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

A PROJECT REPORT

Submitted by

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in partial fulfilment for the award of the degree of

BACHELOR OF SCIENCE

IN

PHYSICS

DEPARTMENT OF PHYSICS

SRI KUMARA GURUPARA SWAMIGAL ARTS COLLEGE

Srivaikuntam – 628 619, Tamil Nadu

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October - 2023

ACKNOWLEDGEMENT

First of all, I express my profound gratitude to the God Almighty for the successful completion of the project work.

We have great pleasure in expressing our heartfelt thanks with gratitude to my guide **Mr.SUDDALAI KANNAN,** Assistant Professor of Physics, Sri K.G.S. Arts college, Srivaikuntam, for her academic guidelines, support and constant encouragement for the successful completion of this project work.

We express our sincere to our **Secretary Dr. S. Sankaranarayanan**, for taking enormous care for the completion of this project report in a successful manner.

We extremely thanks to our **Principal Dr. N. Vijayakumar**, for the encouragement and help rendered towards the completion of this project work.

We express heartfelt thanks to our college **SPOC Dr. C.Geetha** for the completion of this project report in a successful manner.

We extremely thank to our **Naan mudhalvan Industry Mentors Mr.Vijay Vajravel, Mr. Hemant Kumar and Mr.Hari**, for the encouragement and help rendered towards the completion of this project report in a successful manner.

We express our heartfelt thanks to all the department staff members and lab assistants for their co-operation for this project work.

We express our whole hearted indebtedness to our beloved parents, family members and friends for their immense help to execute the project work successfully.

CONTENT

1. INTRODUCTION:

India's agricultural sector has long been the backbone of the nation's economy, providing sustenance and livelihoods to millions. Analyzing India's agricultural crop production is essential in understanding the nation's food security, economic stability, and environmental sustainability. In this analysis, we will delve into the diverse range of crops cultivated across the country, the factors influencing production, and the implications for both the domestic and global markets. This exploration aims to shed light on the intricacies of India's agricultural landscape, from traditional practices to modern innovations, and the challenges and opportunities it presents in the 21st century.

1.1 OVERVIEW:

An overview of India's agricultural crop production analysis reveals a complex and multifaceted landscape. India's agriculture is not only a vital contributor to its economy but also a reflection of its diverse culture and geography. Here are some key aspects to consider in analyzing India's agricultural crop production:

1. **Crop Diversity**: India is renowned for its diverse range of crops, including rice, wheat, pulses, cotton, sugarcane, oilseeds, fruits, and vegetables. This diversity is a result of the country's varied climate zones, soil types, and cultural practices.

2. **Cereal Dominance**: Cereal crops, particularly rice and wheat, are the primary staples in the Indian diet. These crops receive significant attention from both the government and farmers due to their central role in food security.

3. **Monsoon Dependency**: India's agriculture is highly dependent on the monsoon season, which brings the majority of its annual rainfall. Variations in the monsoon can have a profound impact on crop yields, making the sector vulnerable to climate change.

4. **Smallholder Farming**: A significant proportion of India's farmers are smallholders, with limited access to resources, modern technology, and credit. Their productivity and income levels are crucial considerations in any analysis.

5. **Technology and Innovation**: In recent years, there has been a growing emphasis on technology and innovation in agriculture, including the use of genetically modified crops, precision agriculture, and mechanization to increase productivity and efficiency.

6. **Government Policies**: Government policies play a crucial role in shaping crop production in India. Subsidies, support prices, and agricultural schemes influence farmers' decisions and overall crop output.

7. **Challenges**: India faces several challenges in crop production, including water scarcity, soil degradation, pests and diseases, post-harvest losses, and the need for sustainable farming practices.

8. **Exports and Imports**: India is not only a significant producer but also an importer and exporter of various agricultural commodities. Understanding its role in the global agricultural market is vital.

9. **Environmental Impact**: The environmental impact of agricultural practices, such as water usage and pesticide application, is a critical concern. Sustainable and environmentally friendly farming practices are gaining attention.

10. **Market Dynamics**: Crop production analysis in India also encompasses market dynamics, including price fluctuations, supply and demand, and the influence of international markets.

1.2. PURPOSE:

The analysis of India's agricultural crop production serves several important purposes, which are critical for the country's economy, food security, and overall well-being. Some of the key purposes of such analysis include:

1. **Food Security**: India's population is massive, and ensuring a steady and sufficient supply of food is paramount. Crop production analysis helps monitor the availability of essential food crops like rice, wheat, and pulses, which are staples in the Indian diet. It aids in identifying potential shortfalls and planning to mitigate food shortages.

2. **Economic Planning**: Agriculture is a significant contributor to India's GDP and employment. Analyzing crop production helps the government and

policymakers make informed decisions regarding budget allocation, subsidies, and other agricultural policies that can drive economic growth and rural development.

3. **Resource Allocation**: Understanding which crops are grown where and in what quantities is crucial for resource allocation. This includes water resources, land use, agricultural inputs, and infrastructure development for transportation and storage.

4. **Climate Resilience**: Climate change has a substantial impact on agriculture. Analysis of crop production can help identify how changing weather patterns are affecting different crops and regions. This information is valuable for developing climate-resilient farming practices.

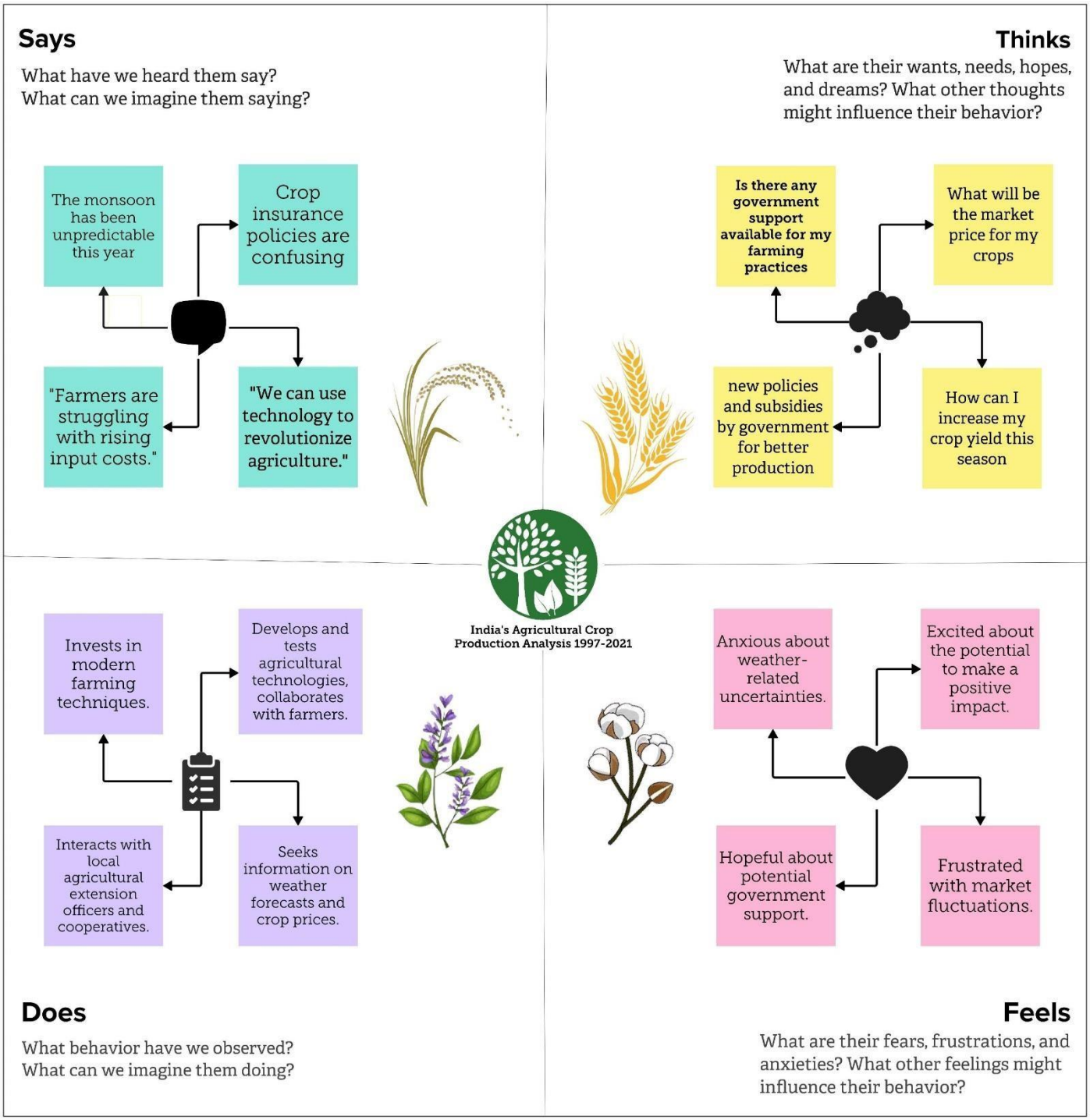
5. **Technology Adoption**: Crop production analysis can reveal how technology and innovation are being adopted in agriculture. It helps assess the effectiveness of modern farming practices, like mechanization, genetically modified crops, and precision agriculture.

