A PROJECT REPORT

INDIA'S AGRICULTURAL CROP PRODUCTION ANALYSIS (1997-2021)

Fundamentals of Data Analytics with Tableau – Smartbridge

Project Based Experiential Learning Program-Naan Mudhalvan

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(Autonomous)

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DEPARTMENT OF STATISTICS

(2023-24)

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PROJECT GUIDE

Mrs. T. UMA

ASSISTANT PROFESSOR

1.INTRODUCTION

1.1Over view

India's agricultural crop production has undergone significant changes and fluctuations from 1997 to 2021. Several factors have influenced these trends, including climate variations, technological advancements, policy changes, and shifts in consumer preferences. Here is an overview of India's agricultural crop production during this period:

Overall Growth:

India has seen a substantial increase in agricultural crop production during this period. This growth can be attributed to factors like the Green Revolution, increased use of modern agricultural practices, and the expansion of irrigation facilities. The country has made significant progress in achieving self-sufficiency in food production.

Cereals:

Cereal crops, including rice, wheat, and maize, have been the backbone of India's agriculture. Wheat production has seen a consistent increase, making India one of the largest wheat producers globally. Rice production has also grown steadily.

Oilseeds:

India has made substantial progress in oilseed production, particularly in crops like soybeans, groundnuts, and sunflower seeds. This has helped reduce the country's dependence on edible oil imports.

Fruits and Vegetables:

The production of fruits and vegetables has expanded due to changing dietary preferences and urbanization. Mangoes, bananas, tomatoes, and onions are among the most produced crops in this category.

Commercial Crops:

India has also seen an increase in the production of cash crops like cotton, sugarcane, and tobacco. These crops play a vital role in the country's economy.

Challenges and Constraints:

Despite overall growth, Indian agriculture faces several challenges, including inadequate infrastructure, post-harvest losses, water scarcity, pest and disease outbreaks, and the impact of climate change. Farmers also face issues related to market access and pricing.

Government Initiatives:

The Indian government has implemented various schemes and policies to support agricultural growth, such as the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) for income support to farmers, the Pradhan Mantri Fasal Bima Yojana (PMFBY) for crop insurance, and the National Mission on Sustainable Agriculture (NMSA) to promote sustainable farming practices.

Exports:

India has become a significant exporter of agricultural products like rice, wheat, spices, and fruits. International markets provide opportunities for Indian farmers to expand their income sources

In summary, India's agricultural crop production from 1997 to 2021 has shown significant growth and diversification, driven by a combination of factors. However, the sector still faces various challenges that need to be addressed to ensure sustainable and inclusive growth in the future. Government policies and technological advancements will continue to play a vital role in shaping the trajectory of India's agriculture.

1.2 Purpose

A project focused on India's Agricultural Crop Production Analysis (1997-2021) can have several valuable uses and benefits for various stakeholders, including government bodies, researchers, farmers, and policymakers. Here are some of the key uses of such a project:

Policy Formulation and Evaluation:

The analysis can serve as a basis for formulating and evaluating agricultural policies. Government agencies can use the insights gained from historical data to design more effective policies to address issues such as food security, sustainability, and rural development.

Data-Driven Decision-Making:

Policymakers and government officials can make data-driven decisions by using the project's findings to allocate resources, prioritize interventions, and set agricultural development goals.

Enhancing Food Security:

The project can help identify trends in the production of essential food crops, enabling timely interventions to ensure food security for India's growing population.

Risk Management:

Farmers and agricultural stakeholders can use the project's findings to assess and manage risks related to climate change, pests, diseases, and market fluctuations.

Market Insights:

Traders, investors, and businesses can benefit from market insights derived from crop production data, helping them make informed decisions regarding commodity trading, pricing, and marketing.

Income Improvement:

By understanding historical trends in crop production and income levels, efforts can be directed toward improving the livelihoods of farmers, particularly in regions where income disparities exist.

Climate Change Adaptation:

The analysis can provide critical information for developing climate change adaptation strategies, enhancing the resilience of Indian agriculture in the face of changing weather patterns.

Trade Strategy:

The project can guide India's trade and export strategy by identifying commodities with export potential, boosting foreign exchange earnings and supporting the agricultural export sector.

Research and Development:

Researchers and agricultural institutions can use the project's data to identify areas for further research and development, leading to innovations that improve crop yields and reduce post-harvest losses.

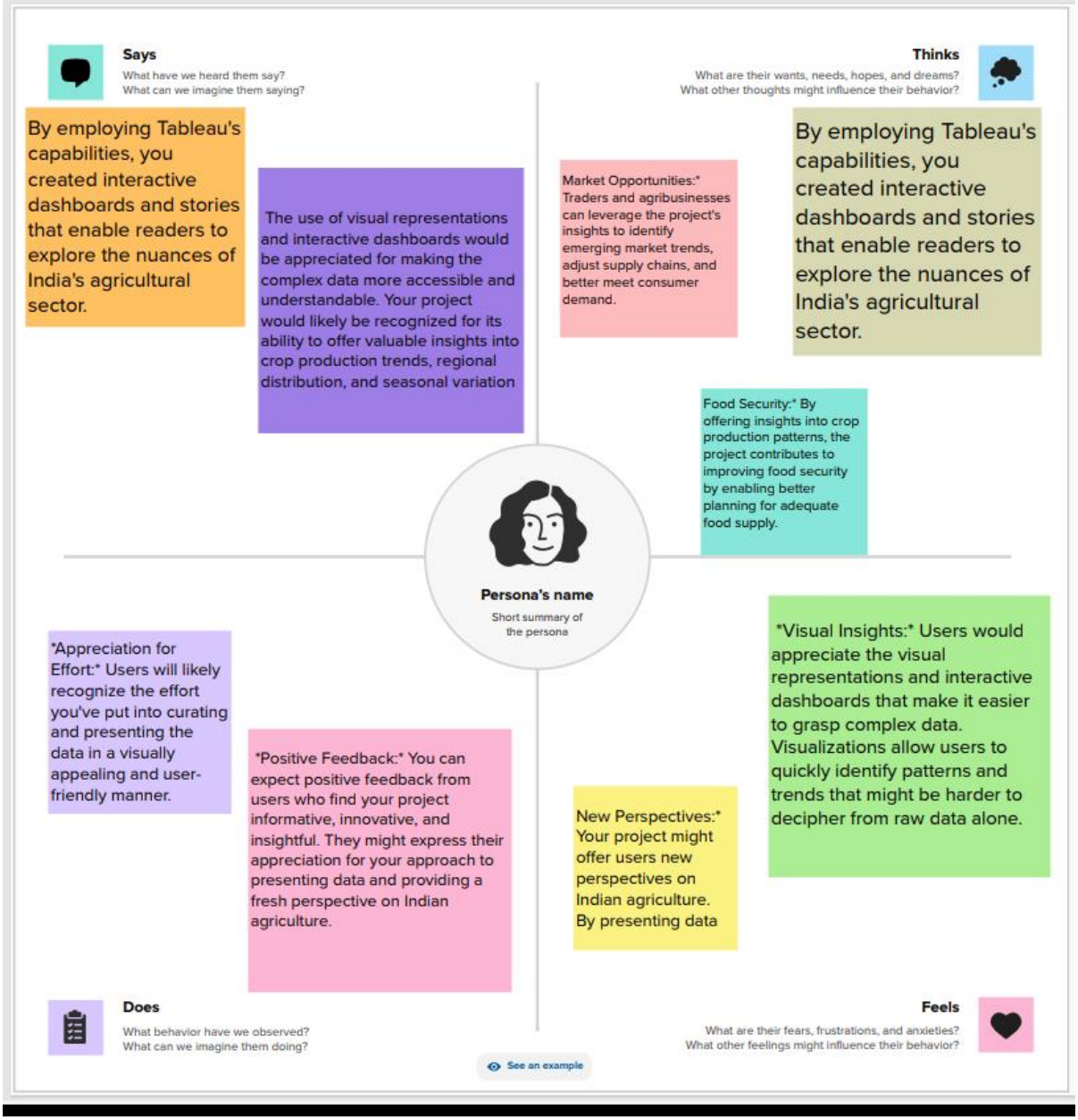
Education and Awareness:

