India’s Agricultural Crop Production Analysis(1997-2021)

1.Introduction:-

- The agricultural crop production in India from 1997 to 2021 has witnessed significant changes and developments, reflecting the nation's dynamic agricultural landscape. This period has been marked by fluctuations in crop yields, adoption of modern farming techniques, and the impact of various factors such as climate change, government policies, and technological advancements, all of which have played a pivotal role in shaping the country's agricultural output. In this analysis, we will delve into the key trends, challenges, and achievements that have defined India's agricultural sector during this period, providing a comprehensive overview of the country's crop production dynamics.

1.1.OVERVIEW

- The agricultural landscape of India between 1997 and 2021 has seen significant changes and developments. This period has witnessed fluctuations in crop yields, the adoption of modern farming techniques, and the influence of various factors such as climate change, government policies, and technological advancements.

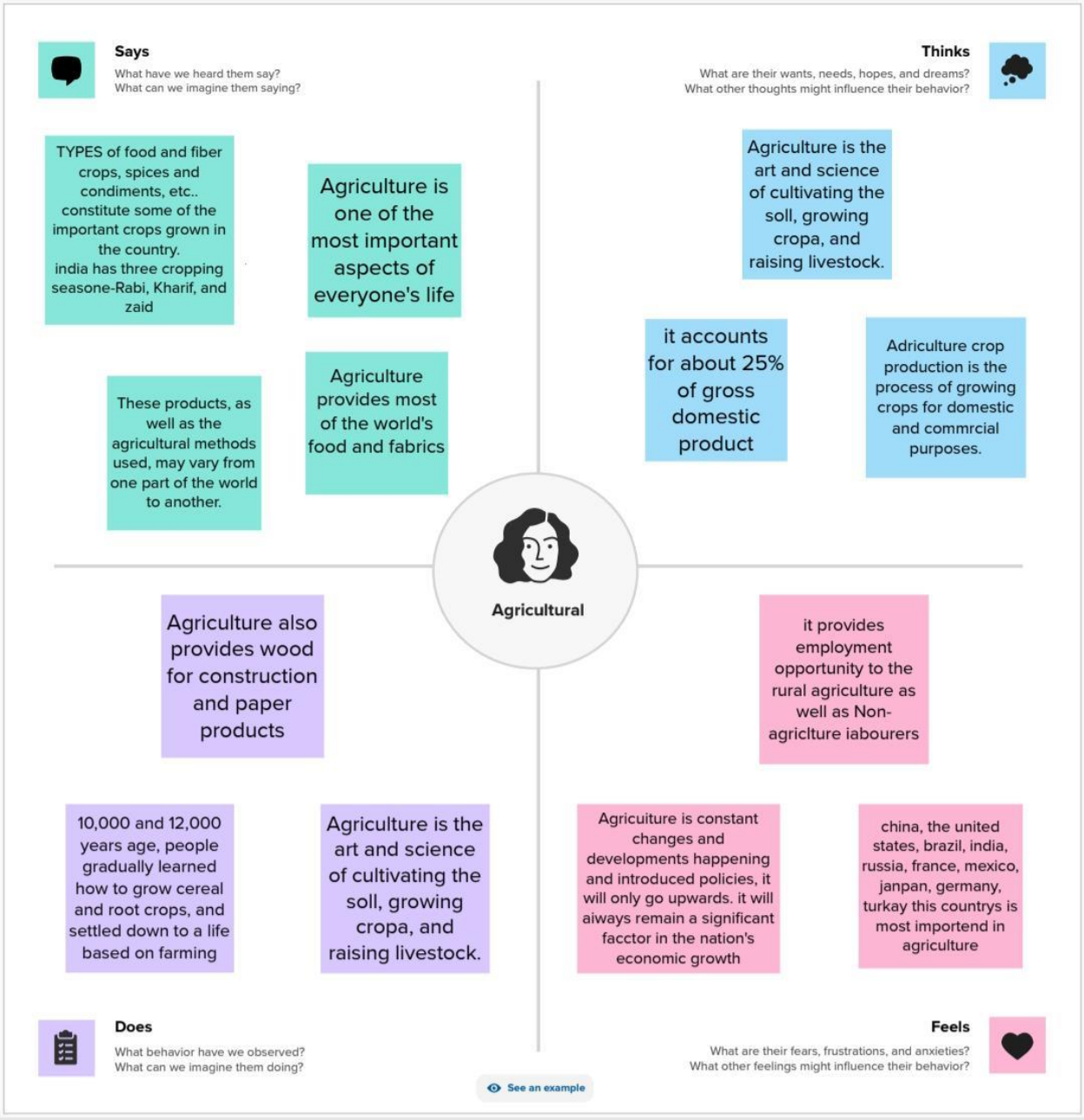
1.2.PURPOSE

- The purpose of conducting an analysis of India’s agricultural crop production between 1997 and 2021 is multi-faceted and holds significant importance. The analysis will also delve into the influence of government policies and subsidies on crop production. It aims to determine which policies have been successful and which need modification.

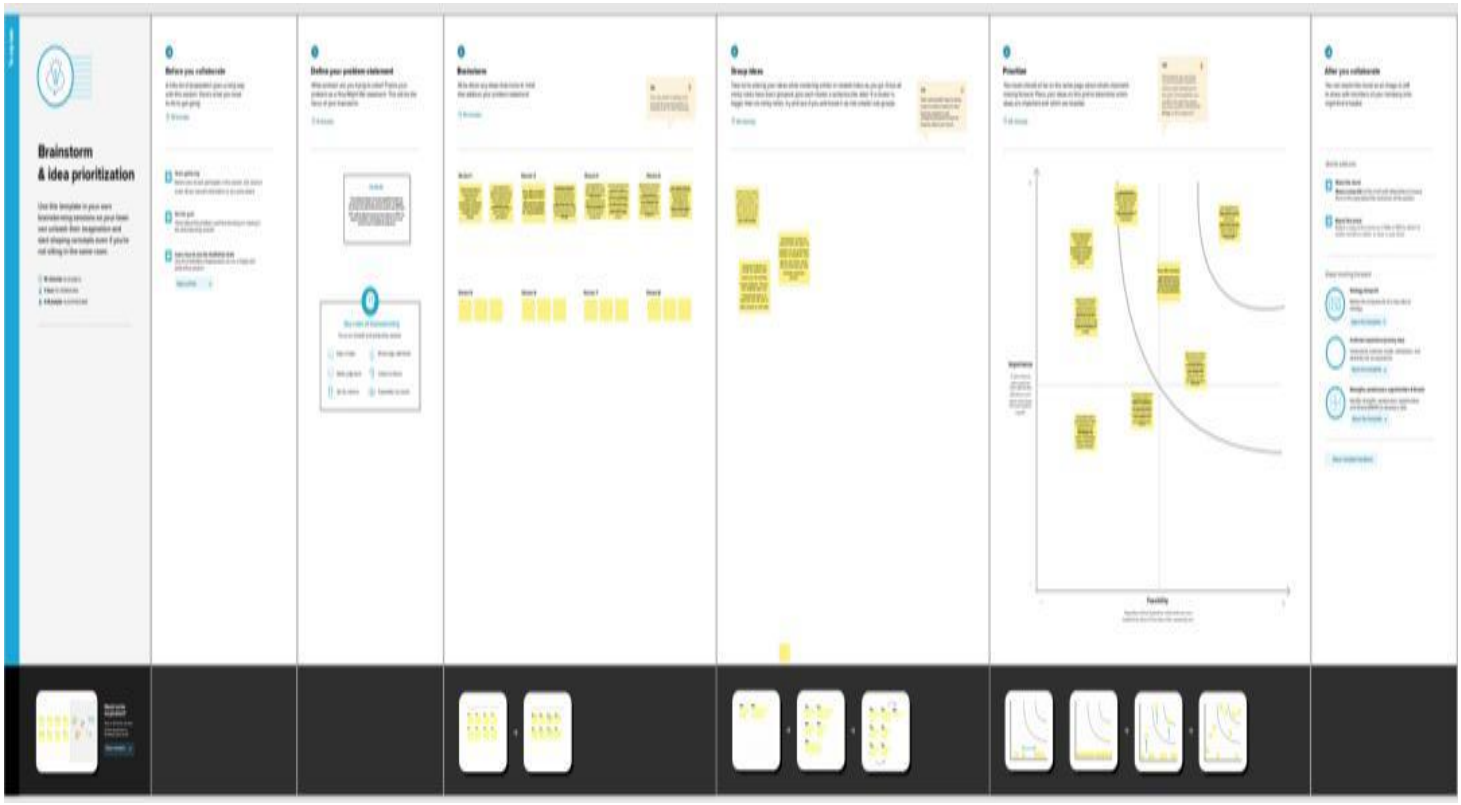
2.PROBLEM STATEMENT AND DESIGN THININKING :-