6. **Market Dynamics**: Understanding the production levels of various crops is essential for managing domestic and international markets. It assists in stabilizing prices, managing exports and imports, and ensuring farmers receive fair prices for their produce.

2. PROBLEM DEFINITION & DESIGN THINKING:

2.1 EMPATHY MAP:

An empathy map is a collaborative visualization used to articulate what we know about a particular type of user.



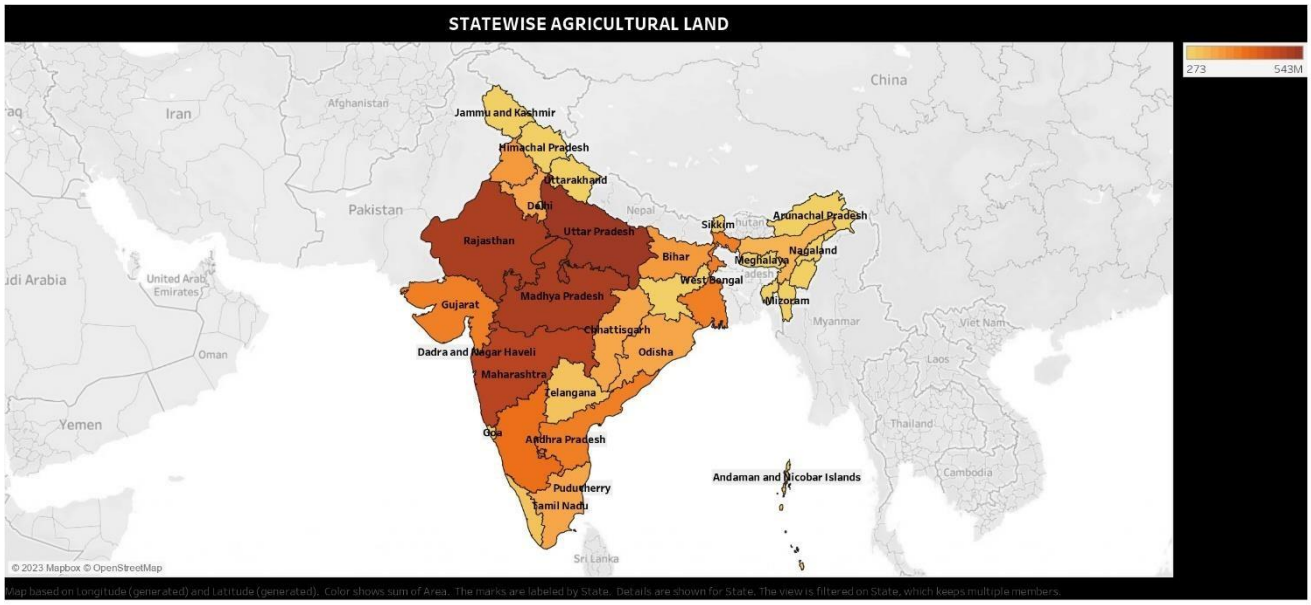
2.2 IDEATION & BRAINSTORMING MAP:

Brainstorming is a group problem sloving method that involves the spontaneous contribution of creative ideas and solutions.


Define your problem statement
What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.
5 minutes
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.
Brainstorm
Write down any ideas that come to mind that address your problem statement.
10 minutes
Person 1
Person 2
Person 3
Person 4
Person 5
Group ideas
Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.
20 minutes
Analyze historical data on crop yields in India over the past few decades. Identify trends, factors influencing changes in yields, and regional variations. Discuss the impact of technological advancements and policy changes on crop production
Study the impact of climate change on India's crop production. Analyze data on temperature, rainfall, and crop yields to identify correlations and assess the vulnerability of different crops to climate variability
Explore the effectiveness of crop insurance schemes in India. Analyze data related to insurance claims, farmer participation, and payout distribution. Discuss the role of insurance in mitigating agricultural risks
Prioritize
Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.
20 minutes
Examine the diversity of crops grown across different states and regions in India
Analyze the post-harvest losses and storage facilities for crops in India
Explore the benefits and challenges of crop rotation in different regions.
Compare India's crop production and agricultural practices with other countries to identify best practices and areas for improvement
Analyze the adoption of modern agricultural practices and technologies to address these challenges
Analyze trade policies and their impact on crop production and trade balances
Analyze the prevalence of crop diseases and pests and their impact on crop production
Study price fluctuations for major crops to understand market dynamics
Study soil quality and nutrient levels in various regions to understand their influence on crop production
Study the role of organic farming and its potential benefits
Importance
Feasibility

