



Tech Saksham

Case Study Report

Data Analytics with Power BI

“Real-Time Analysis of Crop Production ”

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ABSTRACT

Crops are plants that are produced and harvested by farmers for profit or subsistence. Crops may be ingested by both animals and humans and are necessary for life to exist. Agriculture is the branch of science that deals with the study of agricultural cultivation and cattle rearing. Crops can be cultivated in two ways: agriculture or aquaculture. Crops are harvested and utilized as food for humans.

Crops are plants that are grown on a big scale from the same variety. Crops are classified according to the seasons in which they grow. As per the 2014 FAO world agriculture statistics India is the world's largest producer of many fresh fruits like banana, mango, guava, papaya, lemon and vegetables like chickpea, okra and milk, major spices like chili pepper, ginger, fibrous crops such as jute, staples such as millets and castor oil seed. India is the second largest producer of wheat and rice, the world's major food staples.

INDEX

Sr. No.	Table of Contents	Page No.
1	Chapter 1: Introduction	4
2	Chapter 2: Services and Tools Required	11
3	Chapter 3: Project Architecture	13
4	Chapter 4: Modeling and Result	15
5	Conclusion	22
6	Future Scope	23
7	References	24
8	Links	25

CHAPTER 1

INTRODUCTION

One of India's major agricultural products, rice, is suffering as a result of shifting monsoon patterns. States in the East and Northeast of the country (Uttar Pradesh, Bihar, and Odisha), have experienced high temperatures and insufficient rainfall in 2022, in contrast to Central and Southern India, which has experienced excessive rain in recent months, resulting in flooding in the Southern states of Kerala, Karnataka, and Madhya Pradesh.

The rice crop this season is therefore anticipated to decrease by roughly 6.77 million tonnes to 104.99 million, according to India's ministry of agriculture.

History

Before the 18th century, cultivation of sugarcane was largely confined to India. A few merchants began to trade in sugar – a luxury and an expensive spice in Europe until the 18th century. Sugar became widely popular in 18th-century Europe, then graduated to become a human necessity in the 19th century all over the world. Sugarcane plantations, just like cotton farms, became a major driver of large and forced human migrations in the 19th century and early 20th century – of people from Africa and from India, both in millions – influencing the ethnic mix, political conflicts and cultural evolution of Caribbean, South American, Indian Ocean and Pacific Island nations.

The history and past accomplishments of Indian agriculture thus influenced, in part, colonialism, slavery and slavery-like indentured labour practices in the new world, Caribbean wars and world history in 18th and 19th centuries.

Irrigation

Indian irrigation infrastructure includes a network of major and minor canals from rivers, groundwater well-based systems, tanks, and other rainwater harvesting projects for agricultural activities. Of these, the groundwater system is the largest. Of the 160 million hectares of cultivated land in India, about 39 million hectare can be irrigated by groundwater wells and an additional 22 million hectares by irrigation canals. In 2010, only about 35% of agricultural land in India was reliably irrigated.[About 2/3rd cultivated land in India is dependent on monsoons. The improvements in irrigation infrastructure in the last 50 years have helped India improve food security, reduce dependence on monsoons, improve agricultural productivity and create rural job opportunities. Dams used for irrigation projects have helped provide drinking water to a growing rural population, control flood and prevent drought-related damage to agriculture. However, free electricity and attractive minimum support price for water intensive crops such as sugarcane and rice have encouraged ground water mining leading to groundwater depletion and poor water quality. A news report in 2019 states that more than 60% of the water available for farming in India is consumed by rice and sugar, two crops that occupy 24% of the cultivable area.

Problem

"Slow agricultural growth is a concern for policymakers as some two-thirds of India's people depend on rural employment for a living. Current agricultural practices are neither economically nor environmentally sustainable and India's yields for many agricultural commodities are low. Poorly maintained irrigation systems and almost universal lack of good extension services are among the factors responsible. Farmers' access to

markets is hampered by poor roads, rudimentary market infrastructure, and excessive regulation."

"With a population of just over 1.3 billion, India is the world's largest democracy. In the past decade, the country has witnessed accelerated economic growth, emerged as a global player with the world's fourth largest economy in purchasing power parity terms, and made progress towards achieving most of the Millennium Development Goals. India's integration into the global economy has been accompanied by impressive economic growth that has brought significant economic and social benefits to the country. Nevertheless, disparities in income and human development are on the rise. Preliminary estimates suggest that in 2009–10 the combined all India poverty rate was 32 % compared to 37 % in 2004–05. Going forward, it will be essential for India to build a productive, competitive, and diversified agricultural sector and facilitate rural, non-farm entrepreneurship and employment. Encouraging policies that promote competition in agricultural marketing will ensure that farmers receive better prices."

Productivity

Although India has attained self-sufficiency in food staples, the productivity of its farms is below that of Brazil, the United States, France and other nations. Indian wheat farms, for example, produce about a third of the wheat per hectare per year compared to farms in France. Rice productivity in India was less than half that of China. Other staples productivity in India is similarly low. Indian total factor productivity growth remains below 2% per annum; in contrast, China's total factor productivity growths is about 6% per annum, even though China also has smallholding farmers. Several studies suggest India could eradicate its hunger and malnutrition and be a major source of food for the world by achieving productivity comparable with other countries.