- Considering the influence of climate change, policy effectiveness, and sustainability, to ensure consistent food security and economic stability. Employing design thinking, we will empathize with farmers, define key issues impacting crop production, ideate innovative solutions, prototype new farming techniques, and test them to create a sustainable and resilient agricultural system.

2.1EMPATHY MAP

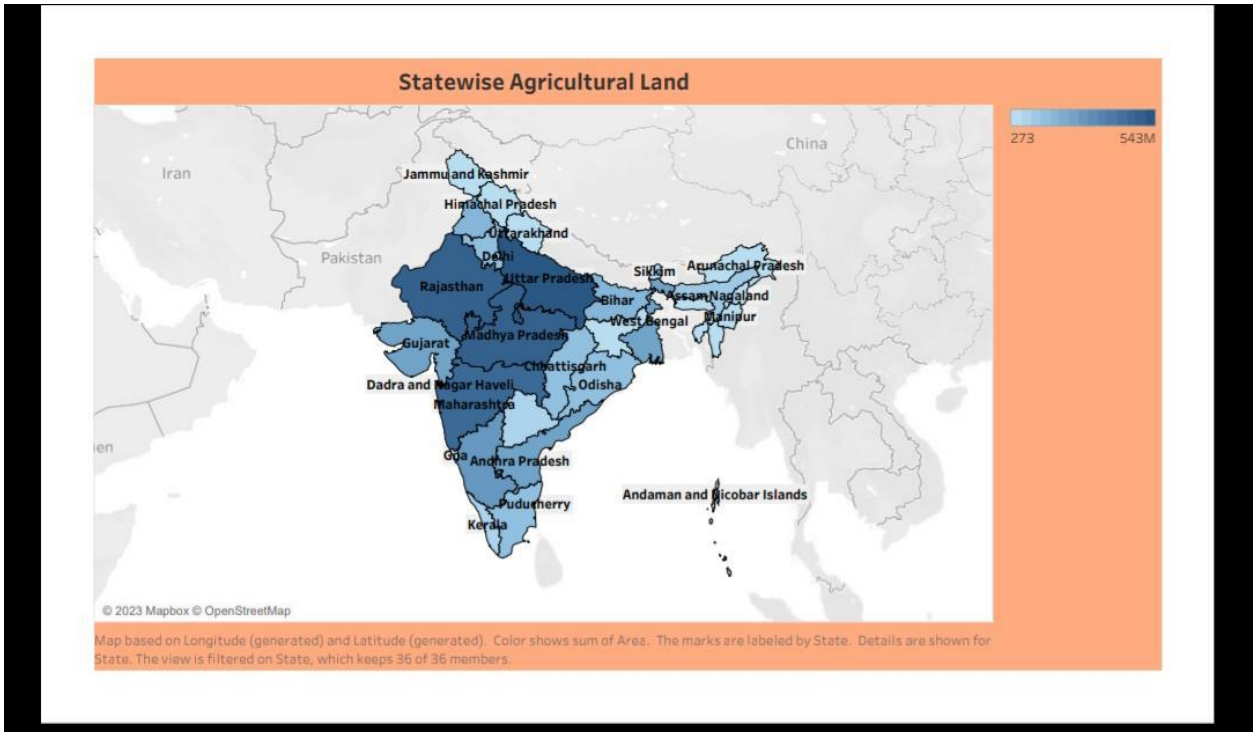


2.2 IDIATION AND BRAINSTORMING

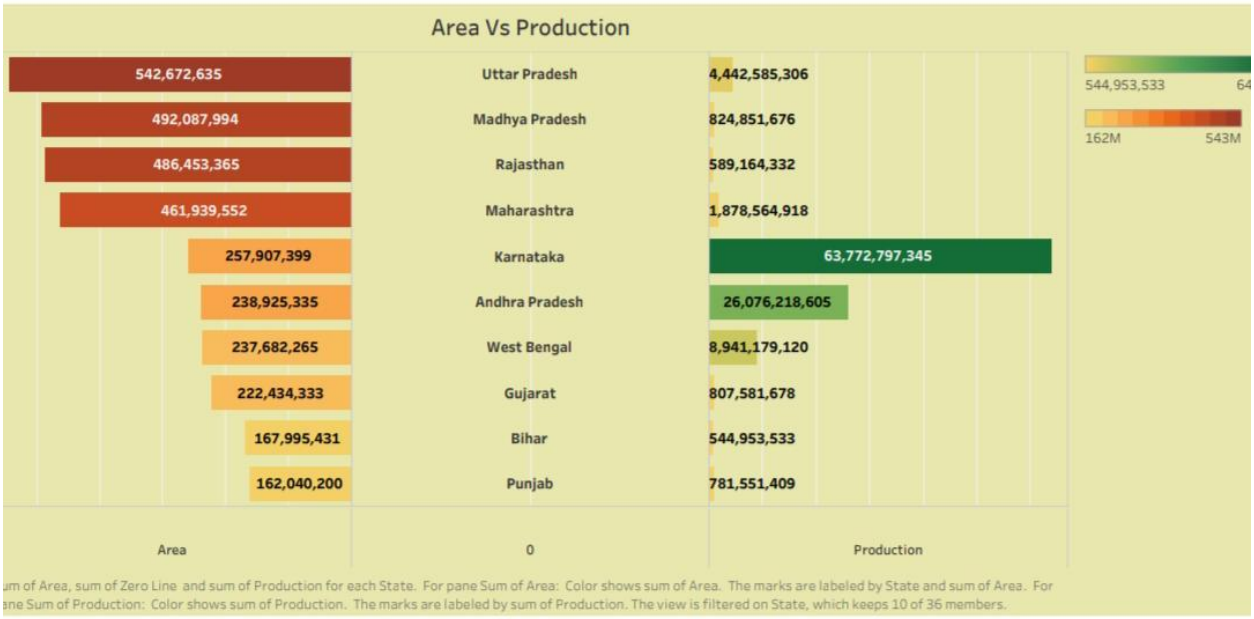