The project's findings can be used to educate farmers and stakeholders about best practices, market opportunities, and potential risks in the agricultural sector, fostering awareness and informed decision-making

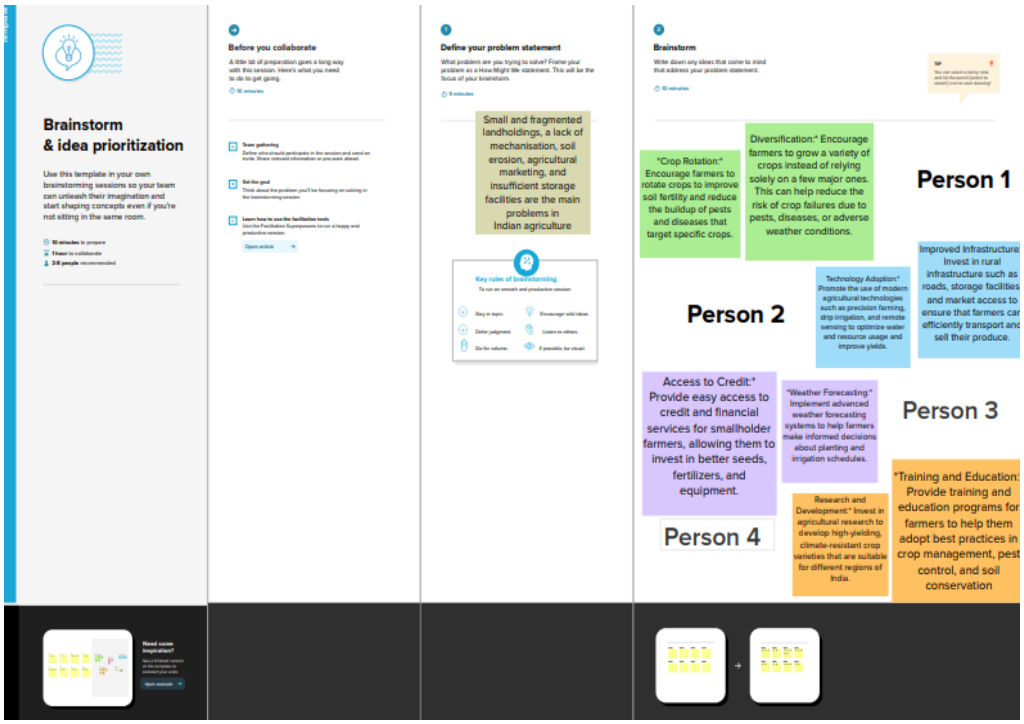
In summary, a project focused on analyzing India's agricultural crop production from 1997 to 2021 serves a wide range of practical purposes, from informing policy decisions and enhancing food security to promoting sustainability and supporting the well-being of farmers. It provides a comprehensive understanding of the agricultural sector, enabling stakeholders to make more informed and effective choices and we can achieve several important objectives and outcomes, benefiting various stakeholders and contributing to the overall development and sustainability of the agricultural sector in India.

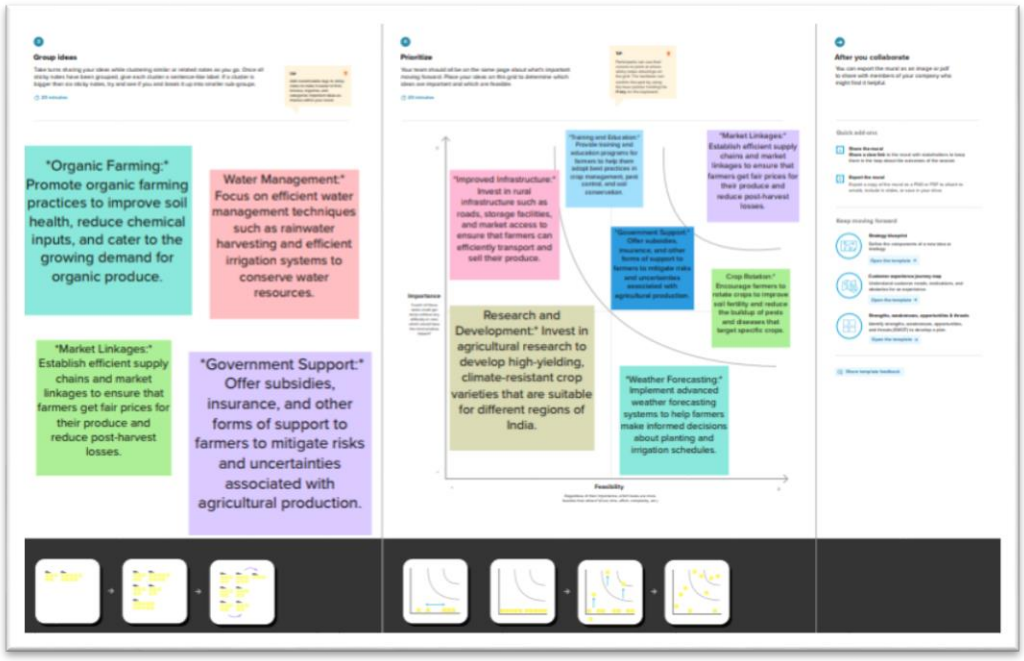
2.PROBLEM DEFINITION & DESIGN THINKING

2.1 Empathy Map



2.2 Ideation & Brainstorming map





3. RESULT

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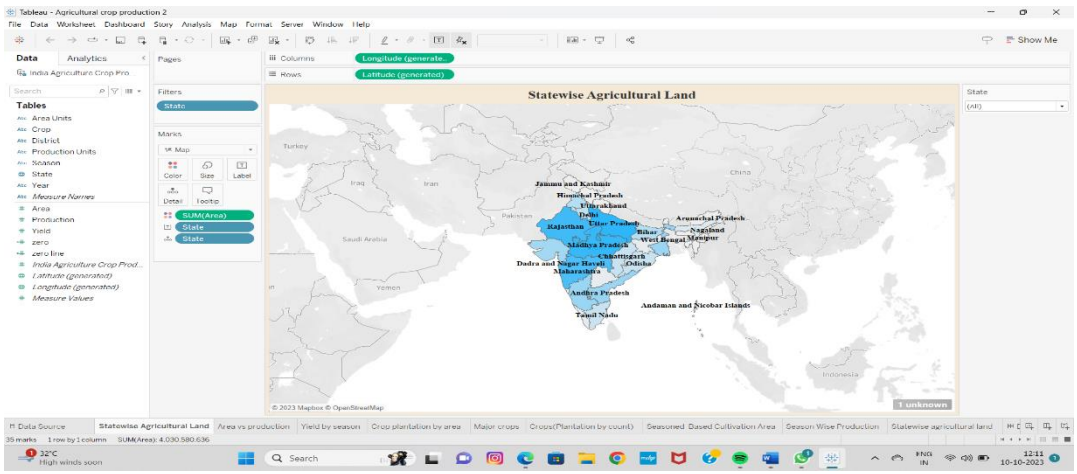

