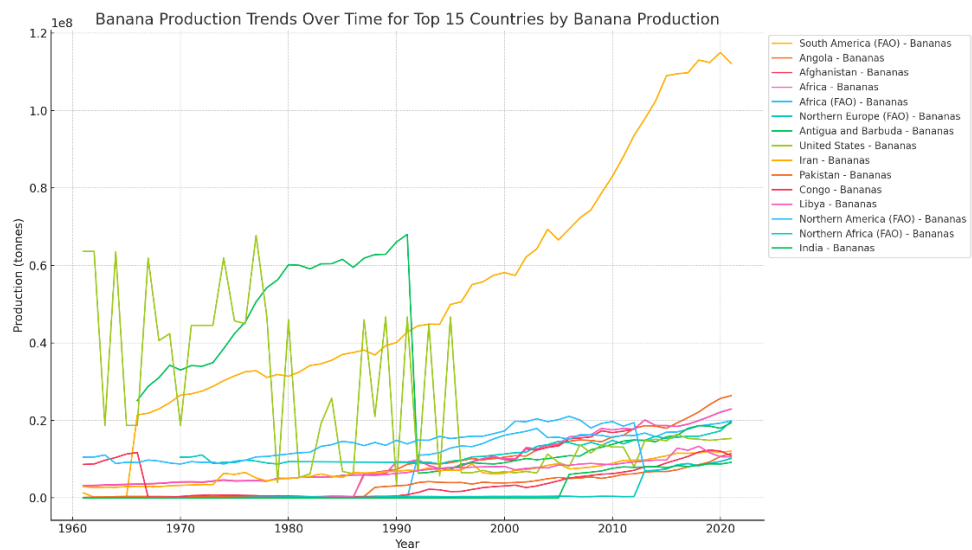

This multi-line trend chart tracks banana production across the top 15 countries/regions over several decades.