By contrast, Indian farms in some regions post the best yields, for sugarcane, cassava and tea crops.

Crop yields vary significantly between Indian states. Some states produce two to three times more grain per acre than others.

As the map shows, the traditional regions of high agricultural productivity in India are the north west (Punjab, Haryana and Western Uttar Pradesh), coastal districts on both coasts, West Bengal and Tamil Nadu. In recent years, the states of Madhya Pradesh, Jharkhand, Chhattisgarh in central India and Gujarat in the west have shown rapid agricultural growth.

Proposed Solution

Here's a proposed solution for analyzing Crop Production in the Republic of India using Power BI:

Data Collection: Gather relevant data on Crop Production in India from trusted sources like, Government databases. **Data Preparation:** Cleanse and preprocess the data to ensure accuracy and consistency. This may involve handling missing values, standardizing data formats, and merging datasets if necessary. **Data Modeling:** Create a data model in Power BI that includes tables for crop rates, demographic information, regional data, and any other relevant variables. Establish relationships between the tables to facilitate analysis. **Visualization:** Design interactive and informative visualizations to effectively communicate insights. Use charts like line graphs, bar charts, and maps to illustrate trends in unemployment rates over time and across different regions of India. Incorporate slicers and filters to allow users to drill down into specific demographics or time periods. **Dashboard Creation:** Build a comprehensive dashboard that provides an overview of key Crop Production metrics and insights at a

glance. Organize the dashboard layout logically and prioritize the most important information for easy consumption. **Sharing and Collaboration:** Share the Power BI report with stakeholders, policymakers, and other relevant parties to facilitate informed decision- making and drive action towards reducing crop production in India. **Iterative Improvement:** Continuously gather feedback from users and stakeholders to refine the Power BI solution and incorporate additional features or insights as needed.

By following these steps, you can leverage the capabilities of Power BI to create a powerful and insightful analysis of Crop Production.

Feature

- **Introduction Slide:** Provide an overview of the presentation and the importance of analyzing Crop production data in India.
- **Data Sources:** Mention the sources of the Crop production data used in the analysis, such as government websites, international organizations, or research institutions.
- **Data Visualization:** Create visualizations such as line charts, bar graphs, or maps to represent the trend of Production rates over time in India.

Advantages

- **Interactive Visualization:** Power BI allows you to create interactive visualizations such as charts, graphs, and maps, enabling users to explore production data dynamically. This interactivity enhances engagement and facilitates deeper analysis.
- **Real-time Data Integration:** Power BI can integrate with various data sources, including government databases and APIs, allowing you to access and analyze real-time or updated crop production data. This ensures that your analysis is based on the most current information available.
- **Scalability:** Power BI is scalable and can handle large volumes of data. This is crucial for analyzing production data in a populous country like India, where data sets can be extensive and complex.

Scope

The scope of a Power BI presentation for analyzing crop production in the Republic of India is vast and multifaceted. Here's an outline of the potential scope:

Data Collection and Sources: Discuss the various sources of crop production data available in India, including government surveys and international databases .

Data Preparation and Cleaning: Explain the process of collecting, cleaning, and preparing the crop production data for analysis using Power BI. This may involve handling missing values, standardizing formats, and merging datasets from different sources.

Descriptive Analysis: Conduct descriptive analysis to understand the overall crop production in India.

CHAPTER 2

SERVICES AND TOOLS REQUIRED

Services Used

Data Sources: Government databases , International organizations for comparative data. Private sector surveys or datasets from research institutions.

Data Preparation Tools: Excel or CSV files for organizing and cleaning raw data. Power Query Editor within Power BI to shape and transform data before loading it into the model.

Data Analysis Tools: Power BI's built-in analytical capabilities such as DAX (Data Analysis Expressions) for creating calculated columns and measures. Visualization tools like charts, graphs, and maps to illustrate unemployment trends and patterns.

Tools and Software used

Tools:

- **Power BI:** The main tool for this project is Power BI, which will be used to create interactive dashboards for real-time data visualization.
- **Power Query:** This is a data connection technology that enables you to discover, connect, combine, and refine data across a wide variety of sources.

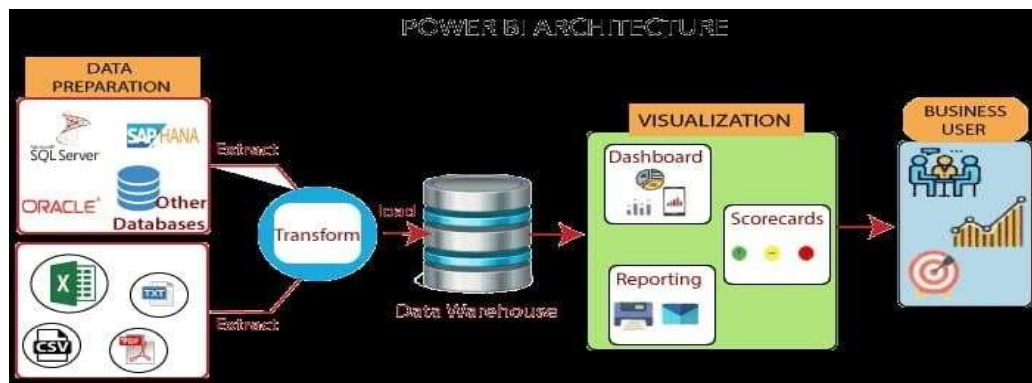
Software Requirements:

- **Power BI Desktop:** This is a Windows application that you can use to create reports and publish them to Power BI.
- **PowerBI Service:** This is an online SaaS (Software as a Service) service that you use to publish reports, create new dashboards, and share insights.
- **PowerBI Mobile:** This is a mobile application that you can use to access your reports and dashboards on the go.

