Final Report of Global Food Production Trends And Anlysis(1961 -2023)

Index

1. INTRODUCTION

1.1 Project Overview:

Food is the fuel of life, and its production shapes economies, societies, and the future of our planet. From the golden fields of wheat to the lush plantations of cocoa, every crop tells a story of growth, demand, and sustainability. This report dives into the dynamic world of global food production, uncovering trends from 1961 to 2023. Through interactive Power BI visualizations, we bring data to life—showing how nations cultivate, compete, and contribute to feeding the world.

1.2 Purpose:

Understanding food production isn't just about numbers—it's about ensuring a sustainable future. This report delves deep into production patterns, key contributors, and growth trends to provide actionable insights. Whether for policymakers, researchers, or industry leaders, these data-driven insights empower better decisions for a more food-secure world.

2. IDEATION PHASE

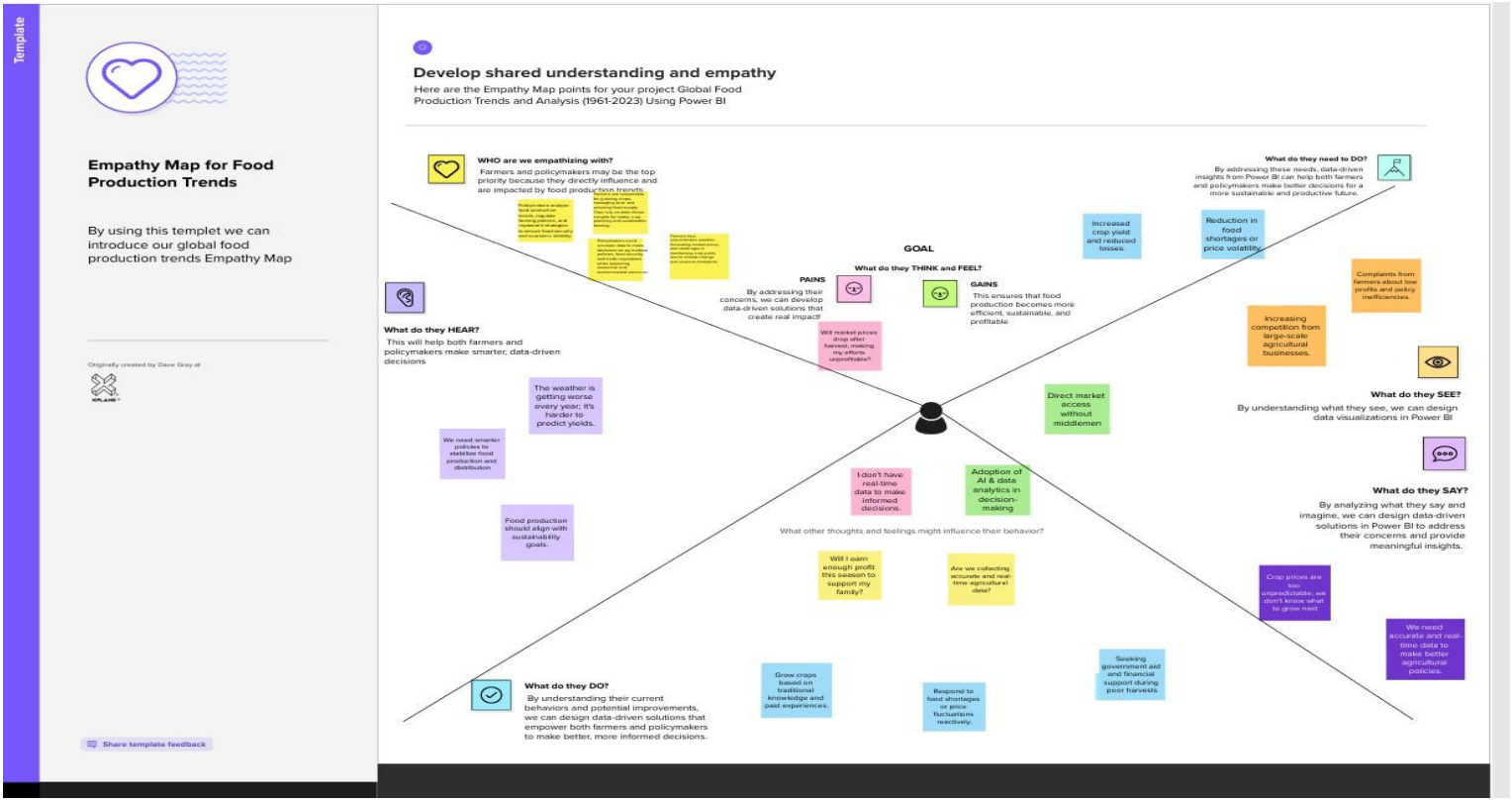
2.1 Problem Statement:

The global food production system is plagued by challenges such as climate change, inefficient resource management, and food wastage. These problems lead to reduced crop yields and significant losses in the supply chain.

2.2 Empathy Map Canvas:

The empathy map highlights stakeholders like farmers, policymakers, agritech innovators, and food distribution managers. Their primary concerns include crop yield, sustainable practices, and resource optimization.

- **Example:**



2.3 Brainstorming:

Template

Global Food Production Trends - Brainstorming

By using this templet we can introduce our global food production trends brainstorming concept

- **10 minutes** to prepare
- **1 hour** to collaborate
- **2-3 people** recommended

Before you collaborate

Before Collaborating on this session , we done little bit preparation like reviewing the key concepts , familiarize ourselves with the tools we'll be using, and understand the objectives will help us to get the most relevant experience .
A lillte bit preparation goes a long long wayin making our learining skills smoother and more productive

10 minutes

A **Team gathering**

There are three team members in a team, where one is going to lead the project, another one is going to design and develop suitable visualization and third one is going to provide insights into data sources and trends.

B **Set the goal**

The primary goal of this project is to develop a Power BI solution that accurately predicts global food availability and trends using real-time data.
To archive a primary objectives by integrating ,cleaning ,preprocessing the data

C **Learn how to use the facilitation tools**

Ensure every team member contributes ideas and insights. Structure the session with clear steps: idea generation, grouping, and prioritization.

Open article →

1

Define your problem statement

How might we leverage data visualization to uncover critical insights from global food production trends and identify key factors influencing food security and sustainability?"

5 minutes

PROBLEM

How might we develop a Power BI solution to accurately predict global food availability and trends using real-time data?

Key rules of brainstorming

To run an smooth and productive session

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Listen to others.
- Go for volume.
- If possible, be visual.

2

Brainstorm

Following are some ideas which disrcibes our project objectives.

10 minutes

Sairaj Chande

Global Food Availability Prediction. Use historical data and current trends to predict future food availability and shortages.

Food Trends Dashboard Use color-coded maps to represent surplus and deficit areas

Food Price Prediction Incorporate factors like inflation, transportation costs, and supply chain disruptions.

Ragini Thorat

Visualizing food production with the help of given entity.

Risk mitigation strategies to reduce food insecurity by potential crises.

Calculating yearly production the food and represent it in suitable visualization.