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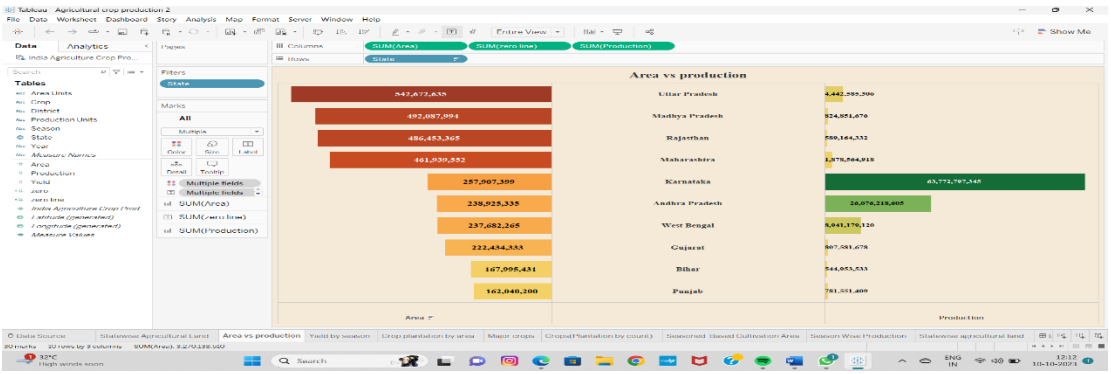
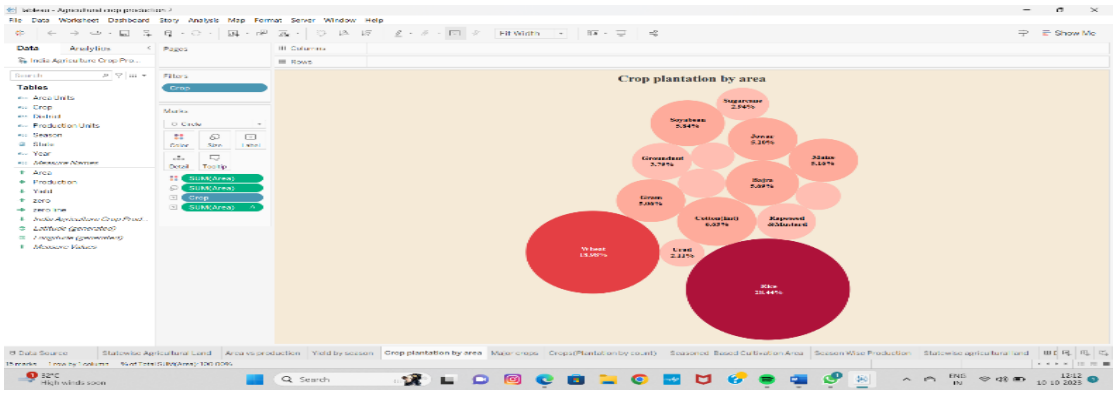


Sheet 3

Sheet 4



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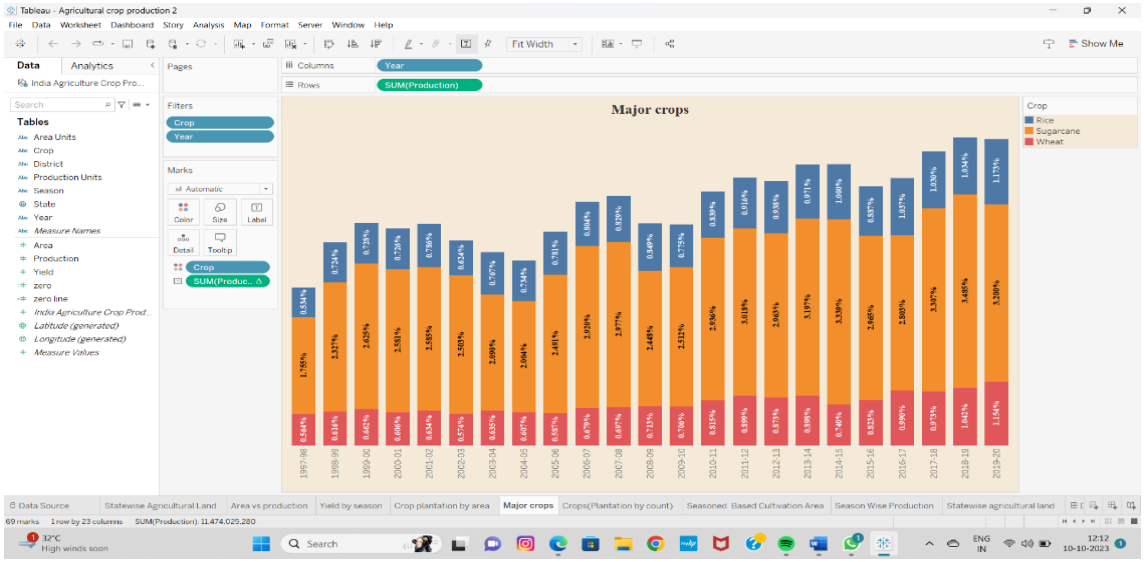

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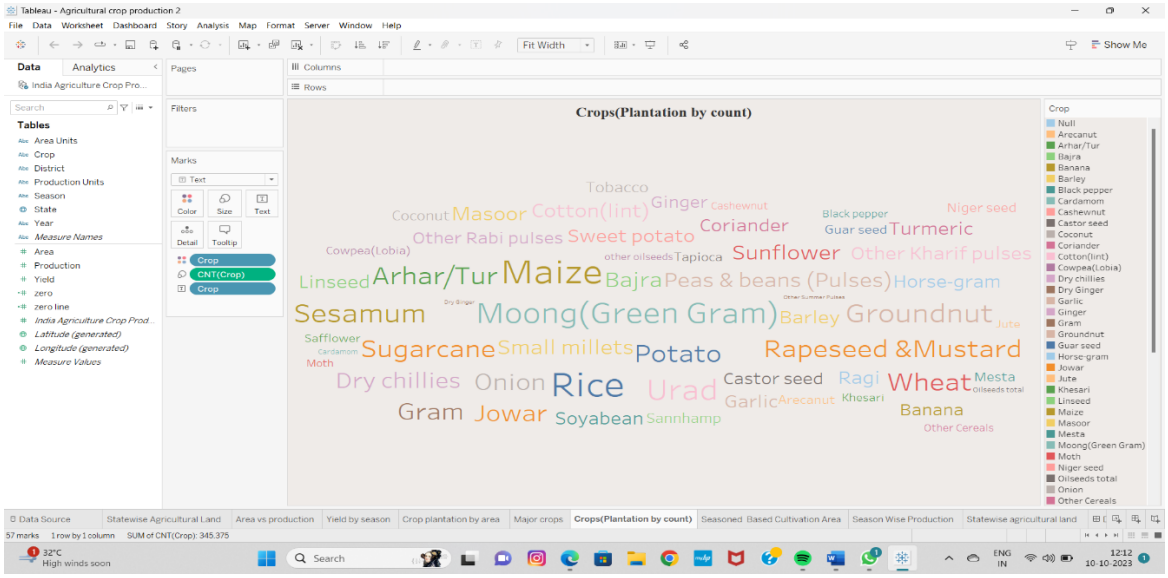