CHAPTER 3

PROJECT ARCHITECTURE

3.1 Architecture



Here's a high-level architecture for the project:

Data Collection and Integration:

Gather data from reliable sources such as government reports, surveys, or databases.

Integrate the collected data into Power BI using data connectors or by importing data from Excel, CSV, or other formats.

Data Cleaning and Transformation:

Clean the data to remove duplicates, handle missing values, and correct inconsistencies.

Transform the data by creating calculated columns, measures, or aggregations that will be useful for analysis.

Dashboard Design:

Create a visually appealing dashboard layout that provides an overview of keyCrop Production.

Include interactive visualizations such as line charts, bar charts, pie charts, maps, and tables to represent various aspects of Crop Production.

Key Performance Indicators (KPIs):

Define KPIs related to crop production, such as the overall production rate.

Display these KPIs prominently on the dashboard to provide at-a-glance insights into the current state of crop production in India.

CHAPTER 4

MODELING AND RESULT

Manage relationship

Data Collection: Gather data on crop production in India from reliable sources such as government reports, surveys, or databases. Ensure that the data includes information on production, year, state, district and area of production individuals.

Data Preparation: Import the collected data into Power BI and prepare it for analysis. This may involve cleaning the data, handling missing values, and formatting the columns appropriately.

Data Modeling: Create a data model in Power BI that includes a table for each variable: state name, district name, crop year, season, area and production of crop production individuals. Establish relationships between these tables based on common fields.

crop production - Power BI

File Home Insert Model View Tools

Clipboard

Get data

Power BI enabled Crop Production Analysis (D...

Power BI enabled Crop Production

Display Options

Power BI enabled Crop Production

RowID State_Name District_Name Crop_Year Season Crop

0 Bihar NALANDA 2005 Rabi Wheat

1 Assam KARBI ANGLONG 2019 Whole Year Onion

2 Gujarat ANAND 2020 Summer Maize

3 Karnataka UTTAR KANNAD 2013 Rabi Groundnut

4 Uttar Pradesh JAUNPUR 2016 Rabi Onion

5 Assam MARIGAON 2014 Rabi Rapeseed & Mustard

6 Odisha SONEPUR 2006 Winter Rapeseed & Mustard

7 Rajasthan DHOLPUR 2017 Whole Year Garlic

8 Karnataka BELGAUM 2018 Whole Year Coconut

9 Bihar MUNGER 2020 Summer Moong(Green)

10 Chhattisgarh JANIGIR-CHAMPA 2013 Kharif Other Kharif

11 Assam KARBI ANGLONG 2019 Rabi Rapeseed & Mustard

12 Uttar Pradesh SHRAVASTI 2005 Kharif Groundnut

13 Gujarat PATAN 2019 Kharif Moong(Green)

14 Tamil Nadu KARUR 2008 Whole Year Sweet potato

15 Uttar Pradesh KASGANJ 2019 Rabi Tobacco

16 Haryana MAHENDRAGARH 2006 Rabi Wheat

17 Assam DHEMAJI 2017 Whole Year Turmeric

18 Assam BAKSA 2015 Kharif Small millets

19 Kerala PATHANAMTHITTA 2008 Whole Year Sugarcane

20 Chhattisgarh JANIGIR-CHAMPA 2018 Rabi Linseed

21 Chhattisgarh DHAMTARI 2020 Whole Year Banana

22 Karnataka BELLARY 2016 Rabi Maize

Load Transform Data Cancel

Visualizations

Build visual

Filters

Add data fields here

Drill through

Cross-report On

Keep all filters On

Add drill-through fields here

Page 1 of 1

crop production - Power Query Editor

File Home Transform Add Column View Tools Help

Close & Apply

New Source

Recent Sources

Enter Data

Data source settings

Manage Parameters

Refresh Preview

Advanced Editor

Choose Columns

Remove Columns

Keep Rows

Remove Rows

Sort

Split Column

Group By

Data Type: Whole Number

Use First Row as Headers

Replace Values

Merge Queries

Append Queries

Combine Files

Text Analytics

Vision

Azure Machine Learning

AI Insights

Queries [1]

Power BI enabled Crop P...