Indrajeet Kumbhar

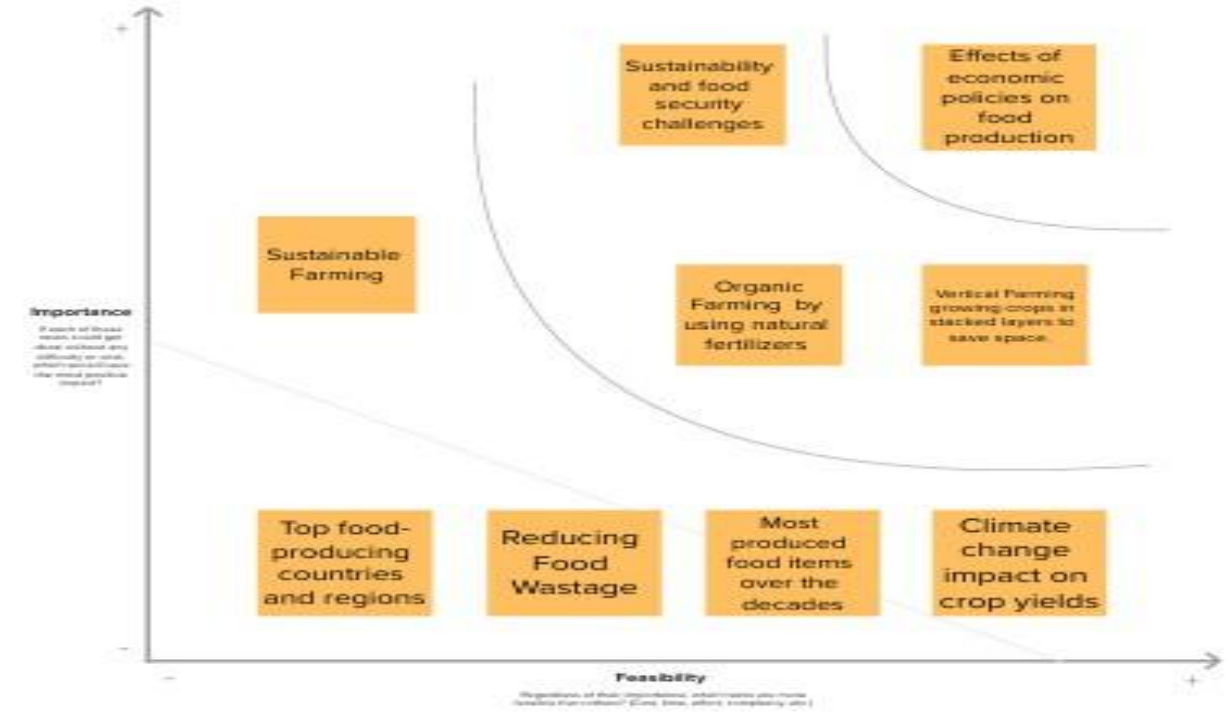
Impact analysis of climate changes on crops of food.

Combine various factors like food availability, accessibility, and utilization into a comprehensive index..

Country wise distribution of the food .