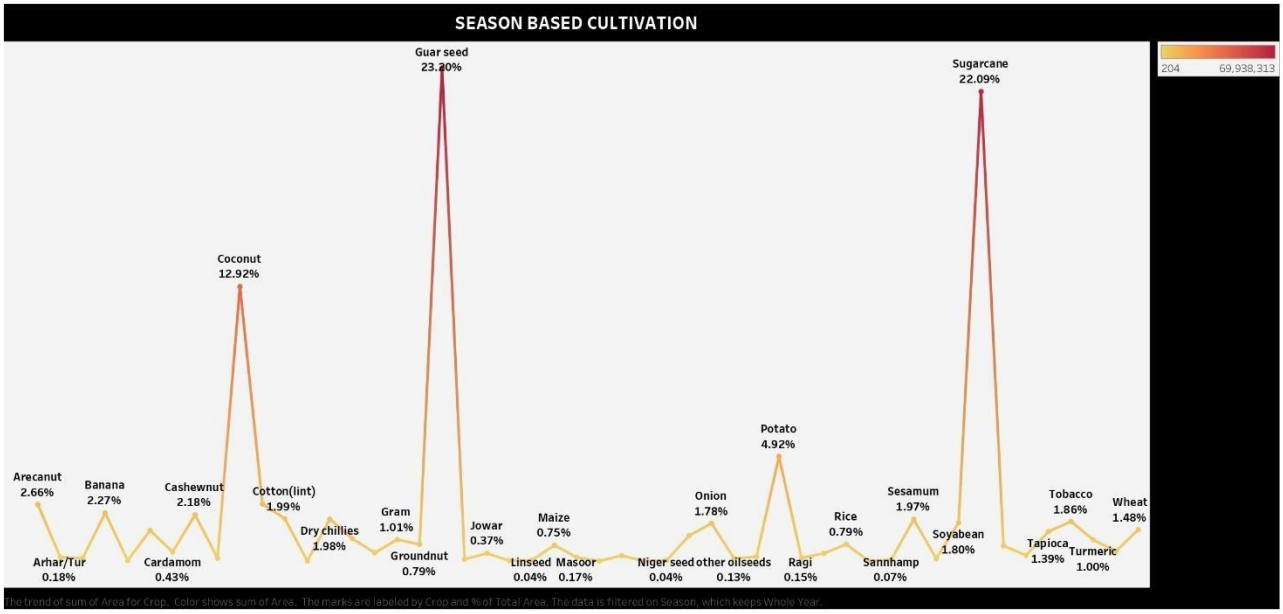
3. RESULT:

STATEWISE AGRICULTURAL LAND

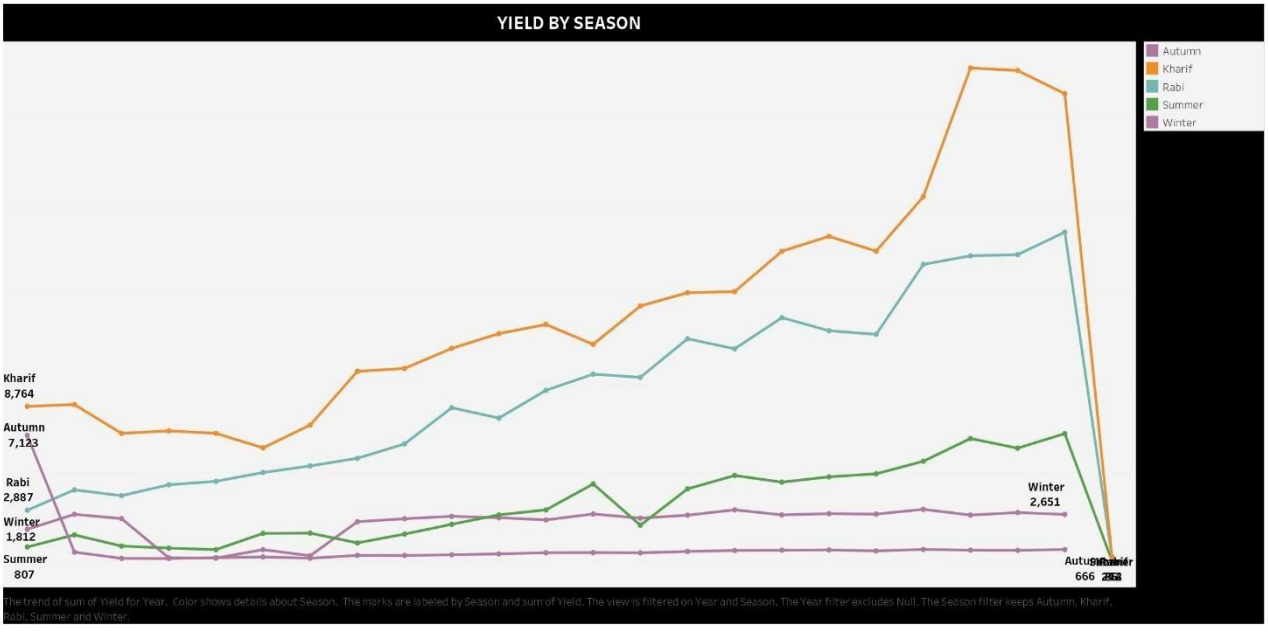


AREA VS PRODUCTION

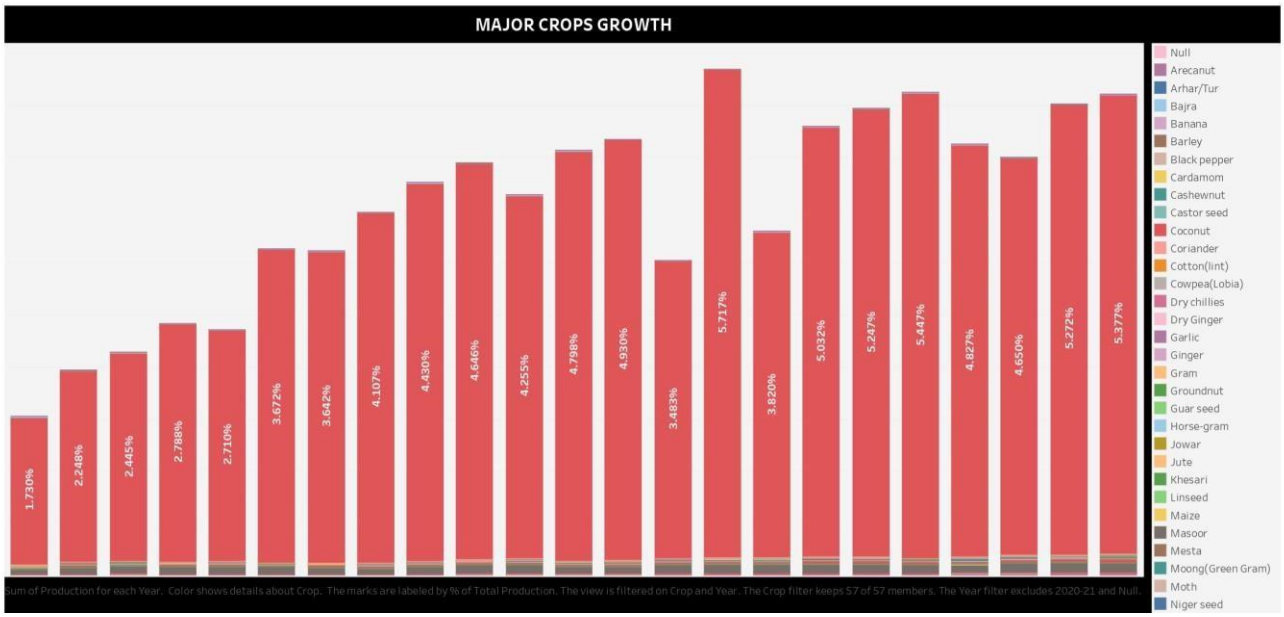
SEASON BASED CULTIVATION