Table.TransformColumnTypes(#Promoted Headers,{"RowID", Int64.Type}, {"State_Name", type text},

1 0 Bihar NALANDA 2005 Rabi Wheat

2 1 Assam KARBI ANGLONG 2019 Whole Year Onion

3 2 Gujarat ANAND 2020 Summer Maize

4 3 Karnataka UTTAR KANNAD 2013 Rabi Groundnut

5 4 Uttar Pradesh JAUNPUR 2016 Rabi Onion

6 5 Assam MARIGAON 2014 Rabi Rapeseed & Mustard

7 6 Odisha SONEPUR 2006 Winter Rapeseed & Mustard

8 7 Rajasthan DHOLPUR 2017 Whole Year Garlic

9 8 Karnataka BELGAUM 2018 Whole Year Coconut

10 9 Bihar MUNGER 2020 Summer Moong(Green)

11 10 Chhattisgarh JANIGIR-CHAMPA 2013 Kharif Other Kharif

12 11 Assam KARBI ANGLONG 2019 Rabi Rapeseed & Mustard

13 12 Uttar Pradesh SHRAVASTI 2005 Kharif Groundnut

14 13 Gujarat PATAN 2019 Kharif Moong(Green)

15 14 Tamil Nadu KARUR 2008 Whole Year Sweet potato

16 15 Uttar Pradesh KASGANJ 2019 Rabi Tobacco

17 16 Haryana MAHENDRAGARH 2006 Rabi Wheat

18 17 Assam DHEMAJI 2017 Whole Year Turmeric

19 18 Assam BAKSA 2015 Kharif Small millets

20 19 Kerala PATHANAMTHITTA 2008 Whole Year Sugarcane

21 20 Chhattisgarh JANIGIR-CHAMPA 2018 Rabi Linseed

22 21 Chhattisgarh DHAMTARI 2020 Whole Year Banana

23 22 Karnataka BELLARY 2016 Rabi Maize

24

Query Settings

PROPERTIES

Name

Power BI enabled Crop Production

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Column headers based on row 1000 max

crop production - Power BI Desktop

File Home Help Table tools Column tools

Name: Season Format: Text Summarization: Don't summarize Data category: Uncategorized Sort by column: Sort Data groups: Groups Manage relationships: Relationships New column: Calculations

RowID	State_Name	District_Name	Crop_Year	Season	Crop	Area	Production
27760	Odisha	JHARSUGUDA	2012	Autumn	Groundnut	160	10300.00%
27647	Odisha	JAJAPUR	2021	Autumn	Groundnut	89	11570.00%
27602	Odisha	BALANGIR	2017	Autumn	Groundnut	5069	478510.00%
27483	Odisha	KANDHAMAL	2022	Autumn	Groundnut	159	16540.00%
27358	Odisha	BOUDH	2013	Autumn	Ragi	7	360.00%
27274	Odisha	JAJAPUR	2018	Autumn	Jute	730	755500.00%
26970	Odisha	DEOGARH	2021	Autumn	Moong(Green Gram)	43	1140.00%
26814	Odisha	BALANGIR	2021	Autumn	Urad	6759	242650.00%
26685	Odisha	DEOGARH	2014	Autumn	Moong(Green Gram)	1946	45150.00%
26523	Odisha	SUNDARGARH	2016	Autumn	Ragi	357	24810.00%
26222	Odisha	KENDUJHAR	2015	Autumn	Groundnut	81	4580.00%
26069	Odisha	SAMBALPUR	2006	Autumn	Moong(Green Gram)	539	14300.00%
25957	Odisha	NAVAGARH	2006	Autumn	Urad	162	3200.00%
25887	Odisha	BALESHWAR	2013	Autumn	Jute	302	210200.00%
25372	Odisha	SUNDARGARH	2012	Autumn	Groundnut	414	36560.00%
24846	Odisha	KHORDHA	2014	Autumn	Sesamum	1	10.00%
24696	Odisha	SUNDARGARH	2014	Autumn	Groundnut	665	70020.00%
24688	Odisha	BOUDH	2014	Autumn	Sesamum	8	170.00%
24518	Odisha	BOUDH	2019	Autumn	Sesamum	13	120.00%
24474	Odisha	SUNDARGARH	2013	Autumn	Ragi	202	11470.00%
24246	Odisha	GANJAM	2019	Autumn	Sesamum	69	1200.00%
23908	Odisha	GANJAM	2018	Autumn	Groundnut	2048	227120.00%
23511	Odisha	NUAPADA	2014	Autumn	Groundnut	570	44690.00%

Table: Power BI enabled Crop Production (73.937 rows: 1.401 filtered rows) Column: Season (6 distinct values: 1 filtered distinct values)

crop production - Power BI Desktop

File Home Help Table tools Column tools

Name: Season Format: Text Summarization: Don't summarize Data category: Uncategorized Sort by column: Sort Data groups: Groups Manage relationships: Relationships New column: Calculations