3.RESULT :-

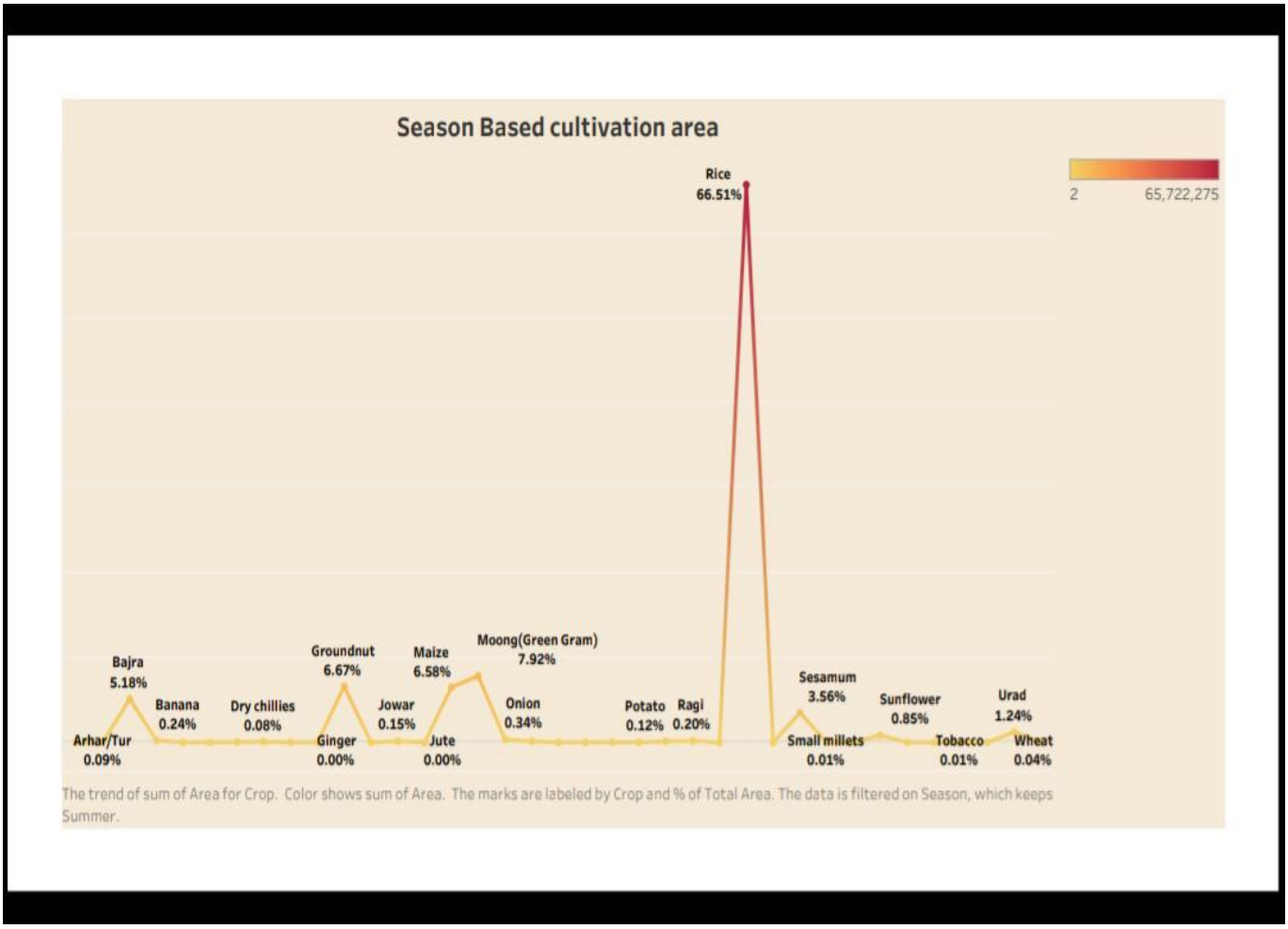
3.1. STATE WISE AGRICULTURAL LAND



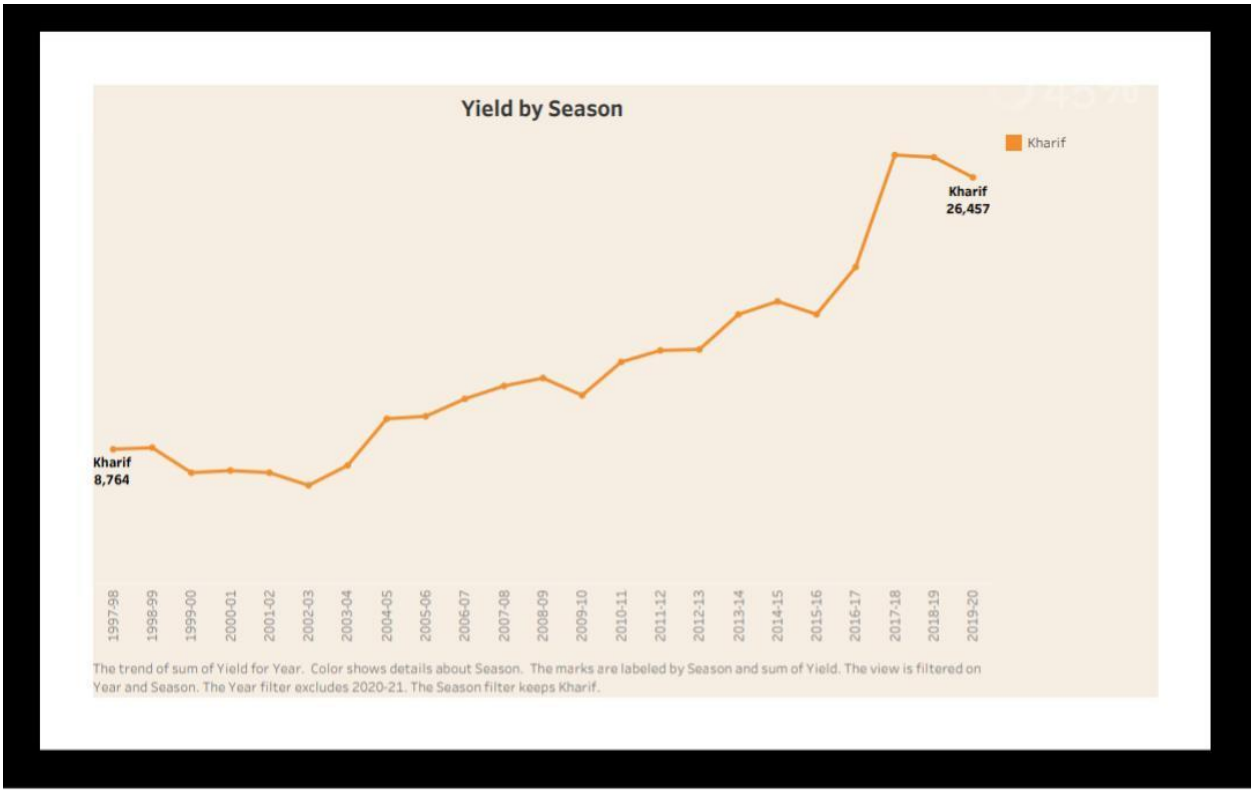
3.2 AREA VS PRODUCTION



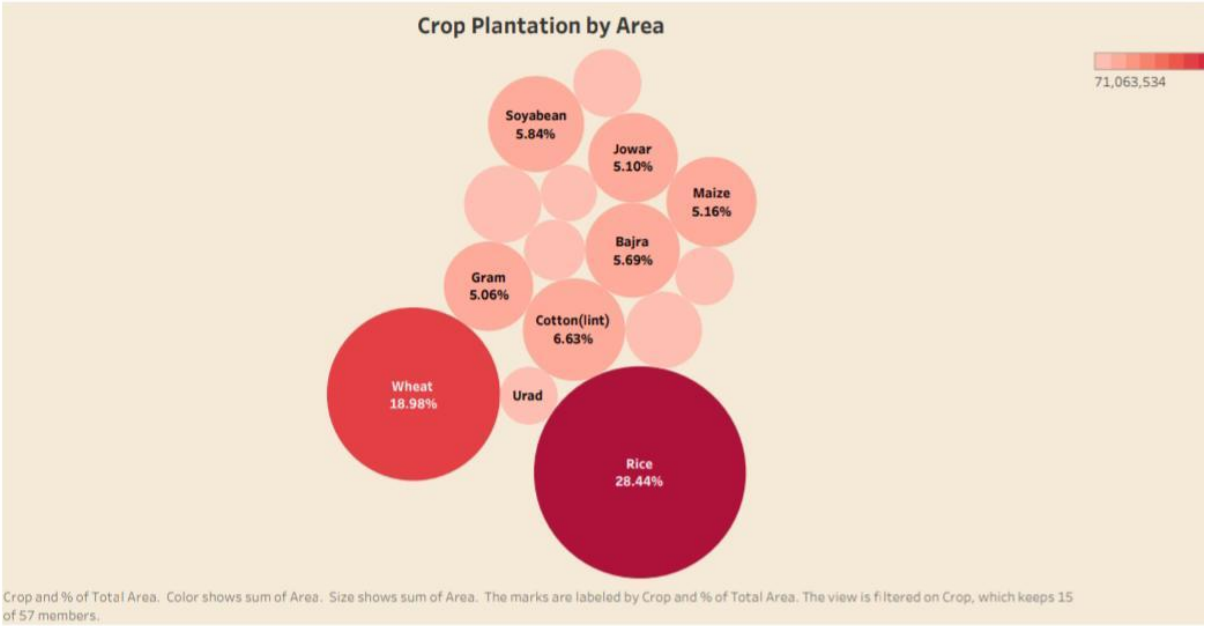
3.3.SEASON BASED CULTIVATION AREA