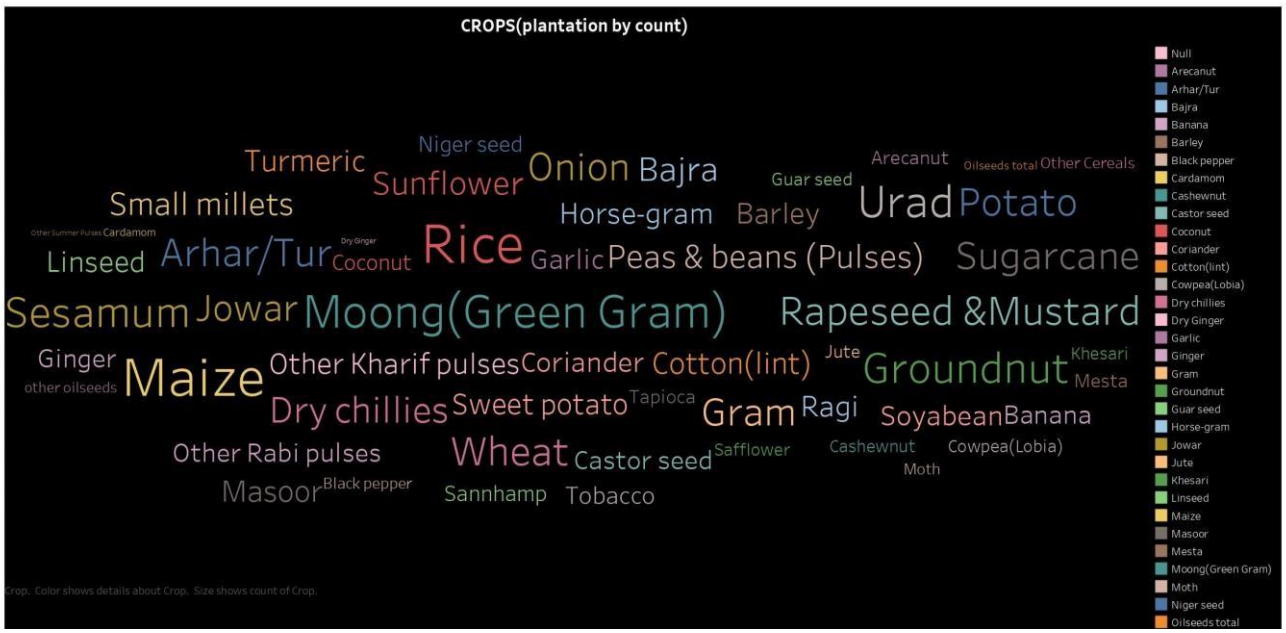
YIELD BY SEASON



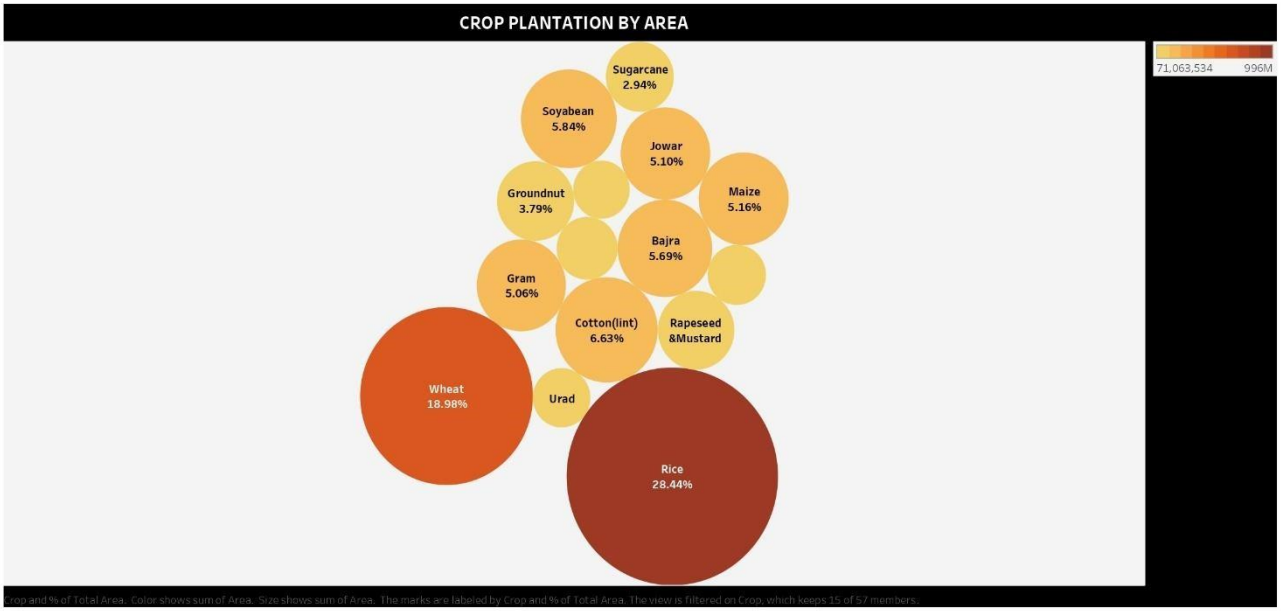
MAJOR CROPS GROWTH



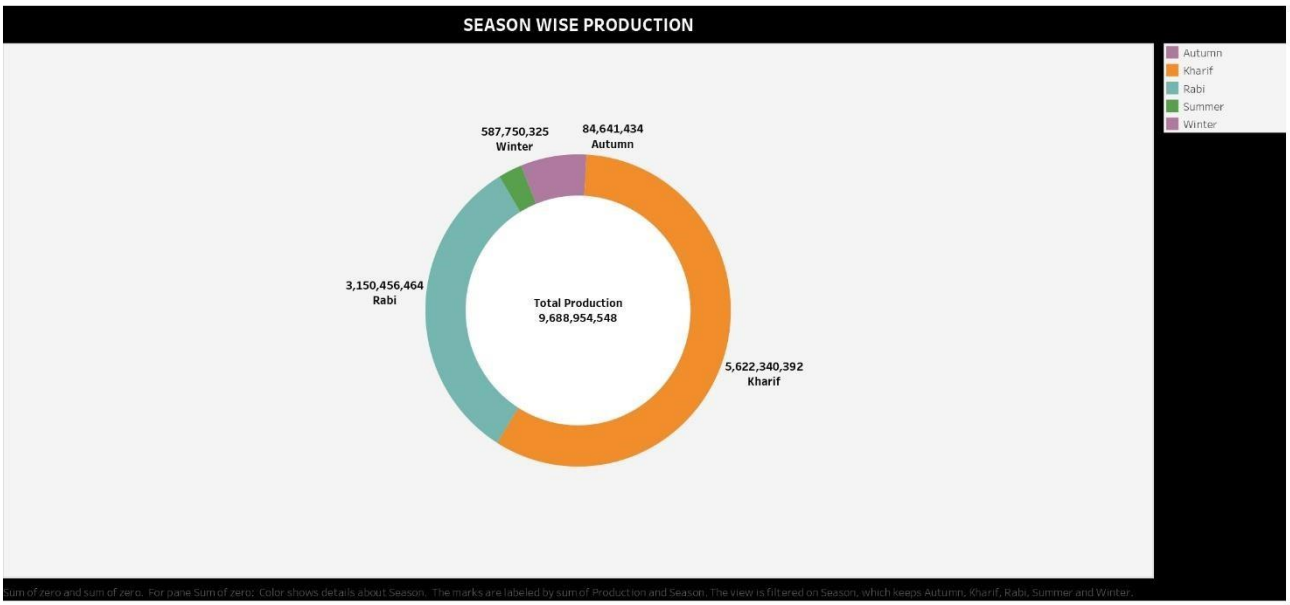
CROPS(plantation by count)