7. **Among the top 15 banana-producing countries in 2021, which countries also have the highest production volumes for apples and oranges, potentially offering diversified sourcing opportunities for a global fruit distributor?**
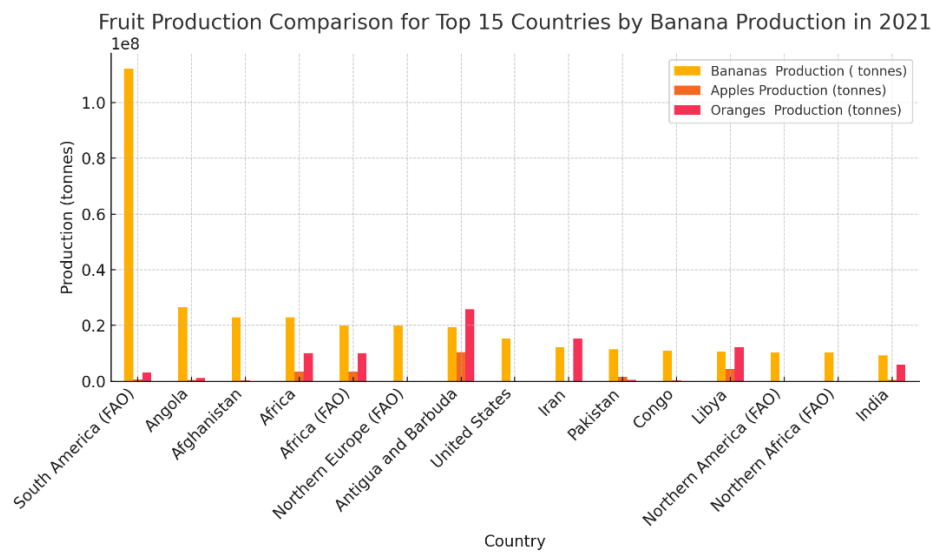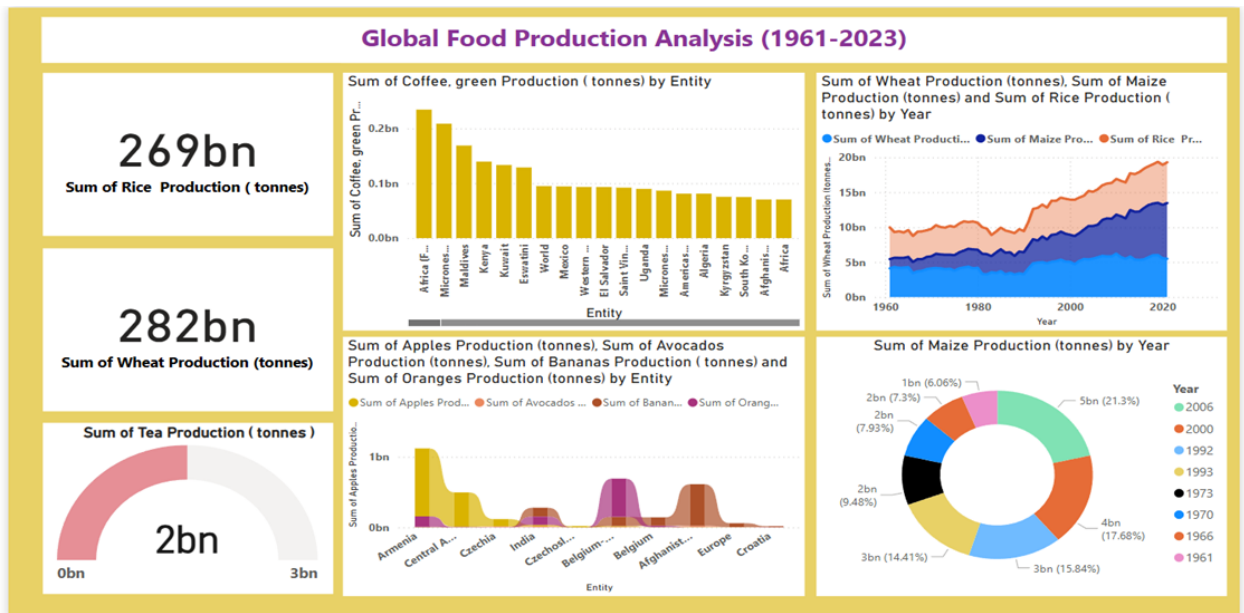
8. **Which countries/regions in the top 15 (e.g., Argentina, Morocco, South Africa) represent the highest-volume agricultural producers, signaling priority targets for investing in logistics infrastructure like grain silos or port expansions?**
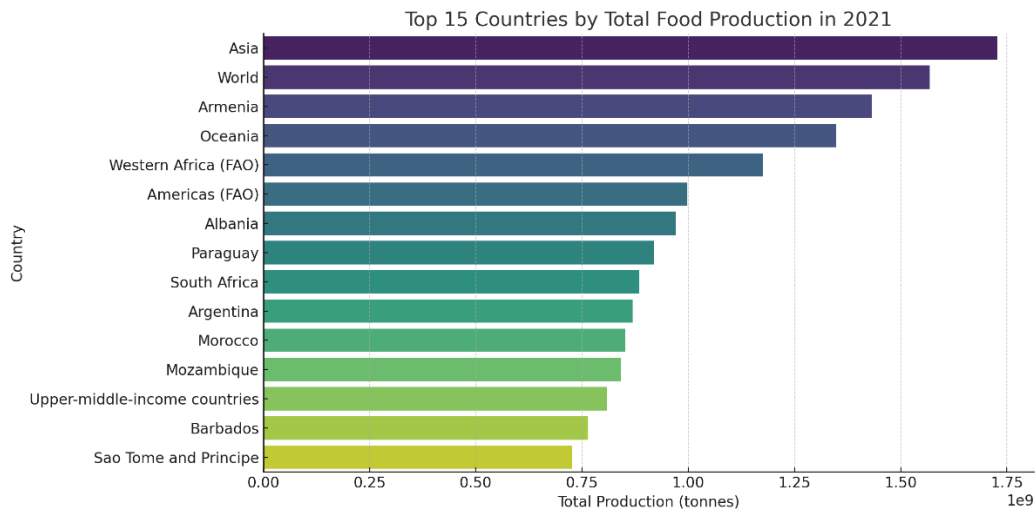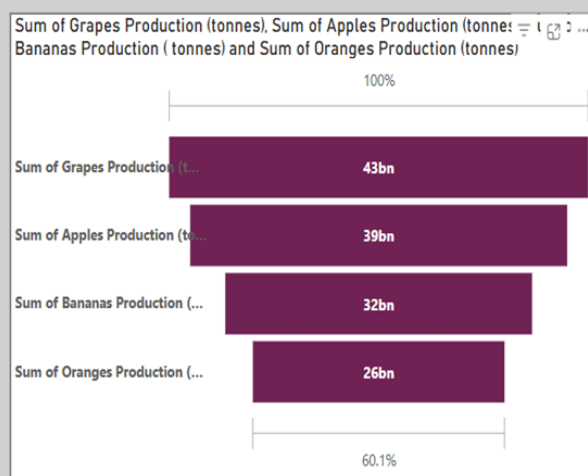