RowID	State_Name	District_Name	Crop_Year	Season	Crop	Area	Production
37863	Nagaland	MOKOKCHUNG	2012	Rabi	Masoor	220	9000.00%
37674	Punjab	HOSHIARPUR	2011	Rabi	Masoor	700	30000.00%
37521	Punjab	NAWANSHAHR	2011	Rabi	Masoor	200	10000.00%
37268	Punjab	AMRITSAR	2012	Rabi	Masoor	300	0.00%
36768	Rajasthan	BHILWARA	2018	Rabi	Masoor	6194	573100.00%
36725	Nagaland	KOHIMA	2011	Rabi	Masoor	120	7000.00%
36324	Nagaland	KOHIMA	2014	Rabi	Masoor	490	59000.00%
35989	Punjab	HOSHIARPUR	2017	Rabi	Masoor	300	10000.00%
35452	Nagaland	DIMAPUR	2017	Rabi	Masoor	450	32000.00%
35211	Rajasthan	BUNDI	2006	Rabi	Masoor	3119	164400.00%
34678	Tripura	NORTH TRIPURA	2020	Rabi	Masoor	41	2700.00%
34549	Nagaland	ZUNHEBOTO	2013	Rabi	Masoor	270	67000.00%
34129	Rajasthan	CHURU	2009	Rabi	Masoor	3	800.00%
33856	Rajasthan	HANUMANGARH	2008	Rabi	Masoor	2	
33501	Odisha	KENDUJHAR	2012	Rabi	Masoor	1900	77000.00%
33452	Himachal Pradesh	KANGRA	2014	Rabi	Masoor	92	6800.00%
33216	Rajasthan	CHITTORGARH	2010	Rabi	Masoor	338	22700.00%
32856	Rajasthan	BHARATPUR	2012	Rabi	Masoor	15803	1640400.00%
32562	Punjab	AMRITSAR	2010	Rabi	Masoor	500	30000.00%
31687	Rajasthan	BUNDI	2007	Rabi	Masoor	2150	241900.00%
31567	Meghalaya	WEST GARO HILLS	2018	Rabi	Masoor	305	25500.00%
30747	Rajasthan	HANUMANGARH	2007	Rabi	Masoor	2	100.00%
30073	Rajasthan	JALORE	2017	Rabi	Masoor	2	200.00%

Table: Power BI enabled Crop Production (73.827 rows: 20.171 filtered rows) Column: Season (6 distinct values: 1 filtered distinct values)

crop production - Power BI Desktop

File Home Help Table tools Column tools

Name: Crop Format: Text

Data type: Text

Summarization: Don't summarize

Data category: Uncategorized

Sort by column: Sort

Data groups: Groups

Manage relationships: Relationships

New column: Calculations

RowID	State_Name	District_Name	Crop_Year	Season	Crop	Area	Production
27775	Tamil Nadu	DINDIGUL	2011	Whole Year	Apple	4	0.00%
21253	Tamil Nadu	DINDIGUL	2010	Whole Year	Apple	3	0.00%

Table: Power BI enabled Crop Production (73.837 rows, 3 filtered rows) Columns: Crop (133 distinct values), 1 filtered distinct values

crop production - Power BI Desktop

File Home Help Table tools Column tools

Name: Crop Format: Text

Data type: Text

Summarization: Don't summarize

Data category: Uncategorized

Sort by column: Sort

Data groups: Groups

Manage relationships: Relationships

New column: Calculations

RowID	State_Name	District_Name	Crop_Year	Season	Crop	Area	Production
72431	Andaman and Ni	NICOBARS	2018	Whole Year	Coconut	14560	7130000000.00%
71237	Andaman and Ni	SOUTH ANDAMANS	2012	Whole Year	Coconut	7156.7	3475000000.00%
63553	Puducherry	KARAIKAL	2021	Whole Year	Coconut	205	615000000.00%
63437	Andaman and Ni	NORTH AND MIDDLE AND	2008	Whole Year	Coconut	6992	2390000000.00%
57821	Goa	NORTH GOA	2012	Whole Year	Coconut	11083	5441000000.00%
53122	Puducherry	YANAM	2021	Whole Year	Coconut	284	412400000.00%
51885	Puducherry	MAHE	2013	Whole Year	Coconut	487	438300000.00%
49406	Puducherry	YANAM	2019	Whole Year	Coconut	286	429500000.00%
48588	Andaman and Ni	SOUTH ANDAMANS	2013	Whole Year	Coconut	7050.45	2643000000.00%
47720	Goa	SOUTH GOA	2021	Whole Year	Coconut	14371	71700.00%
46985	Goa	SOUTH GOA	2013	Whole Year	Coconut	14157	7011000000.00%
43410	Puducherry	MAHE	2017	Whole Year	Coconut	472	387000000.00%
38671	Goa	NORTH GOA	2013	Whole Year	Coconut	11155	5523000000.00%
38617	Andaman and Ni	NORTH AND MIDDLE AND	2018	Whole Year	Coconut	3668	1270000000.00%
37335	Puducherry	KARAIKAL	2010	Whole Year	Coconut	214	267500000.00%
35399	Andaman and Ni	NICOBARS	2008	Whole Year	Coconut	18168	6510000000.00%
34732	Puducherry	YANAM	2010	Whole Year	Coconut	313	313000000.00%
33968	Goa	NORTH GOA	2022	Whole Year	Coconut	11399	56400.00%
30399	Puducherry	MAHE	2019	Whole Year	Coconut	470	444200000.00%
26480	Puducherry	MAHE	2007	Whole Year	Coconut	490	588000000.00%
25751	Puducherry	KARAIKAL	2022	Whole Year	Coconut	192	184300000.00%
20498	Goa	NORTH GOA	2015	Whole Year	Coconut	11249	5616000000.00%
18625	Puducherry	PONDICHERRY	2012	Whole Year	Coconut	1131	1781300000.00%

Table: Power BI enabled Crop Production (73.837 rows, 703 filtered rows) Columns: Crop (133 distinct values), 3 filtered distinct values

crop production - Power BI Desktop

File Home Help Table tools Column tools

Name: State_Name Format: Text Summarization: Don't summarize Data category: Uncategorized