Prioritize

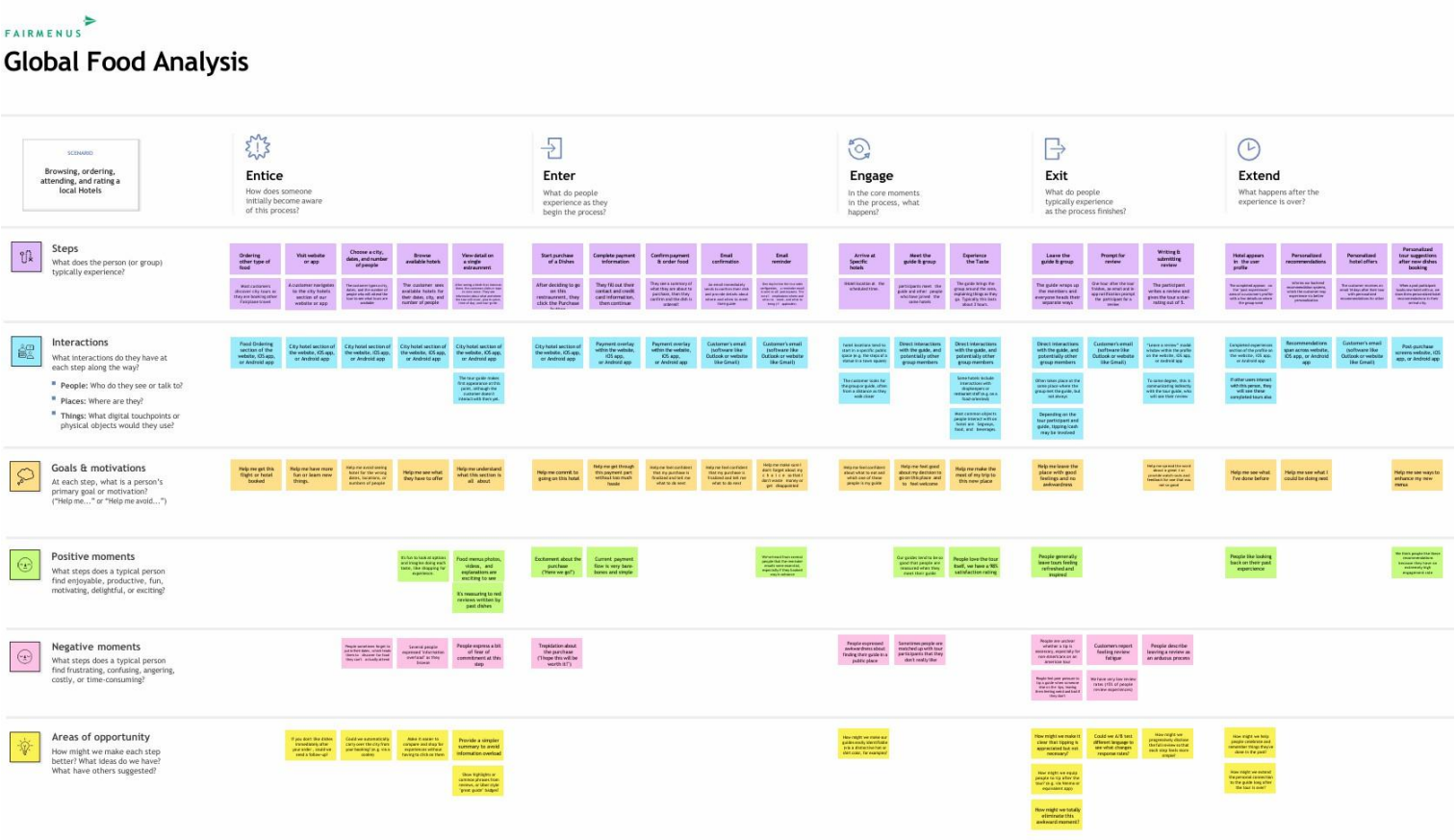
Placing our ideas on this grid to determine which ideas are important and which are feasible.



3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map:

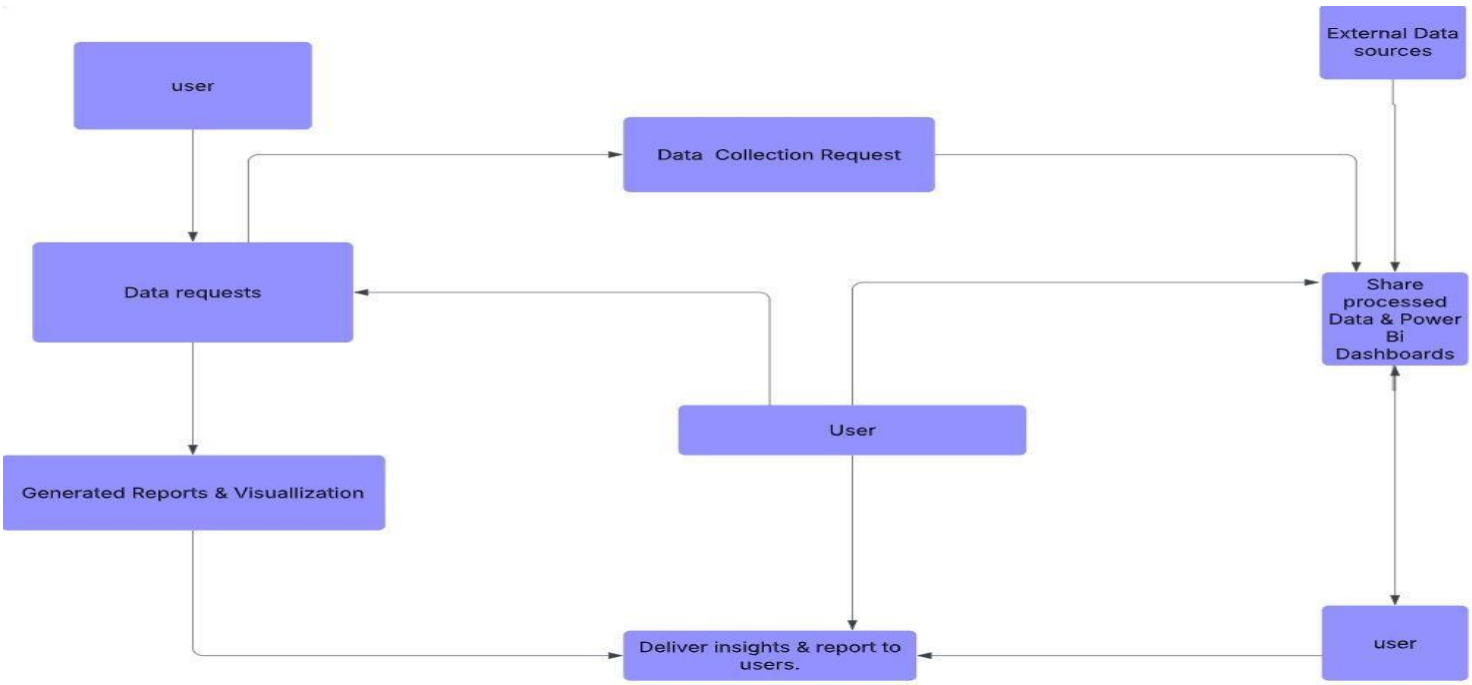
Identifies key stakeholders and their interactions with the system. Includes farmers, agronomists, supply chain managers, and policymakers.



3.2 Solution Requirement:

- Real-time data collection from sensors.
- Predictive analytics for crop yield forecasting.
- Efficient irrigation management using IoT.
- Supply chain transparency with blockchain integration.