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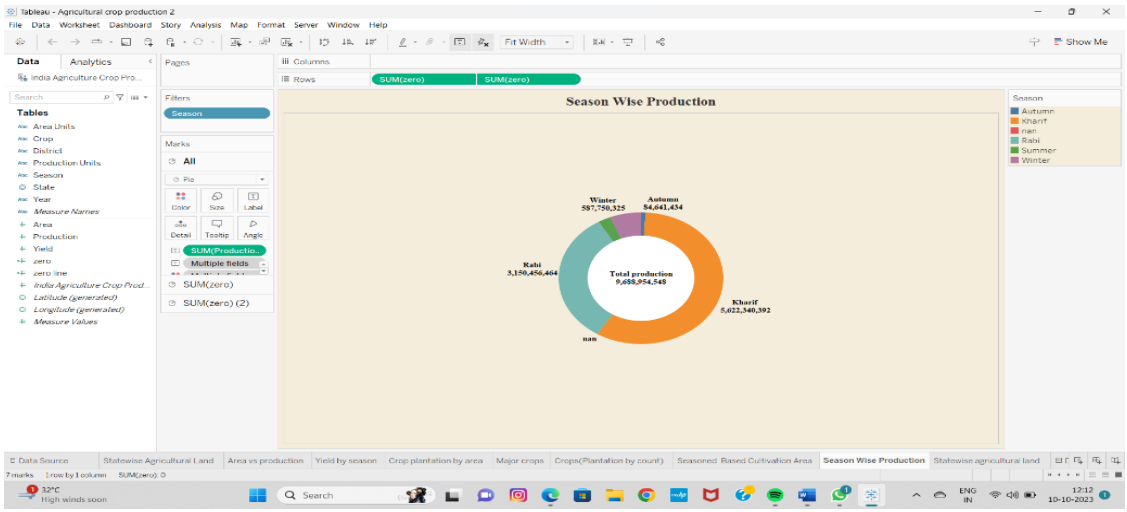

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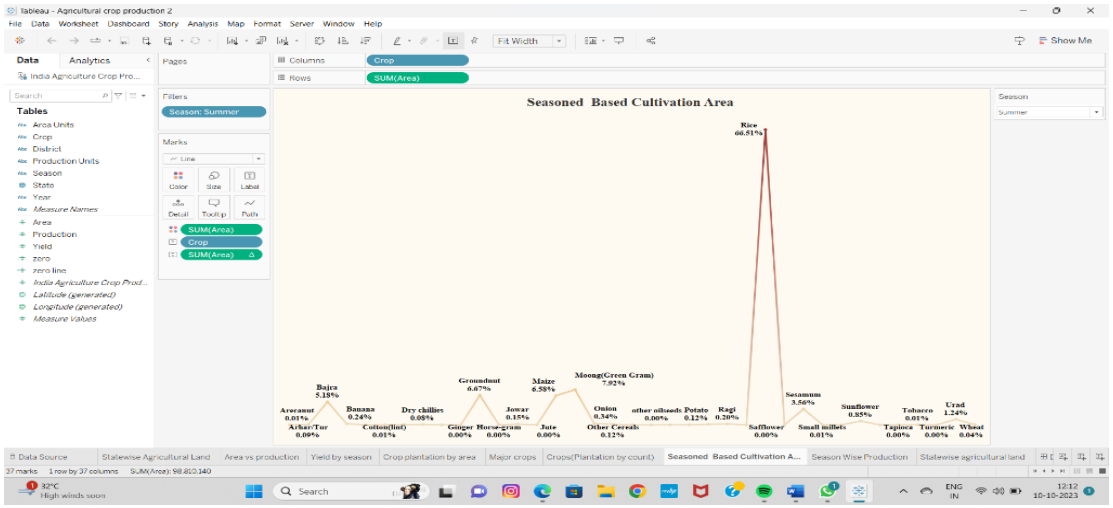

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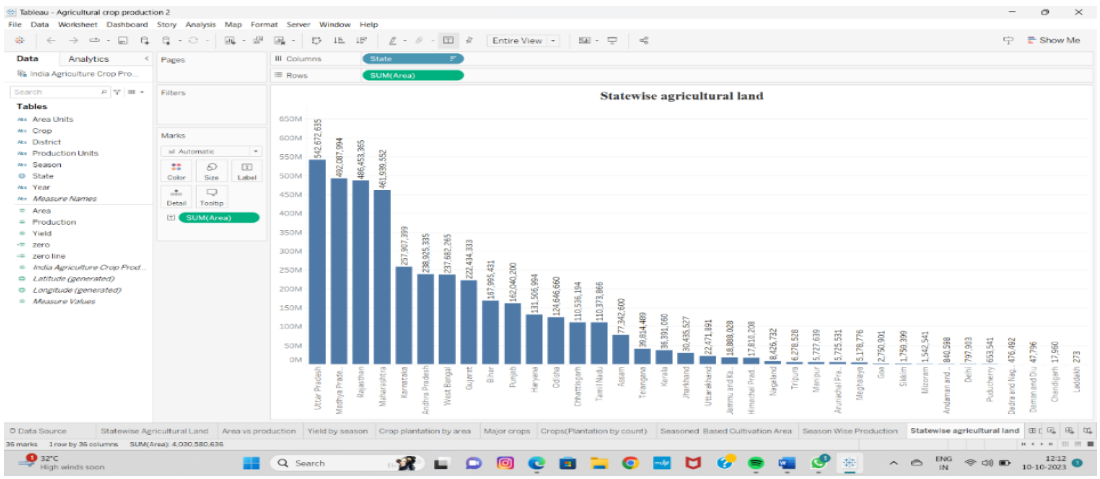
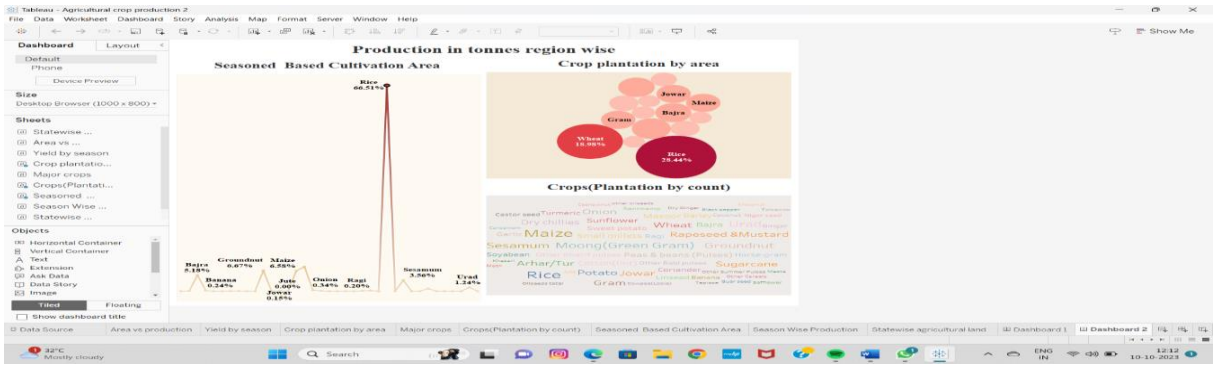
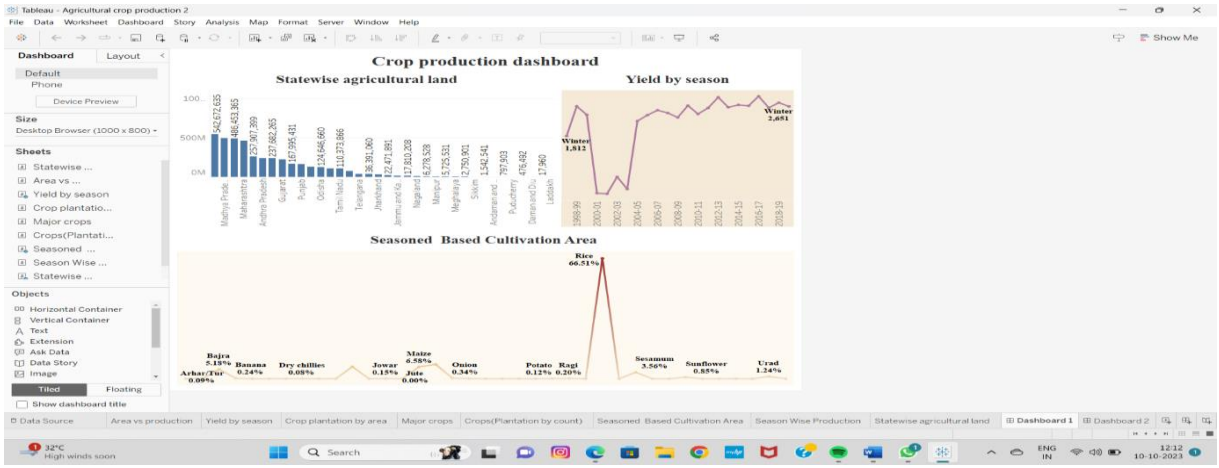