CROPS PLANTATION BY AREA

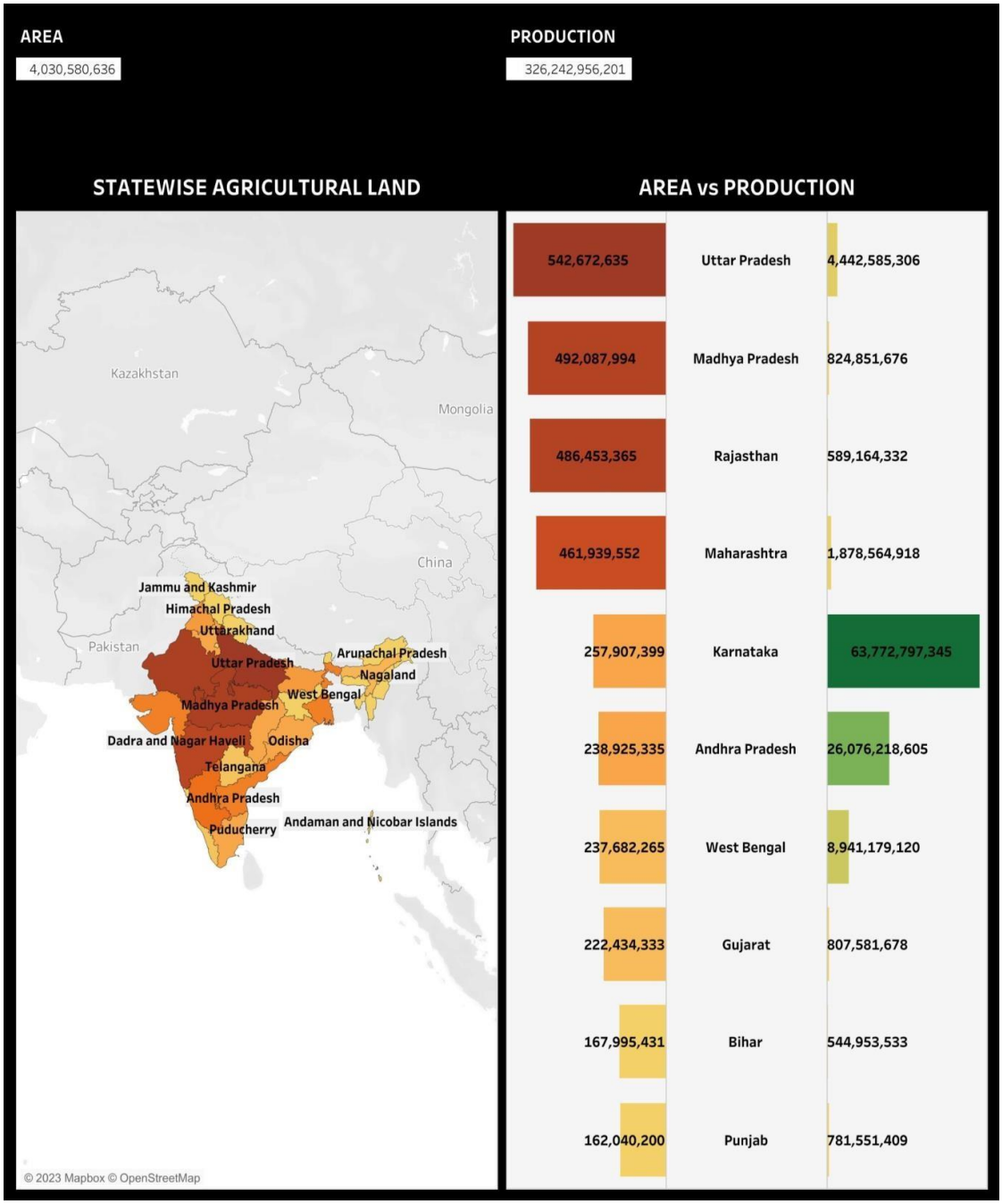


SEASON WISE PRODUCTION

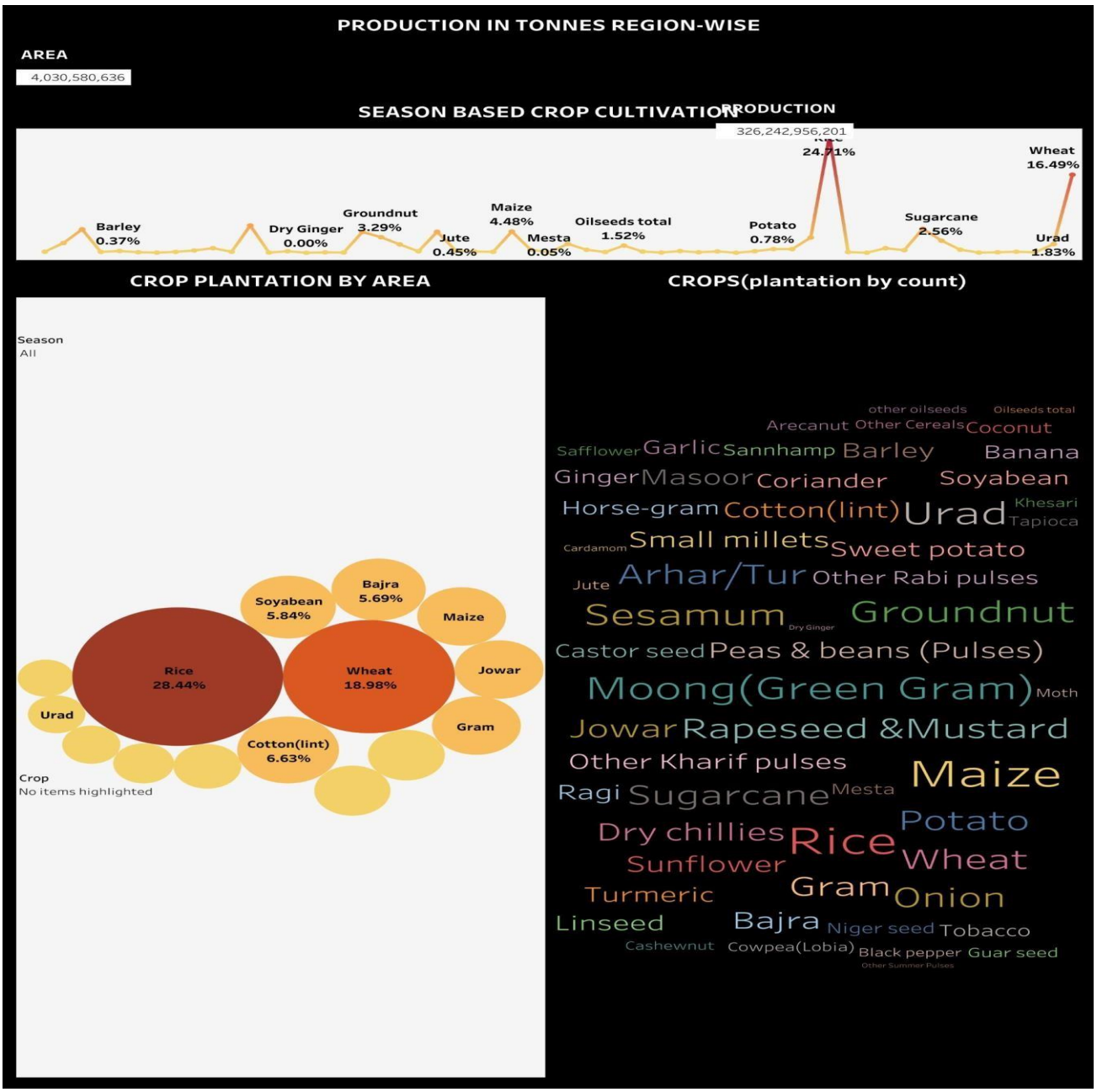


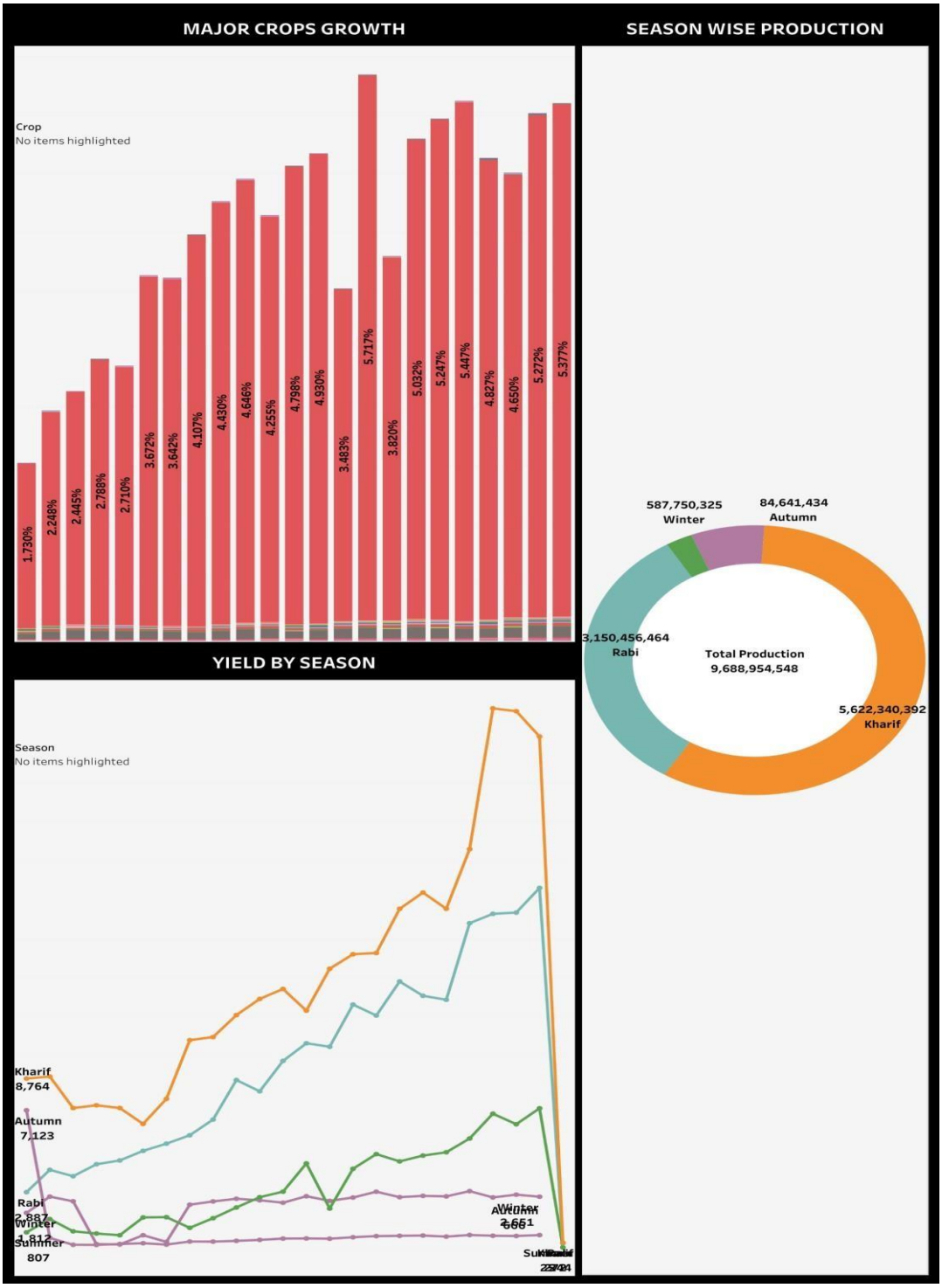
DASHBOARD: A Data dashboard is a tool many businesses use to track, analyse, and display data.

Dashboard 1


AREA
4,030,580,636
PRODUCTION
326,242,956,201
STATEWISE AGRICULTURAL LAND
AREA vs PRODUCTION
Kazakhstan
Mongolia
China
Pakistan
Jammu and Kashmir
Himachal Pradesh
Uttarakhand
Uttar Pradesh
Arunachal Pradesh
Nagaland
West Bengal
Madhya Pradesh
Dadra and Nagar Haveli
Odisha
Telangana
Andhra Pradesh
Puducherry
Andaman and Nicobar Islands
© 2023 Mapbox © OpenStreetMap
542,672,635 Uttar Pradesh 4,442,585,306
492,087,994 Madhya Pradesh 824,851,676
486,453,365 Rajasthan 589,164,332
461,939,552 Maharashtra 1,878,564,918
257,907,399 Karnataka 63,772,797,345
238,925,335 Andhra Pradesh 26,076,218,605
237,682,265 West Bengal 8,941,179,120
222,434,333 Gujarat 807,581,678
167,995,431 Bihar 544,953,533
162,040,200 Punjab 781,551,409