3.3 Data Flow Diagram:



3.4 Technology Stack:

- Power BI
- SQL/Azure
- DAX (Power BI)
- Power BI Service

4. PROJECT DESIGN

4.1 Problem Solution Fit:

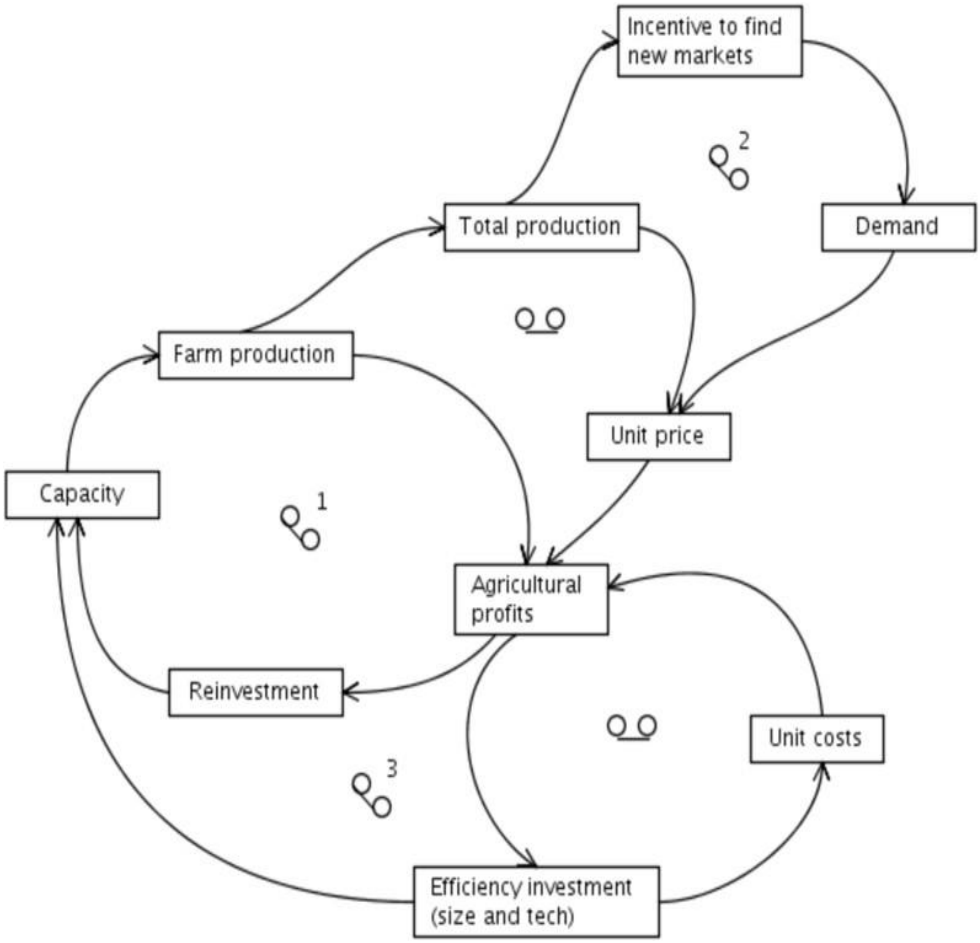
The system aligns with the need for efficient resource management and enhanced agricultural productivity.

4.2 Proposed Solution:

A comprehensive system that monitors soil moisture, climate conditions, and crop health using IoT and AI. Predictive analytics will forecast yields and suggest optimal resource allocation.

4.3 Solution Architecture:

A multi-layered architecture that includes data acquisition, data processing, analytics, and dashboard visualization.



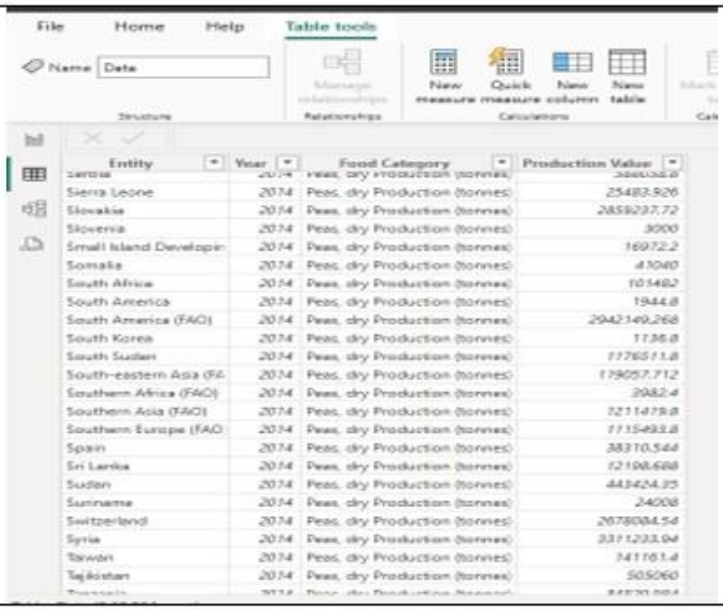
5. PROJECT PLANNING & SCHEDULING

Phase 1: Requirements Gathering and Analysis
Phase 2: System Design and Architecture
Phase 3: Development and Integration
Phase 4: Testing and Validation
Phase 5: Deployment and Maintenance

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	5	7 Days	11 Feb 2025	17Feb 2025	5	17Feb 2025
Sprint-2	6	7 Days	18 Feb 2025	25 Feb 2025	6	25 Feb 2025
Sprint-3	9	7 Days	25 Feb 2025	2 Mar 2025	9	2 Mar 2025
Sprint-4	7	7 Days	5 Mar 2025	11 Mar 2025	7	11 Mar 2025