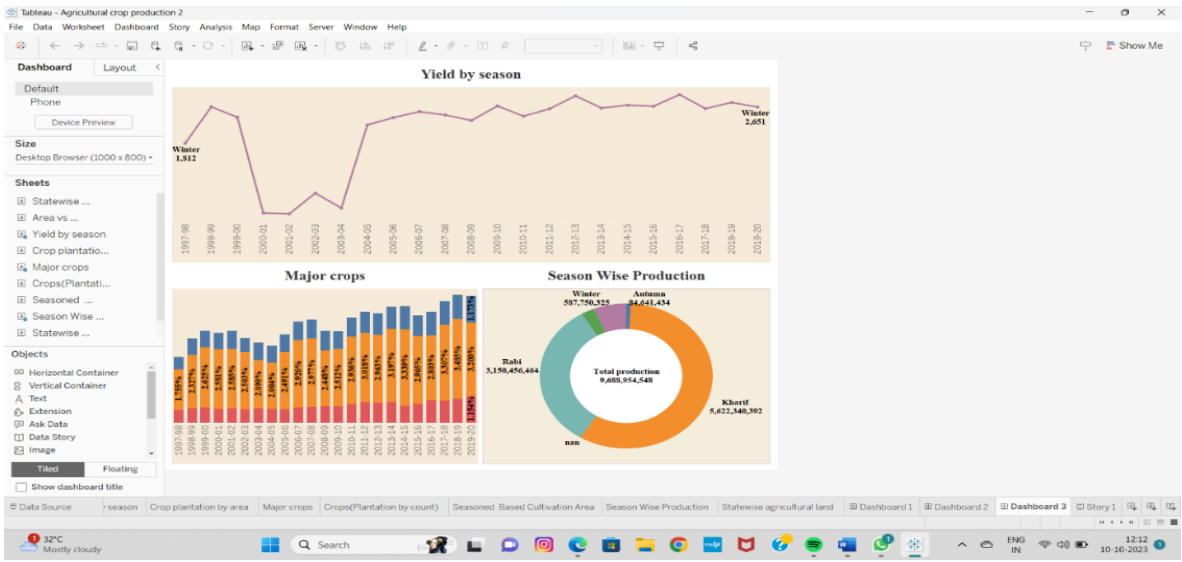
Dash Board 1



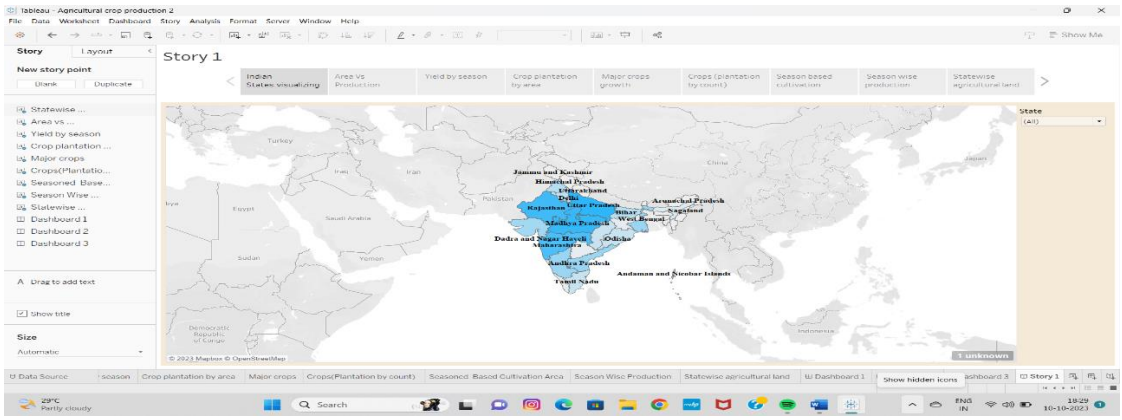
Dash Board 2

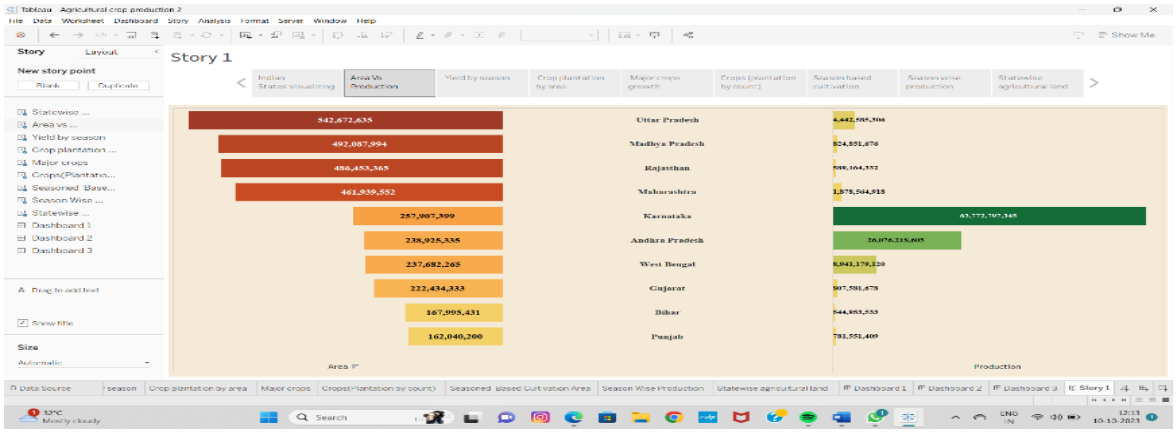


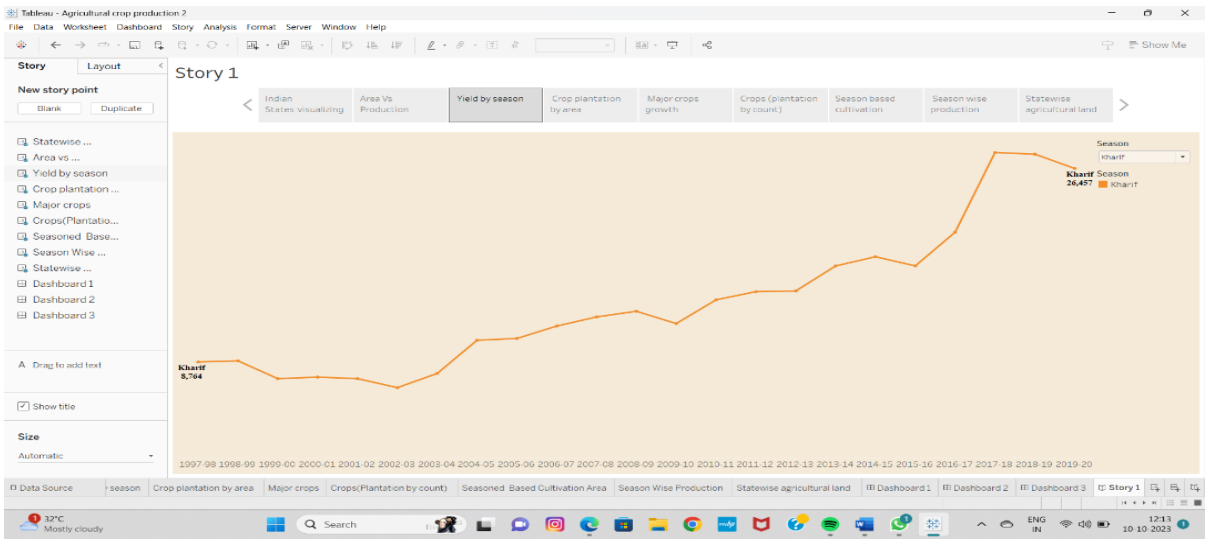
Dash Board 3



Story


Story 1
Jammu and Kashmir
Himachal Pradesh
Uttarakhand
Delhi
Rajasthan Uttar Pradesh
Bihar
West Bengal
Arunachal Pradesh
Nagaland
Madhya Pradesh
Dadra and Nagar Haveli
Maharashtra
Odisha
Andhra Pradesh
Tamil Nadu
Andaman and Nicobar Islands


Story 1
542,672,635
492,087,994
486,453,365
461,939,552
257,997,599
238,925,335
237,682,265
222,434,333
167,995,431
162,040,200
Uttar Pradesh
Madhya Pradesh
Rajasthan
Maharashtra
Karnataka
Andhra Pradesh
West Bengal
Gujarat
Bihar
Punjab
Area
Production


Story 1
Season
Kharif
Kharif Season
26,457
Kharif
8,704

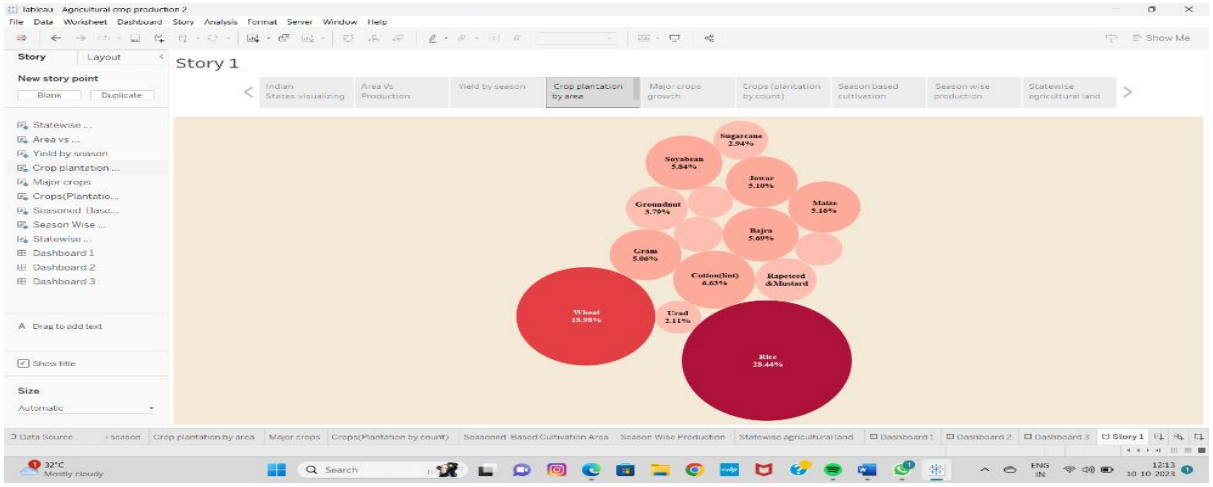


Tableau - Agricultural crop production 2