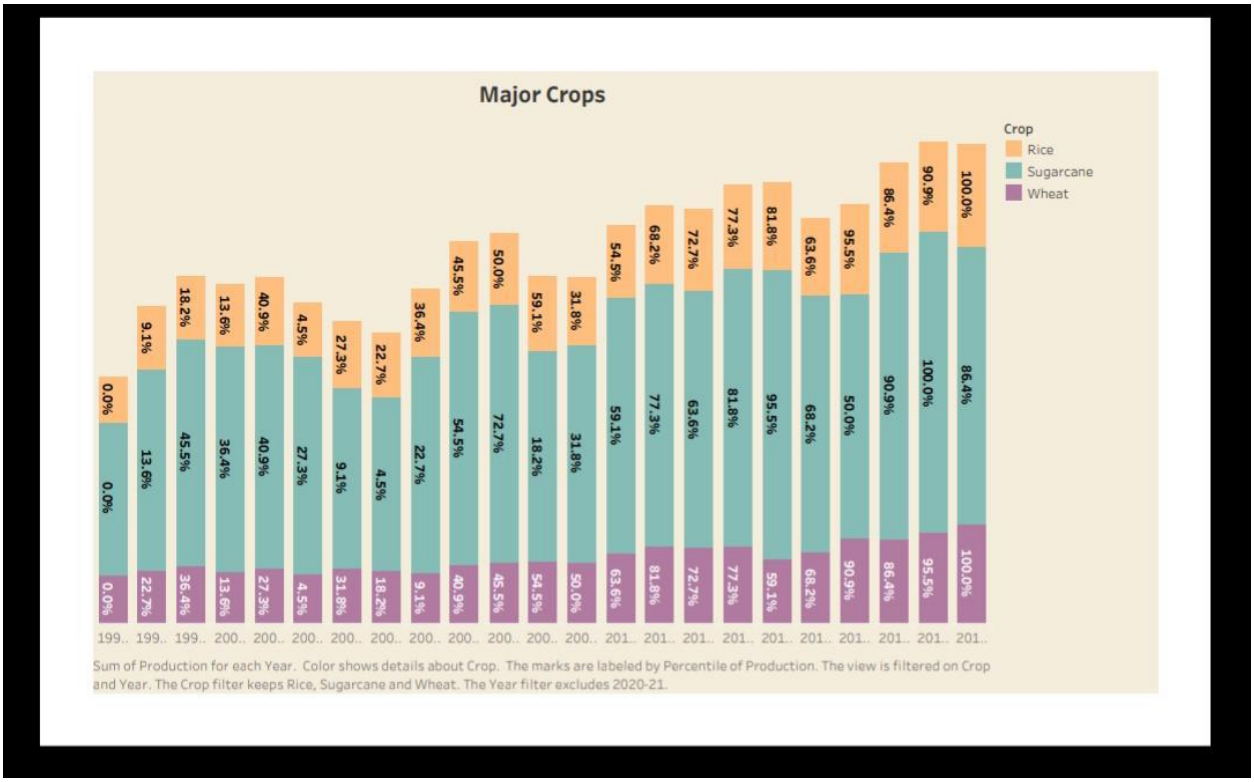
3.4. YIELD BY SEASON



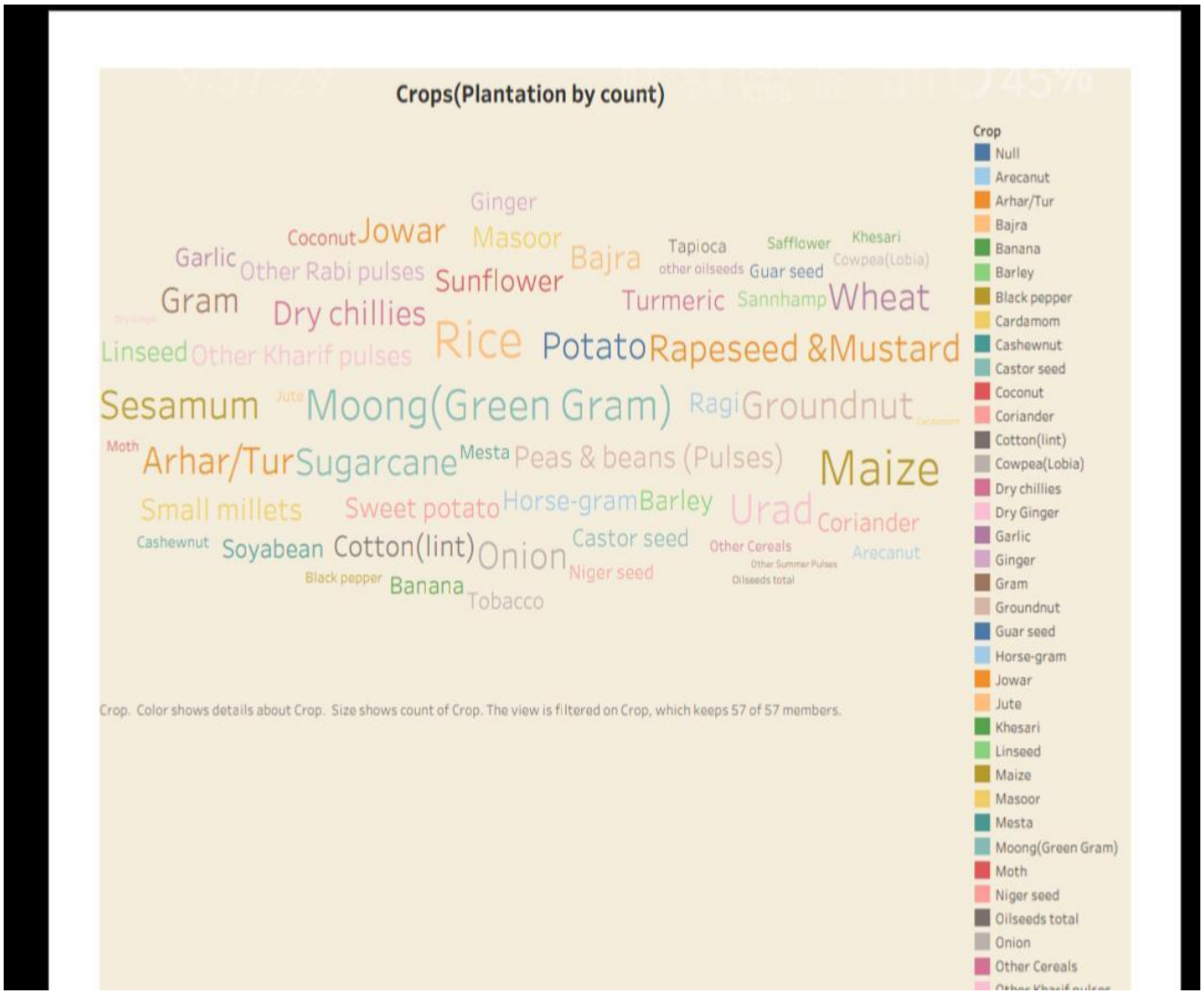
3.5. CROP PLANTATION BY AREA



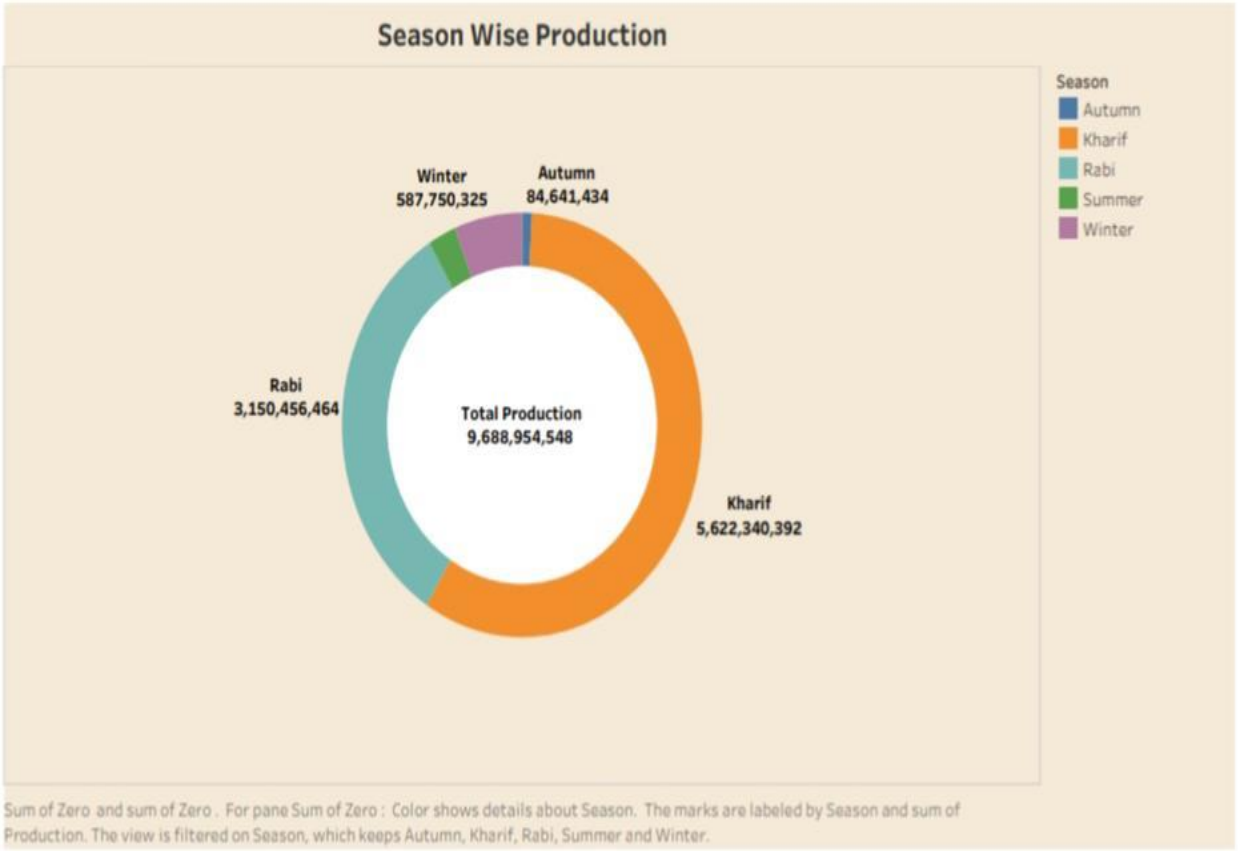
3.6. MAJOR CROPS



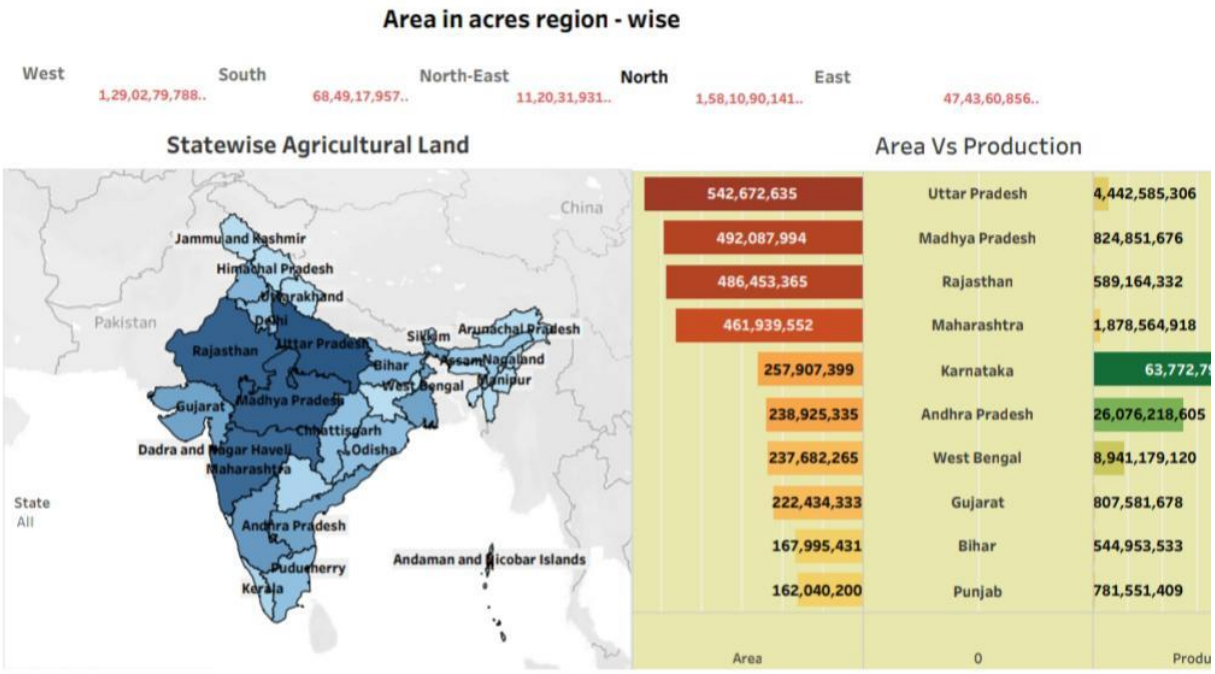
3.7. CROP (PLANTATION BY COUNT)