6. FUNCTIONAL AND PERFORMANCE TESTING

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	The dataset has **11,912 entries** with **24 columns**. Columns include: • **Entity** (Country or region) • **Year** (1961 to 2023) • Production quantities for various crops and food products, such as: ○ **Maize, Rice, Wheat, Tomatoes, Tea, Sweet potatoes, Sunflower seeds** ○ **Sugar cane, Soybeans, Rye, Potatoes, Oranges, Peas** ○ **Palm oil, Grapes, Coffee, Cocoa beans, Chicken meat, Bananas, Avocados, Apples** After transforming data it only consists 4 columns.
2.	Data Preprocessing	
3.	Utilization of Data Filters	Top 7 Production Values Bottom 7 Production Vlaues

		Top 10 Production value by year
4.	DAX Queries Used	1.Top 5 Producing Countries Ranked = VAR TopCountries = TOPN(5, SUMMARIZE(FoodData, FoodData[Country], "TotalProduction", SUM(FoodData[Production Value])), [TotalProduction], DESC) RETURN CONCATENATEX(ADDCOLUMNS(TopCountries, "Rank", RANKX(TopCountries, [TotalProduction],, DESC)), [Rank] & " : " & FoodData[Country], " | ") 2.Top Producing Country = VAR TopCountry = TOPN(1, SUMMARIZE(FoodData, FoodData[Country], "TotalProduction", SUM(FoodData[Production Value])), [TotalProduction], DESC) RETURN CONCATENATEX(TopCountry, FoodData[Country], ", ") 3.Total Global Production = SUM('FoodData'[Production Value])

7. RESULTS

7.1 Output:

Report:

Dashboard:


Global Food Production Trends (1961-2023)
Sum of Production Value by Year and Food Type
Food Type
Apples Produc...
Avocados Pr...
Top Producing Country
Asia
Total Global Production
0.00T
4.00T
Country
All
Food Type
All
Year
All
Clear all slicers
Sum of Production Value by Country
Country
Fastest Growing Crop
Tea Production (to...
Sum of Production Value by Year and Food Type
Food Type
Apples Producti...
Avocados Pr...
Sum of Production Value
Year
Sum of Production Value by Country
NORTH AMERICA
EUROPE
ASIA
Atlantic Ocean
AFRICA
SOUTH AMERICA
Indian Ocean
Sum of Production Value by Country
Country
Asia
Peru
World
Argentina
Western Africa (F...

8. ADVANTAGES & DISADVANTAGES

8.1 Advantages:

- Reduces food wastage through accurate forecasting
- Enhances crop productivity using AI-driven insights
- Improves decision-making with data-driven analytics
- Identify food production patterns
- Helps predict shortages and optimize supply
- Compares food production across countries

8.2 Disadvantages:

- High initial cost for IoT device setup
- Potential resistance to new technology adoption
- Historical data may be incomplete
- Insights can be out dated

9. CONCLUSION

The proposed solution addresses global food production challenges by integrating modern technologies for precision agriculture and supply chain optimization. The system provides valuable insights, reduces wastage, and enhances overall productivity.

Power BI's interactive dashboards enable data-driven decisions, enhancing productivity and sustainability while empowering stakeholders to address agricultural challenges proactively

10. FUTURE SCOPE

1. **Real-Time Monitoring:** Utilize Power BI dashboards to monitor crop health, water usage, and supply chain efficiency in real time.

2. **Predictive Analytics:** Integrate AI and machine learning models to forecast yields, climate patterns, and resource optimization.

3. **Data Integration:** Combine data from IoT sensors, weather forecasts, and agricultural databases for comprehensive analysis.

4. **Customized Dashboards:** Create tailored visualizations for farmers, policymakers, and supply chain managers.

5. **Sustainability Tracking:** Monitor environmental impacts and resource utilization to promote sustainable practices.

11. APPENDIX