Data type: Text

Structure Formatting Properties Sort Data groups Relationships Calculations

RowID	State_Name	District_Name	Crop_Year	Season	Crop	Area	Production
71458	Tamil Nadu	COIMBATORE	2008	Kharif	Jowar	74450	3565000.00%
71450	Tamil Nadu	TIRUNELVELU	2006	Kharif	Maize	3863	209800.00%
71399	Tamil Nadu	DHARMAPURI	2012	Kharif	Other Kharif pulses	6809	142200.00%
71131	Tamil Nadu	MADURAI	2021	Kharif	Onion	193	188700.00%
71112	Tamil Nadu	PUDUKKOTTAI	2006	Kharif	Total foodgrain	130913	3858400.00%
71071	Tamil Nadu	VELLORE	2013	Kharif	Sunflower	89	11000.00%
71023	Tamil Nadu	KRISHNAGIRI	2016	Kharif	Small millets	1566	116600.00%
70936	Tamil Nadu	RAMANATHAPURAM	2013	Kharif	Sesamum	1638	28900.00%
70822	Tamil Nadu	TUTICORIN	2020	Kharif	Urad	29630	486500.00%
70714	Tamil Nadu	RAMANATHAPURAM	2013	Kharif	Urad	2048	54200.00%
70705	Tamil Nadu	KRISHNAGIRI	2021	Kharif	Horse-gram	924	54000.00%
70666	Tamil Nadu	THIRUVALLUR	2020	Kharif	Sunflower	22	2200.00%
70465	Tamil Nadu	THIRUVALLUR	2013	Kharif	Sunflower	161	20000.00%
70434	Tamil Nadu	MADURAI	2012	Kharif	Maize	826	163700.00%
70429	Tamil Nadu	NAMAKKAL	2009	Kharif	Sunflower	526	85000.00%
70355	Tamil Nadu	THIRUVALLUR	2020	Kharif	Horse-gram	36	1400.00%
70305	Tamil Nadu	DHARMAPURI	2009	Kharif	Ragi	74452	11759000.00%
70270	Tamil Nadu	TIRUCHIRAPPALLI	2021	Kharif	Sunflower	433	86000.00%
70229	Tamil Nadu	ERODE	2010	Kharif	Jowar	3383	181100.00%
70157	Tamil Nadu	DHARMAPURI	2018	Kharif	Moong(Green Gram)	694	43500.00%
70109	Tamil Nadu	SIVAGANGA	2020	Kharif	Maize	30	10400.00%
70106	Tamil Nadu	THIRUVALLUR	2013	Kharif	Sesamum	1611	69700.00%
69967	Tamil Nadu	VILLUPURAM	2010	Kharif	Korra	260	8800.00%

Table: Power BI enabled Crop Production (73,937 rows, 3,003 filtered rows) Column: State_Name (23 distinct values, 1 filtered distinct values)

crop production - Power BI Desktop

File Home Help Table tools Column tools

Name: Crop Format: Text Summarization: Don't summarize Data category: Uncategorized

Data type: Text

Structure Formatting Properties Sort Data groups Relationships Calculations

RowID	State_Name	District_Name	Crop_Year	Season	Crop	Area	Production
72793	Uttar Pradesh	UNNAO	2021	Summer	Banana	17	74000.00%
72456	Uttar Pradesh	ETAH	2019	Summer	Banana	2	8700.00%
70761	Uttar Pradesh	MUZAFFARNAGAR	2017	Summer	Banana	9	37000.00%
70563	Uttar Pradesh	BARABANKI	2019	Summer	Banana	27	118000.00%
69040	Uttar Pradesh	SANT KABEER NAGAR	2020	Summer	Banana	29	129500.00%
65721	Uttar Pradesh	MAHARAJGANJ	2020	Summer	Banana	159	710000.00%
65242	Uttar Pradesh	AURAIYA	2016	Summer	Banana	1	3800.00%
64129	Uttar Pradesh	BUDAUN	2020	Summer	Banana	5	22300.00%
63033	Uttar Pradesh	SANT KABEER NAGAR	2021	Summer	Banana	31	135000.00%
62194	Uttar Pradesh	ALIGARH	2016	Summer	Banana	2	7700.00%
61147	Uttar Pradesh	HATHRAS	2019	Summer	Banana	1	4400.00%
57699	Uttar Pradesh	SHRAVASTI	2019	Summer	Banana	10	43700.00%
56014	Uttar Pradesh	UNNAO	2022	Summer	Banana	4	18000.00%
54326	Uttar Pradesh	LUCKNOW	2021	Summer	Banana	77	325300.00%
53617	Uttar Pradesh	KUSHI NAGAR	2020	Summer	Banana	435	1942400.00%
53588	Uttar Pradesh	FATEHPUR	2022	Summer	Banana	214	965400.00%
53330	Uttar Pradesh	SULTANPUR	2017	Summer	Banana	22	90500.00%
53313	Uttar Pradesh	PILIBHIT	2017	Summer	Banana	6	24700.00%
52651	Uttar Pradesh	SIDDHARTH NAGAR	2016	Summer	Banana	1	3800.00%
51974	Uttar Pradesh	SHRAVASTI	2022	Summer	Banana	7	31600.00%
50628	Uttar Pradesh	GONDA	2022	Summer	Banana	39	175900.00%
47946	Uttar Pradesh	MORADABAD	2017	Summer	Banana	4	16400.00%
45401	Uttar Pradesh	BARABANKI	2020	Summer	Banana	29	129500.00%