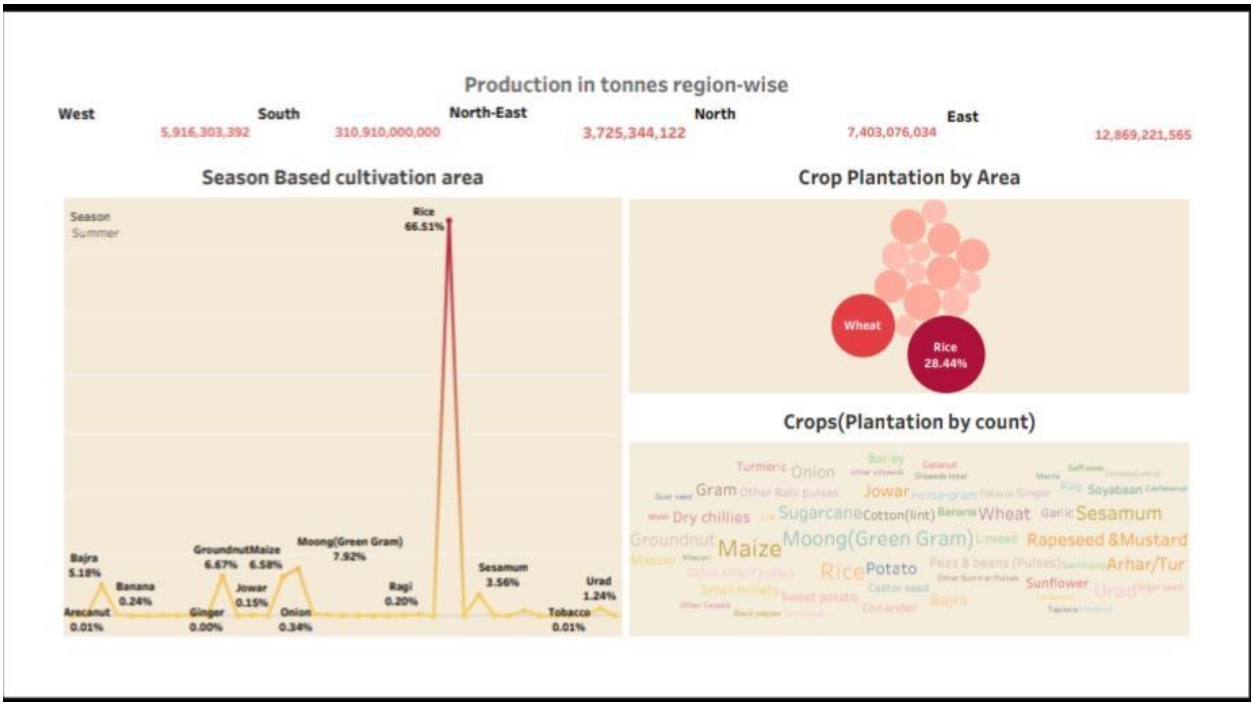
3.8. SEASON WISE PRODUTION



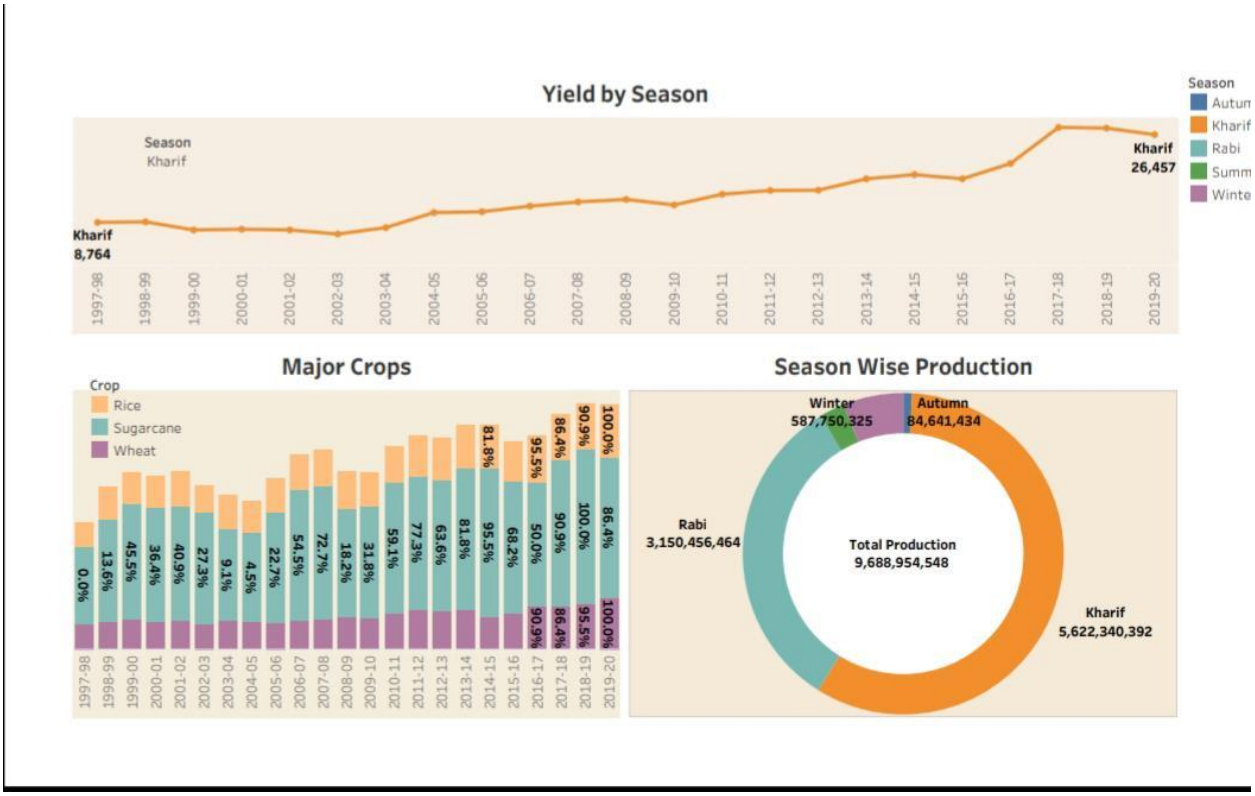
❖***DASHBOARD 1***


Area in acres region - wise
West
1,29,02,79,788..
South
68,49,17,957..
North-East
11,20,31,931..
North
1,58,10,90,141..
East
47,43,60,856..
Statewise Agricultural Land
China
Pakistan
Jammu and Kashmir
Himachal Pradesh
Uttarakhand
Delhi
Rajasthan
Uttar Pradesh
Sikkim
Arunachal Pradesh
Bihar
Assam
Nagaland
Manipur
West Bengal
Gujarat
Madhya Pradesh
Chhattisgarh
Odisha
Dadra and Nagar Haveli
Maharashtra
Andhra Pradesh
Puducherry
Kerala
Andaman and Nicobar Islands
State
All
Area Vs Production
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
63,772,7
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
Area
0
Produ