Story 1
Sugarcane 2.94%
Soyabean 5.84%
Jowar 3.10%
Groundnut 3.79%
Maize 5.16%
Bajra 5.60%
Gram 5.06%
Cotton(lint) 6.63%
Rapeseed &Mustard
Wheat 15.98%
Urad 2.11%
Rice 29.44%

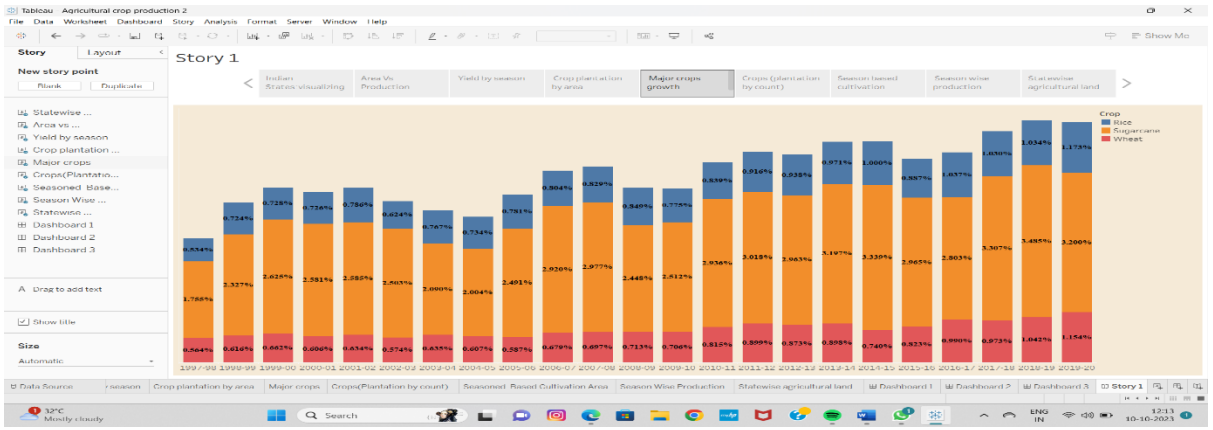


Tableau - Agricultural crop production 2
Story 1
Crop
Rice
Sugarcane
Wheat

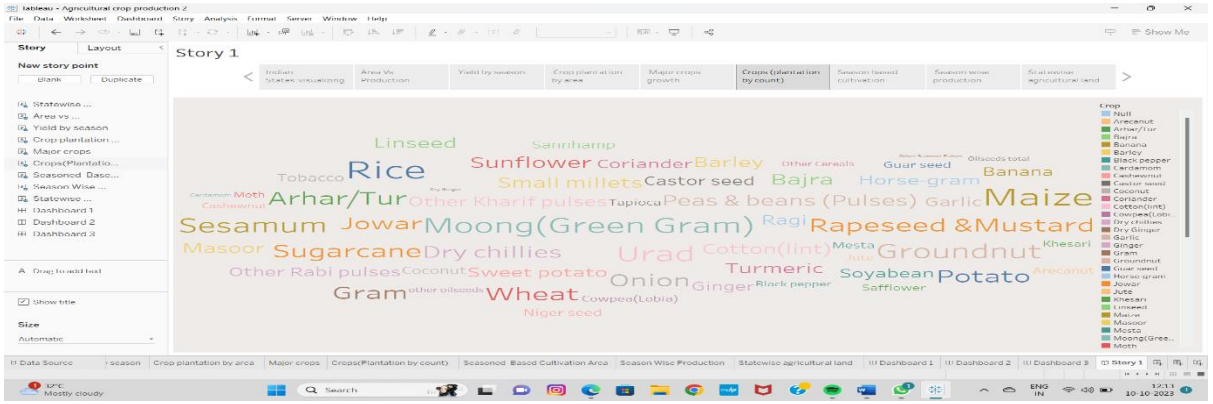


Tableau - Agricultural crop production 2
Story 1
Linseed
Sannhamp
Sunflower
Coriander
Barley
Tobacco
Rice
Small millets
Castor seed
Bajra
Horse-gram
Banana
Arhar/Tur
Other Kharif pulses
Tapioca
Peas & beans (Pulses)
Garlic
Maize
Sesamum
Jowar
Moong(Green Gram)
Ragi
Rapeseed &Mustard
Masoor
Sugarcane
Dry chillies
Urad
Cotton(lint)
Mesta
Groundnut
Khesari
Other Rabi pulses
Coconut
Sweet potato
Onion
Turmeric
Soyabean
Potato
Gram
Wheat
Cowpea(Lobia)
Ginger
Black pepper
Safflower
Niger seed