Table: Power BI enabled Crop Production (73,827 rows, 997 filtered rows) Column: Crop (122 distinct values, 1 filtered distinct values)

crop production - Power BI Desktop

File Home Help Table tools Column tools

Name: State_Name Data type: Text Format: Text Summarization: Don't summarize Data category: Uncategorized Sort by column: Sort Data groups: Manage relationships New column: Calculations

RowID	State_Name	District_Name	Crop_Year	Season	Crop	Area	Production
72535	Kerala	PALAKKAD	2009	Whole Year	Dry ginger	1452	647800.00%
72505	Kerala	ALAPPUZHA	2019	Whole Year	Cashewnut	2559.81	54769.00%
72426	Kerala	IDUKKI	2014	Whole Year	Tapioca	7141	23084200.00%
72068	Kerala	IDUKKI	2022	Whole Year	Maize	2	500.00%
71893	Kerala	ERNAKULAM	2012	Whole Year	Arecanut	5679	424500.00%
71891	Kerala	THRISSUR	2021	Whole Year	Blackgram	2	
71842	Kerala	ERNAKULAM	2009	Whole Year	Black pepper	7941	121900.00%
71791	Kerala	KOTTAYAM	2019	Whole Year	Tapioca	5957.23	21134385.00%
71602	Kerala	ERNAKULAM	2020	Whole Year	Tapioca	5443	21155000.00%
71469	Kerala	KOTTAYAM	2014	Whole Year	Turmeric	169	40100.00%
71439	Kerala	KOZHICODE	2011	Whole Year	Turmeric	366	85100.00%
71423	Kerala	KASARAGOD	2021	Whole Year	Drum Stick	548	52800.00%
71369	Kerala	MALAPPURAM	2012	Whole Year	Coconut	113162	9000000000.00%
71364	Kerala	ERNAKULAM	2010	Whole Year	Arecanut	4886	372800.00%
71302	Kerala	PALAKKAD	2011	Whole Year	Arecanut	5963	661500.00%
71275	Kerala	KOLLAM	2010	Whole Year	Cashewnut Raw	4663	304300.00%
71162	Kerala	KOZHICODE	2021	Whole Year	Turmeric	301	72900.00%
70930	Kerala	KOZHICODE	2020	Whole Year	Tapioca	1824	4320800.00%
70898	Kerala	KOLLAM	2007	Whole Year	Tapioca	25678	47070500.00%
70895	Kerala	IDUKKI	2017	Whole Year	Sweet potato	4	4600.00%
70820	Kerala	KOZHICODE	2013	Whole Year	Coconut	129500	8450000000.00%
70813	Kerala	IDUKKI	2019	Whole Year	Arecanut	2708.92	250734.00%
70802	Kerala	KASARAGOD	2012	Whole Year	Dry ginger	104	34000.00%

Table: Power BI enabled Crop Productio (73,827 rows, 1,289 filtered rows) Column: State_Name (33 distinct values, 1 filtered distinct values)

crop production - Power Query Editor

File Home Transform Add Column View Tools Help

Close & Apply New Recent Enter Data Data source settings Manage Parameters Refresh Preview Advanced Editor Choose Remove Columns + Columns + Manage Columns Keep Remove Rows + Rows + Split Column Group By Replace Values Data Type: Whole Number Use First Row as Headers Merge Queries Append Queries Combine Files Combine Text Analytics Vision Azure Machine Learning AI Insights

Queries [1] Power BI enabled Crop P...