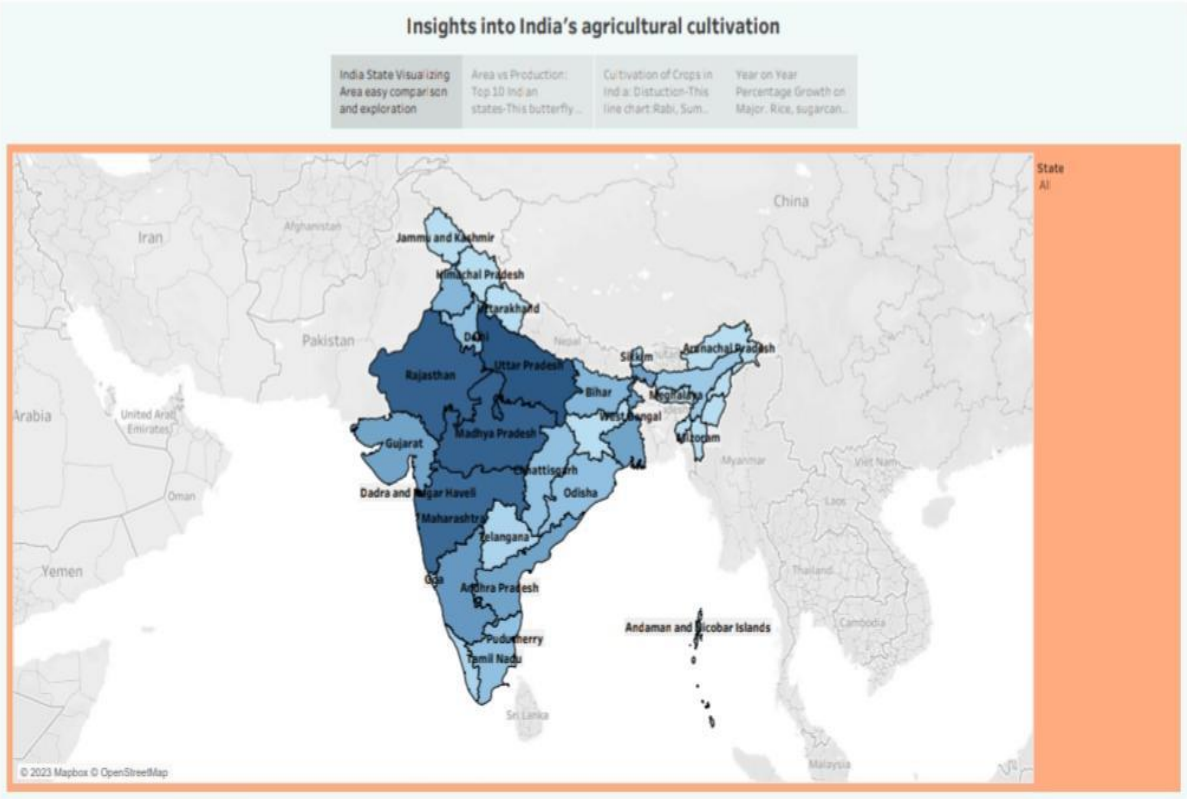
❖ ***DASHBOARD 2***

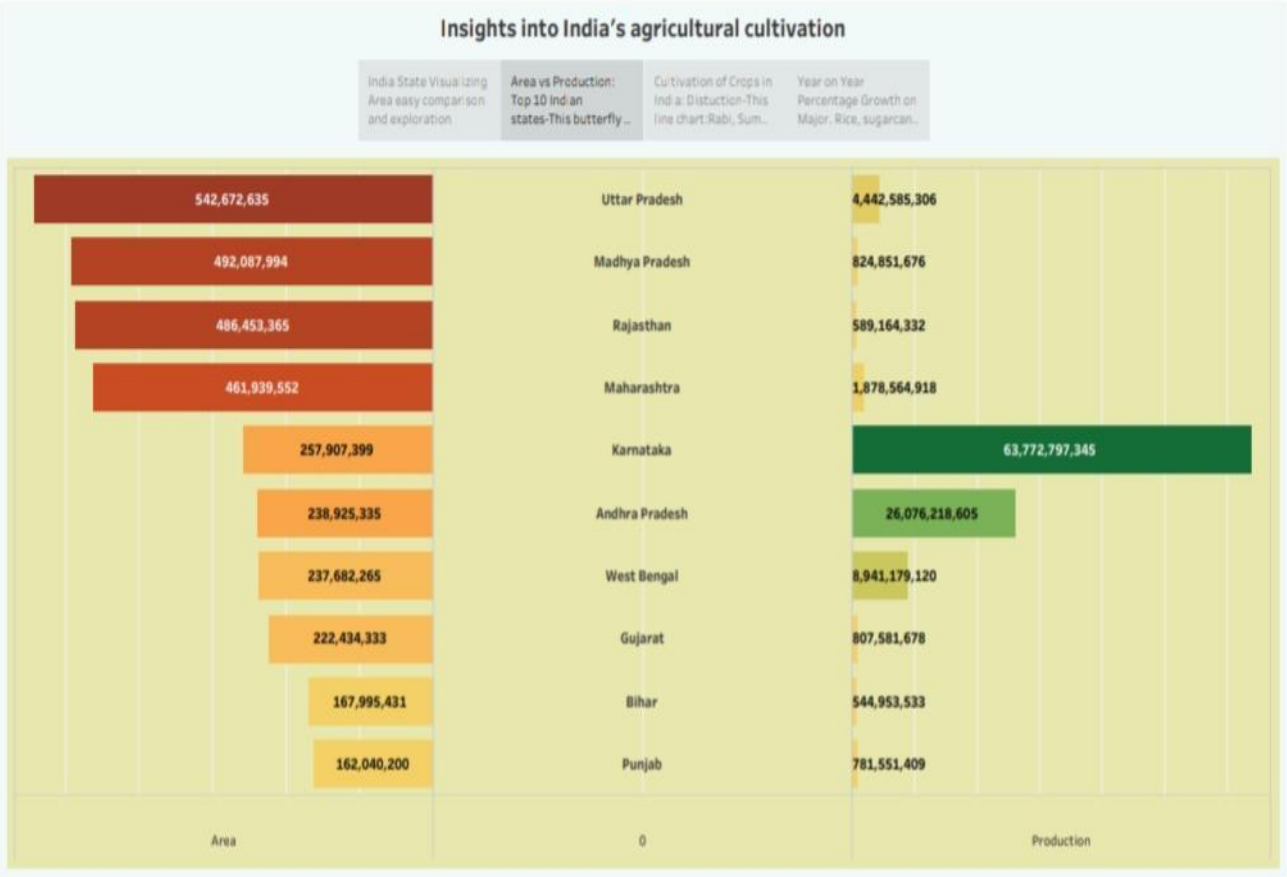

Production in tonnes region-wise
West
5,916,303,392
South
310,910,000,000
North-East
3,725,344,122
North
7,403,076,034
East
12,869,221,565
Season Based cultivation area
Season
Summer
Rice
66.51%
Bajra
5.18%
Banana
0.24%
Arecanut
0.01%
GroundnutMaize
6.67%
6.58%
Ginger
0.00%
Jowar
0.15%
Moong(Green Gram)
7.92%
Onion
0.34%
Ragi
0.20%
Sesamum
3.56%
Urad
1.24%
Tobacco
0.01%
Crop Plantation by Area
Wheat
Rice
28.44%
Crops(Plantation by count)
Turmeric
Onion
Barley
Gram
Other Rabi pulses
Jowar
Soyabean
Dry chillies
Sugarcane
Cotton(lint)
Banana
Wheat
Garlic
Sesamum
Groundnut
Maize
Moong(Green Gram)
Rapeseed &Mustard
Rice
Potato
Arhar/Tur
Sunflower
Urad
Castor seed
Coriander
Bajra

❖ ***DASHBOARD 3***


Yield by Season
Season
Kharif
Kharif
8,764
Kharif
26,457
Season
Autum
Kharif
Rabi
Summ
Winte
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
Major Crops
Crop
Rice
Sugarcane
Wheat
0.0%
13.6%
45.5%
36.4%
40.9%
27.3%
9.1%
4.5%
22.7%
54.5%
72.7%
18.2%
31.8%
59.1%
77.3%
63.6%
81.8%
95.5%
68.2%
50.0%
90.9%
86.4%
90.9%
100.0%
95.5%
86.4%
100.0%
Season Wise Production
Winter
587,750,325
Autumn
84,641,434
Rabi
3,150,456,464
Total Production
9,688,954,548
Kharif
5,622,340,392

❖ STORY 1