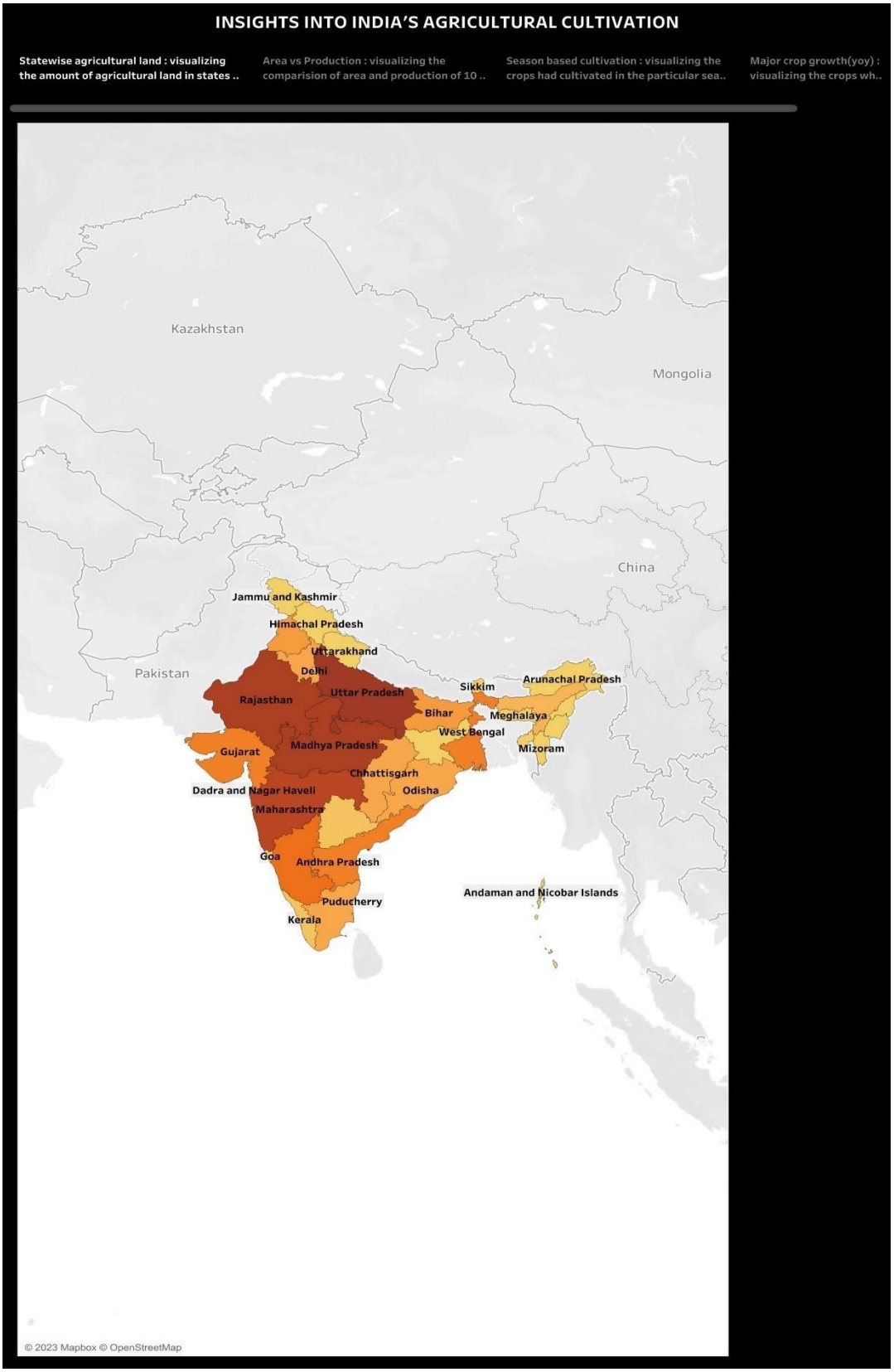
DASHBOARD 2


PRODUCTION IN TONNES REGION-WISE
AREA
4,030,580,636
SEASON BASED CROP CULTIVATION
PRODUCTION
326,242,956,201
Barley 0.37%
Dry Ginger 0.00%
Groundnut 3.29%
Jute 0.45%
Maize 4.48%
Mesta 0.05%
Oilseeds total 1.52%
Potato 0.78%
24.71%
Sugarcane 2.56%
Wheat 16.49%
Urad 1.83%
CROP PLANTATION BY AREA
Season
All
Soyabean 5.84%
Bajra 5.69%
Maize
Rice 28.44%
Wheat 18.98%
Jowar
Urad
Gram
Cotton(lint) 6.63%
Crop
No items highlighted
CROPS(plantation by count)
other oilseeds
Oilseeds total
Arecanut
Other Cereals
Coconut
Safflower
Garlic
Sannhamp
Barley
Banana
Ginger
Masoor
Coriander
Soyabean
Horse-gram
Cotton(lint)
Urad
Khesari
Tapioca
Cardamom
Small millets
Sweet potato
Jute
Arhar/Tur
Other Rabi pulses
Sesamum
Dry Ginger
Groundnut
Castor seed
Peas & beans (Pulses)
Moong(Green Gram)
Moth
Jowar
Rapeseed &Mustard
Other Kharif pulses
Maize
Ragi
Sugarcane
Mesta
Potato
Dry chillies
Rice
Wheat
Sunflower
Turmeric
Gram
Onion
Linseed
Bajra
Niger seed
Tobacco
Cashewnut
Cowpea(Lobia)
Black pepper
Guar seed
Other Summer Pulses



Dashboard 3

STORY: A story is a sequence of visualizations that work together to convey information.


INSIGHTS INTO INDIA'S AGRICULTURAL CULTIVATION
Statewise agricultural land : visualizing the amount of agricultural land in states ..
Area vs Production : visualizing the comparision of area and production of 10 ..
Season based cultivation : visualizing the crops had cultivated in the particular sea..
Major crop growth(yoy) : visualizing the crops wh..
Kazakhstan
Mongolia
China
Pakistan
Jammu and Kashmir
Himachal Pradesh
Uttarakhand
Delhi
Rajasthan
Uttar Pradesh
Bihar
Sikkim
Arunachal Pradesh
Meghalaya
West Bengal
Mizoram
Gujarat
Madhya Pradesh
Chhattisgarh
Odisha
Dadra and Nagar Haveli
Maharashtra
Goa
Andhra Pradesh
Puducherry
Kerala
Andaman and Nicobar Islands
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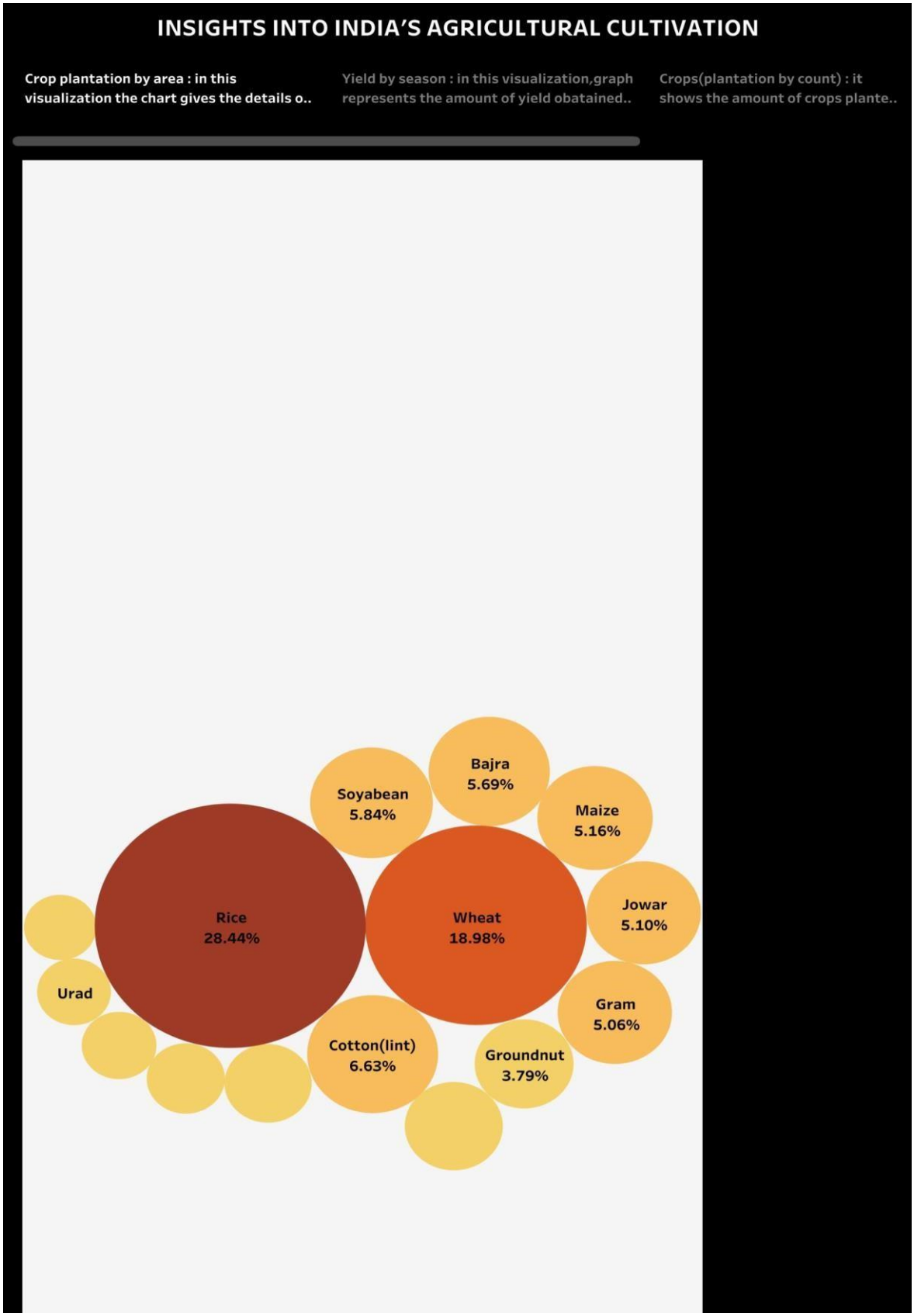
Story 1