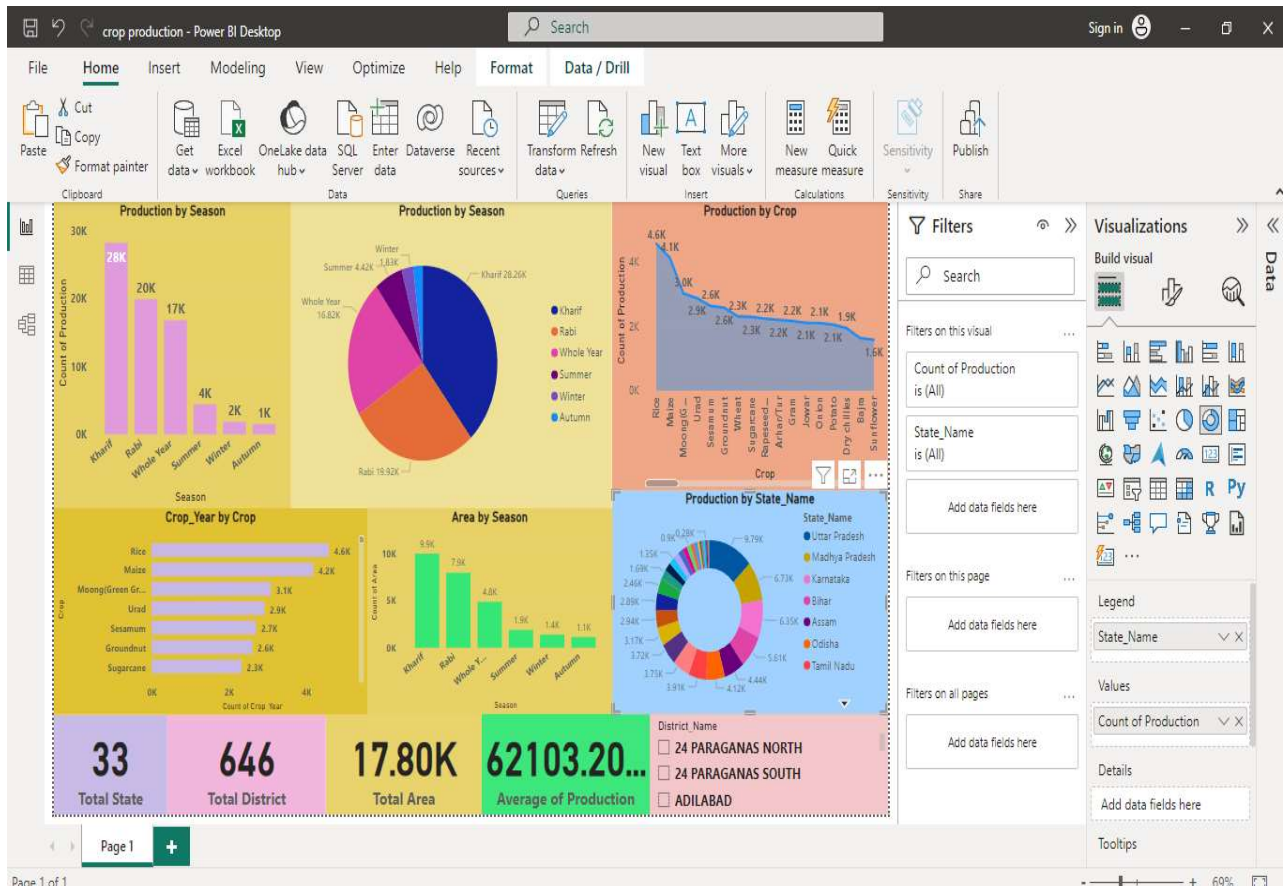
Table.TransformColumnTypes(#"Promoted Headers",{"RowID", Int64.Type}, {"State_Name", type text},

RowID	State_Name	District_Name	Crop_Year	Season	Crop
1	Bihar	NALANDA	2005	Rabi	Wheat
2	Assam	KARBI ANGLONG	2019	Whole Year	Onion
3	Gujarat	ANAND	2020	Summer	Maize
4	Karnataka	UTTAR KANNAD	2013	Rabi	Groundnut
5	Uttar Pradesh	JAINPUR	2016	Rabi	Onion
6	Assam	MARIGAON	2014	Rabi	Rapeseed &f
7	Odisha	SONEPUR	2006	Winter	Rapeseed &f
8	Rajasthan	DHOLPUR	2017	Whole Year	Garlic
9	Karnataka	BELGAUM	2018	Whole Year	Coconut
10	Bihar	MUNGER	2020	Summer	Moong/Gree
11	Chhattisgarh	JANUGIR-CHAMPA	2013	Kharif	Other Kharif
12	Assam	KARBI ANGLONG	2019	Rabi	Rapeseed &f
13	Uttar Pradesh	SHRAVASTI	2005	Kharif	Groundnut
14	Gujarat	PATAN	2019	Kharif	Moong/Gree
15	Tamil Nadu	KARUR	2008	Whole Year	Sweet potat
16	Uttar Pradesh	KASGANI	2019	Rabi	Tobacco
17	Haryana	MAHENDRAGARH	2006	Rabi	Wheat
18	Assam	DHEMAJI	2017	Whole Year	Turmeric
19	Assam	BAKSA	2015	Kharif	Small millets
20	Kerala	PATHANAMTHITTA	2008	Whole Year	Sugarcane
21	Chhattisgarh	JANUGIR-CHAMPA	2018	Rabi	Linseed
22	Chhattisgarh	DHAMIARI	2020	Whole Year	Banana
23	Karnataka	BELLARY	2016	Rabi	Maize

8 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

PREVIEW DOWNLOADED ON SATURDAY

Dashboard



CONCLUSION

The project “Real-Time Analysis of Crop Production” using PowerBI has successfully demonstrated the potential of data analytics in the agricultural sector. The agricultural sector is of vital importance for the region. The interactive dashboards and reports have offered a comprehensive view of Production data. The project has also highlighted the importance of data visualization in making complex data more understandable and accessible. The use of PowerBI has made it possible to present data in a visually appealing and easy-to-understand format, thereby aiding in better decision-making.

FUTURE SCOPE

The future scope of this project is vast. With the advent of advanced analytics and machine learning, PowerBI can be leveraged to predict future trends based on historical data. Furthermore, PowerBI's capability to integrate with various data sources opens up the possibility of incorporating more diverse datasets for a more holistic view of data. Additionally, the project could explore the integration of real-time data streams to provide even more timely and relevant data.

REFERENCES

https://en.wikipedia.org/wiki/Agriculture_in_India

Link

<https://github.com/Abi-0606/CropProduction>