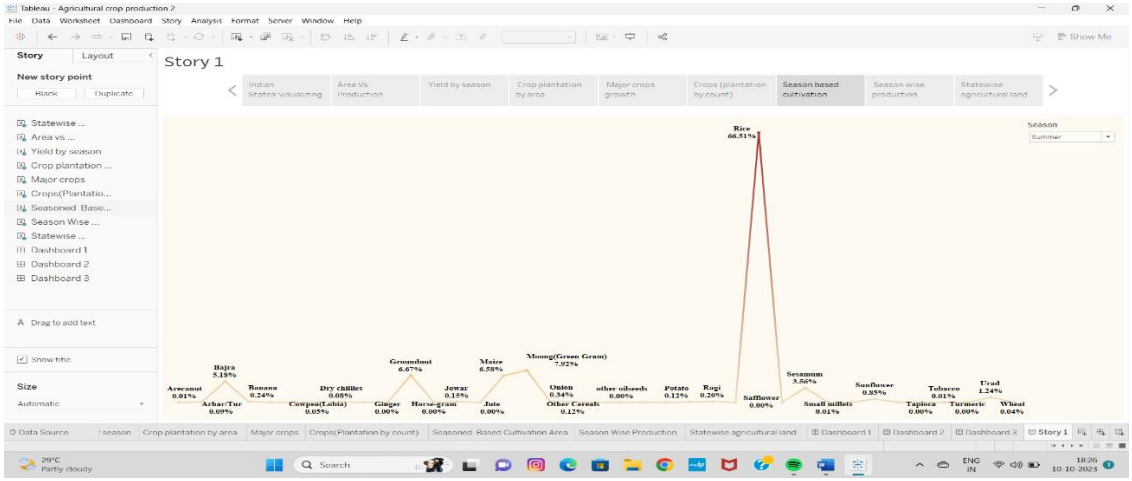


Tableau - Agricultural crop production 2
Story 1
Rice 66.51%
Season
Summer
Arecanut 0.01%
Bajra 5.18%
Arhar/Tur 0.09%
Banana 0.24%
Cowpea(Lobia) 0.05%
Dry chillies 0.08%
Ginger 0.00%
Groundnut 6.67%
Horse-gram 0.00%
Jowar 0.15%
Jute 0.00%
Maize 6.58%
Moong(Green Gram) 7.92%
Other Cereals 0.12%
Onion 0.34%
other oilseeds 0.00%
Potato 0.12%
Ragi 0.26%
Safflower 0.00%
Sesamum 3.56%
Small millets 0.01%
Sunflower 0.35%
Tapioca 0.00%
Tobacco 0.01%
Turmeric 0.00%
Urad 1.24%
Wheat 0.04%

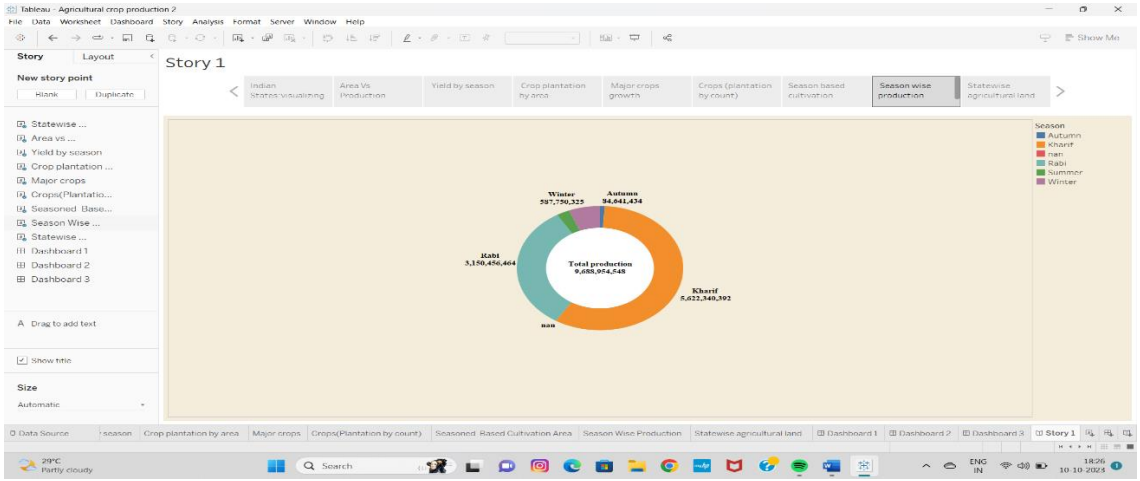


Tableau - Agricultural crop production 2
Story 1
Season wise production
Season
Autumn
Kharif
nan
Rabi
Summer
Winter
Winter 597,750,325
Autumn 34,641,434
Rabi 3,150,456,464
Total production 9,688,954,548
Kharif 5,622,340,392
nan