INSIGHTS INTO INDIA'S AGRICULTURAL CULTIVATION
Crop plantation by area : in this visualization the chart gives the details o..
Yield by season : in this visualization,graph represents the amount of yield obatained..
Crops(plantation by count) : it shows the amount of crops plante..
Bajra 5.69%
Soyabean 5.84%
Maize 5.16%
Rice 28.44%
Wheat 18.98%
Jowar 5.10%
Urad
Gram 5.06%
Cotton(lint) 6.63%
Groundnut 3.79%

Story 2

Advantages:

1. Food Security: India's large agricultural sector ensures food security for its vast population. Crop production analysis helps in understanding food availability and planning for potential shortages.

2. Livelihoods: Agriculture is a primary source of livelihood for a significant portion of the Indian population. Crop production analysis can aid in income generation and rural development.

3. Economic Growth: Agriculture contributes to India's GDP and exports. A thorough analysis can identify growth opportunities and areas for improvement.

4. Climate Resilience: Studying crop production helps adapt to climate change by identifying climate-resilient crops and sustainable agricultural practices.

5. Technology Adoption: Crop analysis encourages the adoption of modern farming techniques, seeds, and technologies for increased yield and efficiency.

6. Policy Formulation: Data from crop production analysis informs government policies related to subsidies, crop insurance, and other agricultural schemes

7. Trade Balance: Excess production can lead to exports, contributing positively to the trade balance.

Disadvantages:

1. Data Quality: Data collection in Indian agriculture can be inconsistent and not always reliable. This can hinder accurate analysis.

2. Monoculture: Focusing on high-yield crops might lead to monoculture, which can harm biodiversity and soil health.

3. Land Degradation: Excessive cultivation, inefficient irrigation, and improper land management can lead to soil degradation.

4. Pesticide and Fertilizer Overuse: To maximize yield, farmers may use excessive pesticides and fertilizers, which can harm the environment and health.

5. Vulnerability to Climate Change: India's heavy reliance on the monsoon season makes agriculture vulnerable to climate fluctuations.

6. Income Disparity: Small and marginalized farmers may not benefit equally from crop production analysis, leading to income disparities.

7. Export Risks: Depending on crop exports for revenue can make India's agricultural sector sensitive to global market fluctuations.

5.APPLICATIONS:

India's agricultural crop production analysis has several important applications that contribute to the development, sustainability, and overall well-being of the country. These applications include:

1. **Food Security**: Crop production analysis helps ensure a consistent and adequate food supply for India's vast population. It enables the government to plan for food distribution, manage food stocks, and respond to potential shortages or surpluses.

2. **Agricultural Policy**: Crop production data informs government policies related to subsidies, price support, crop insurance, and other agricultural schemes. It aids in the formulation of policies that promote sustainable agriculture and rural development.

3. **Crop Selection**: Farmers and policymakers use crop production analysis to make informed decisions about the types of crops to cultivate. This helps in diversifying agricultural production and promoting climateresilient crops.

4. **Resource Allocation**: By analyzing crop production, resources such as land, water, and fertilizers can be optimally allocated to maximize yield and minimize waste.

5. **Research and Development**: Data on crop production guides agricultural research by identifying areas where improvements are needed. This includes developing new crop varieties, improving pest and disease management, and enhancing agricultural practices.

6. **Market Planning**: Crop production analysis is essential for market planning and price forecasting. It helps farmers make informed decisions about when and where to sell their produce to obtain the best prices.

7. **Climate Resilience**: Understanding historical crop data and trends can assist in developing climate-resilient agricultural practices. This is vital in a changing climate scenario with more frequent extreme weather events.

8. **Trade and Exports**: Crop production analysis helps identify opportunities for exporting surplus crops, contributing to the country's economy and trade balance. It also aids in complying with international quality and safety standards for exports.

9. **Sustainability**: Monitoring crop production can help prevent overexploitation of natural resources, mitigate land degradation, and promote sustainable farming practices.

10. **Income Generation**: For individual farmers, crop production analysis can enhance income by optimizing crop selection, techniques, and access to markets. It empowers them to make data-driven decisions

6. CONCLUSION:

1. **Diverse Crop Portfolio**: India has a diverse range of crops due to its varied climate and geography. The country produces a wide variety of food crops, including rice, wheat, pulses, sugarcane, cotton, and oilseeds. This diversity is essential for food security and economic stability.

2. **Rice and Wheat Dominance**: Rice and wheat have historically been the dominant staple crops in India. These two crops play a significant role in ensuring food security and addressing hunger issues.

3. **Crop Yield Improvement**: India has made significant strides in improving crop yields through the Green Revolution and continued investments in agricultural research, technology, and infrastructure. Highyielding crop varieties and modern agricultural practices have contributed to increased production.

4. **Challenges in Agricultural Productivity**: Despite improvements, India still faces challenges in achieving consistent high agricultural productivity. Issues such as fragmented landholdings, water scarcity, soil degradation, and weather-related risks impact crop yields.

5. **Government Initiatives**: The Indian government has implemented various initiatives to support agriculture, such as the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), Pradhan Mantri Fasal Bima Yojana (PMFBY), and Krishi Sinchayee Yojana (PMKSY). These programs aim to provide financial support to farmers, mitigate risks, and improve irrigation infrastructure.

6. **Market and Export Trends**: India has become a significant exporter of agricultural products, including rice, sugar, and spices. International trade in agricultural goods plays a crucial role in the country's economy.

7. **Sustainability and Environmental Concerns**: India faces challenges related to sustainable agriculture, including excessive use of chemical fertilizers, overuse of water resources, and environmental degradation. Balancing increased production with environmental sustainability is a critical concern.

7.FUTURE SCOPE:

The future of India's agricultural crop production depends on several factors, including climate change, technology adoption, policy reforms, and investments in infrastructure. Sustainable practices, efficient resource management, and innovative farming techniques will be essential for meeting the food demands of a growing population.

8.APPENDIX

SOURCE CODE

DASHBOARD 1

https://public.tableau.com/views/DASHBOARD1_16964978951220/Dashboard1?:language=en-GB&:display_count=n&:origin=viz_share_link

DASHBOARD 2

https://public.tableau.com/shared/8F5QJN72Z?:display_count=n&:origin=viz_share_link

DASHBOARD 3

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STORY 1

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STORY 2

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