4.2. Developing Visualizations
5. Dashboard
5.1. Dashboard Design File

6. Report

6.1. Story Design File

REPORT

- The total rice production globally from 1961 to 2023 in 269 billion tonnes.
- The total wheat production globally from 1961 to 2023 is 282 billion tonnes.
- The total tea production globally from 1961 to 2023 is 2 billion tonnes.
- Africa, America, and Asia lead in the production of green coffee, with Africa being the top producer followed by America.
- Wheat, maize, and rice production have all shown a steady increase from 1961 to 2023, with wheat production showing the most significant rise over the years.
- Apples, avocados, bananas, and oranges are produced in varying quantities by different entities, with countries like Europe and Asia showing significant production volumes.
- Maize production has consistently increased over the years, with notable jumps around the late 1980s and continuing into the 2000s.
- Grapes have the highest total production at 43 billion tonnes, followed by apples (39 billion tonnes), bananas (32 billion tonnes), and oranges (26 billion tonnes).

7. Performance Testing

7.1 Utilization of Data filters

Entity ∧ 🔒

is Belgium-Luxemb... ✐ 👁

Filter type ⓘ

Basic filtering ∨

🔍 Search

■ Select all	
☑ Afghanistan	61
☐ Africa	61
☐ Africa (FAO)	61
☐ Albania	61
☐ Algeria	61
☐ .... (FAO)	61

☐ Require single selection

Year ∧ 🔒

is 1966, 1970, 1973... ✐ 👁

Filter type ⓘ

Basic filtering ∨

■ Select all	
☑ 1961	180
☐ 1962	180
☐ 1963	180
☐ 1964	180
☐ 1965	180
☑ 1966	181
☐ 1967	181

☐ Require single selection

7.2 No of Calculation Field
0
7.3 No of Visualization
bar chart, ribon chart, line chart, donote chart, tree map

8. Conclusion/Observation

The analysis of global food production trends from **1961 to 2023** provides ABC Company with valuable insights into the **evolution, scale, and regional dynamics** of key agricultural commodities. Through interactive Power BI dashboards, the following observations were made:

Key Observations:

1. **Wheat, Rice, and Maize** dominate global crop production, with wheat showing the **most significant long-term growth**.
2. **Tea and Green Coffee** production highlight regional specialties, with **Africa emerging as a leading producer of green coffee**.
3. **Fruit production** trends show that **grapes lead in total volume**, followed by apples, bananas, and oranges.
4. **Maize production** has shown **steady and significant growth** especially from the **late 1980s onward**, indicating advancements in farming practices and global demand.
5. **Europe and Asia** are top contributors in the production of several key fruits, pointing to regional agricultural strength.
6. **Year-over-year trends** reflect not only technological improvements but also changes in **climate conditions, policy, and global consumption patterns**.

Conclusion:

This project equips decision-makers with **actionable insights** for crop prioritization, **regional strategy development**, and **agricultural investment planning**. By transforming raw data into meaningful visualizations, ABC Company can make **data-driven decisions** to support global food security and supply chain resilience.

9. Future Scope

The **Feature Scope** defines the key functional and analytical components included in the Power BI-based global food production analysis project. These features enable users to **interact with the data**, extract **meaningful insights**, and support **strategic decision-making**.
10. Appendix
      10.1. Source Code(if any)
      10.2. GitHub & Project Demo Link

      https://github.com/Abhijeet107/Global-Food-Production-Analysis
      https://drive.google.com/file/d/12qxp-
O9upRkZd8jf7ZtztRylHsWqwJ7N/view?usp=sharing