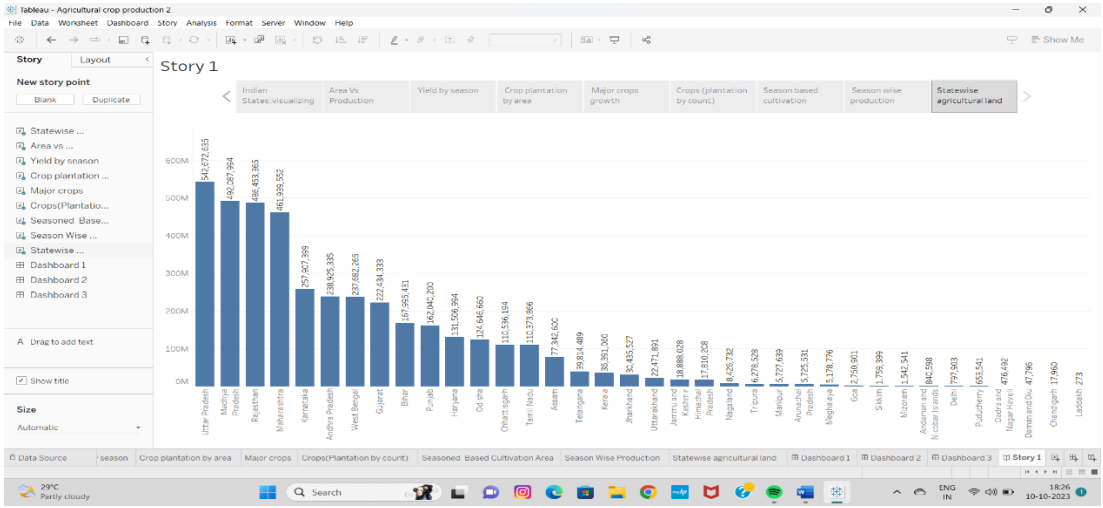


Tableau - Agricultural crop production 2
Story 1
Statewise agricultural land
600M
500M
400M
300M
200M
100M
0M
541,672,635
492,267,264
486,463,365
461,936,552
257,367,399
238,905,385
237,682,265
222,434,333
167,955,481
162,042,200
131,506,984
126,646,660
110,536,194
110,373,866
77,342,602
39,814,489
36,381,360
32,435,527
22,471,891
18,888,028
17,810,208
8,426,732
6,278,328
5,727,639
5,725,531
5,178,776
2,759,901
1,759,999
1,541,541
845,598
797,903
653,541
476,492
47,796
17,960
273
Uttar Pradesh
Madhya Pradesh
Rajasthan
Maharashtra
Karnataka
Andhra Pradesh
West Bengal
Gujarat
Bihar
Punjab
Haryana
Odisha
Chhattisgarh
Tamil Nadu
Assam
Telangana
Kerala
Jharkhand
Uttarakhand
Jammu and Kashmir
Himachal Pradesh
Nagaland
Tripura
Manipur
Arunachal Pradesh
Meghalaya
Goa
Sikkim
Mizoram
Andaman and Nicobar Islands
Delhi
Puducherry
Dadra and Nagar Haveli
Daman and Diu
Chandigarh
Ladakh

4.ADVANTAGES & DISADVANTAGES

Advantage:

India's agricultural crop production from 1997 to 2021 can provide valuable insights into the country's agricultural sector's growth and performance over this period. Here are some advantages of conducting such a project:

Policy Evaluation:

: Studying crop production data over two decades allows for an assessment of the effectiveness of various agricultural policies and initiatives introduced during this time frame. Researchers can evaluate which policies led to increased productivity and income for farmers.

Productivity Trends:

The project can help identify long-term trends in crop productivity, including the impact of advancements in agricultural technology, irrigation practices, and crop varieties on yields diversification trends. It can provide insights into how farmers adapt to changing market demands and climate conditions..

Crop Yields and Food Security:

Understanding the variations in crop yields over time can help in assessing food security issues in India. It can shed light on whether the country is producing enough food to meet the needs of its growing population.

Economic Impact:

Analyzing crop production can provide insights into the economic impact of the agricultural sector on India's overall economy. It can help gauge the contribution of agriculture to the country's GDP.

Regional Disparities:

Examining crop production data at the regional level can highlight disparities in agricultural development across different states. This information can be used to target interventions in regions that are lagging behind.

Sustainability Assessment:

The project can evaluate the sustainability of agricultural practices used in India. It can assess the impact on soil health, water resources, and overall environmental sustainability.

Future Planning:

Insights from the analysis can inform future agricultural policies and strategies. Decision-makers can use the data to make informed choices regarding investments in infrastructure, research, and development.

Disadvantage:

While conducting an analysis of India's agricultural crop production from 1997 to 2021 offers numerous advantages, there are also some disadvantages and challenges associated with such a project:

Data Quality and Availability:

Agricultural data, especially in developing countries like India, may suffer from inconsistencies, inaccuracies, or incomplete records. This can make it challenging to perform a comprehensive analysis.

Data Lag:

Agricultural data is often not available in real-time, and there can be significant delays in data collection and reporting. This lag can limit the ability to make timely policy recommendations.

Data Discrepancies:

Different sources of agricultural data may provide conflicting information. Harmonizing and reconciling these discrepancies can be a time-consuming and complex process.

Changing Definitions and Classifications:

Over the years, definitions and classifications of crops and agricultural practices may change, making it difficult to compare data across different time periods.

Regional Variation:

India is a vast and diverse country with significant regional variations in climate, soil types, and farming practices. This diversity can make it challenging to generalize findings and recommendations for the entire country.

Causality vs. Correlation:

Establishing causality between specific policies or practices and crop production trends can be difficult. Correlations may exist, but demonstrating direct causality can be complex.

External Factors:

Crop production is influenced by various external factors such as global commodity prices, international trade policies, and geopolitical events. These factors can complicate the analysis of India's agricultural production in isolation.

5.APPLICATIONS

India's agricultural crop production has a wide range of applications across various sectors. Here are some key areas where this analysis can be applied:

Environmental Conservation:

Understanding the impact of agriculture on the environment, such as deforestation and water usage, helps in formulating policies for sustainable agricultural practices.

Investment and Finance:

Investors and financial institutions can use this data to assess the creditworthiness of farmers and agricultural businesses, as well as to make investment decisions in the agricultural sector.

Technology Adoption:

crop production can help in assessing the adoption of modern agricultural technologies, such as precision farming and mechanization.

Export Opportunities:

Identifying surplus production areas can inform export strategies and boost the country's agricultural exports.

Disaster Preparedness:

Governments can use crop production data to prepare for natural disasters and food emergencies, ensuring timely relief and aid distribution.

Research and Education:

Universities and agricultural institutions can use this data for research, education, and training programs to equip future generations with the knowledge and skills needed for the agricultural sector

6.CONCLUSION

In conclusion, the analysis of India's agricultural crop production from 1997 to 2021 reveals a multifaceted story of growth, challenges, and resilience. Over these decades, India has witnessed significant advancements in agricultural practices and technologies, leading to an overall increase in crop production. However, this growth has not been without its obstacles, including unpredictable weather patterns, soil degradation, and the need for sustainable farming practices. Additionally, the socio-economic dynamics of agriculture in India have evolved, with a growing focus on diversification, market integration, and improving the livelihoods of farmers. As we move forward, it is evident that India's agricultural sector must continue to adapt to emerging challenges, such as climate change and the need for more equitable distribution of resources and benefits. With innovative solutions and policies, India can further bolster its agricultural production while ensuring the well-being of its farming communities and the sustainability of its food systems.

7.FUTURE SCOPE

The future scope for India's agricultural crop production, based on an analysis of the period from 1997 to 2021, is both promising and challenging. Over this period, India has made significant strides in increasing its agricultural output, becoming one of the world's largest producers of several key crops, such as rice, wheat, and cotton. This growth has been driven by factors such as technological advancements, improved irrigation infrastructure, and government policies promoting agriculture.

Looking ahead, India's agricultural sector can continue to thrive by capitalizing on several opportunities. First, there is a growing demand for organic and sustainable agriculture, presenting a chance for India to diversify its crop production and cater to international markets that value environmentally friendly farming practices. Second, the adoption of precision agriculture, coupled with advancements in data analytics and AI, can enhance crop yields and reduce resource wastage.

However, challenges loom on the horizon. Climate change poses a significant threat, leading to more unpredictable weather patterns and increased vulnerability to extreme events. Adapting to these changes will require innovative techniques, drought-resistant crop varieties, and better water management practices. Additionally, India must address issues related to land degradation and soil health to ensure the long-term sustainability of crop production.

To fully realize the future potential of India's agricultural crop production, it is essential to invest in research and development, provide better access to credit and technology for small-scale farmers, and promote agribusiness and food processing industries. This will not only improve food security but also drive economic growth in rural areas, contributing to the overall development of the country.

Project links

Project Github Link:

https://github.com/yamuyamini/Indians-agricultural-NM2023TMID05723

Tableau Public Dashboard Link:

https://public.tableau.com/views/Agriculturalcropproduction_16969101374320/Dashboard1?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

https://public.tableau.com/views/Agriculturalcropproductiondashboard2/Dashboard2?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

https://public.tableau.com/views/Agriculturalcropproductiondashboard3/Dashboard3?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

Tableau Public Story Link:

https://public.tableau.com/views/AgriculturalcropproductionStory/Story1?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link