Insights into India's agricultural cultivation
India State Visualizing Area easy comparison and exploration
Area vs Production: Top 10 Indian states-This butterfly...
Cultivation of Crops in India: Distuction-This line chart Rabi, Sum...
Year on Year Percentage Growth on Major. Rice, sugarcan...
China
Iran
Afghanistan
Pakistan
Nepal
Arabia
United Arab Emirates
Oman
Yemen
Myanmar
Viet Nam
Laos
Thailand
Cambodia
Malaysia
Sri Lanka
Jammu and Kashmir
Himachal Pradesh
Uttarakhand
Delhi
Rajasthan
Uttar Pradesh
Sikkim
Arunachal Pradesh
Bihar
Meghalaya
West Bengal
Mizoram
Gujarat
Madhya Pradesh
Chhattisgarh
Dadra and Nagar Haveli
Odisha
Maharashtra
Telangana
Goa
Andhra Pradesh
Puducherry
Tamil Nadu
Andaman and Nicobar Islands
State
Al
© 2023 Mapbox © OpenStreetMap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542,672,635
Uttar Pradesh
4,442,585,306
492,087,994
Madhya Pradesh
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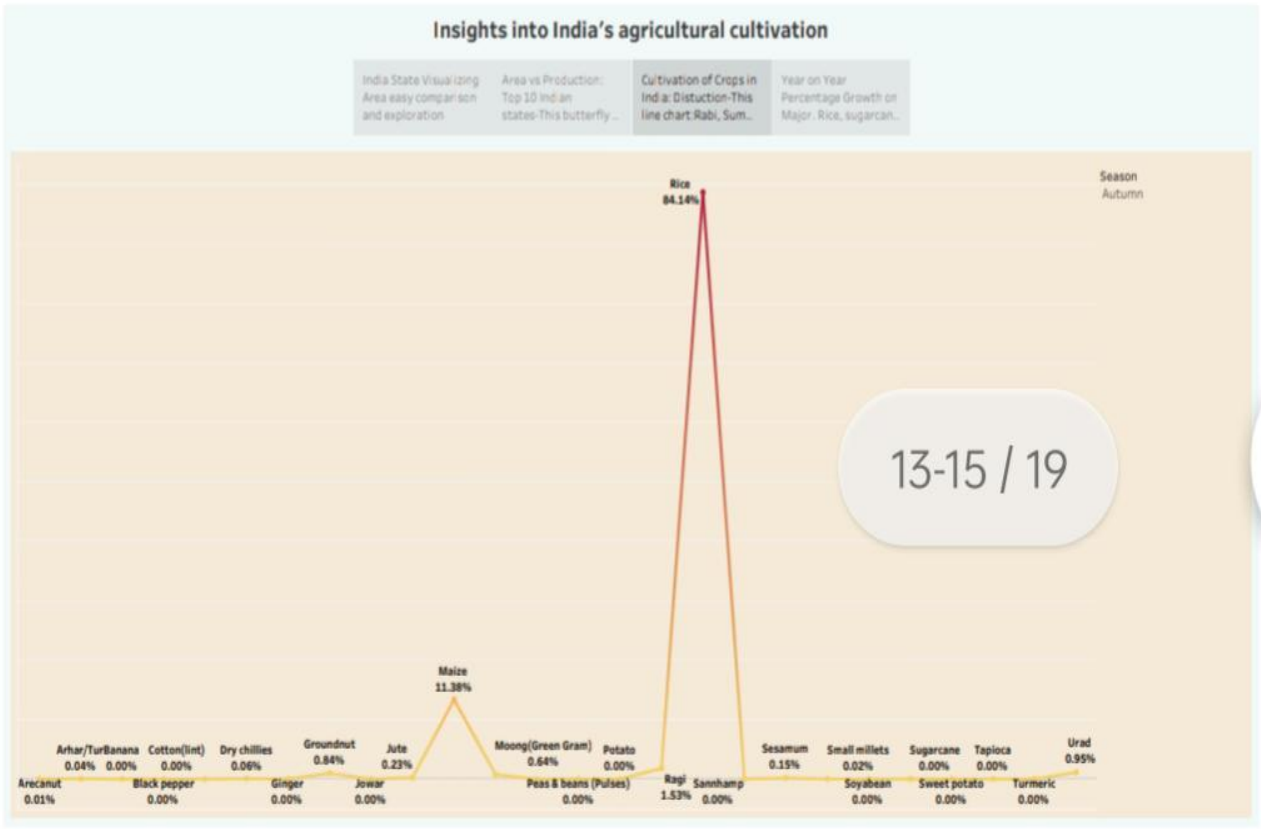
Rajasthan
589,164,332
461,939,552
Maharashtra
1,878,564,918
257,907,399
Karnataka
63,772,797,345
238,925,335
Andhra Pradesh
26,076,218,605
237,682,265
West Bengal
8,941,179,120
222,434,333
Gujarat
807,581,678
167,995,431
Bihar
544,953,533
162,040,200
Punjab
781,551,409
Area
0
Production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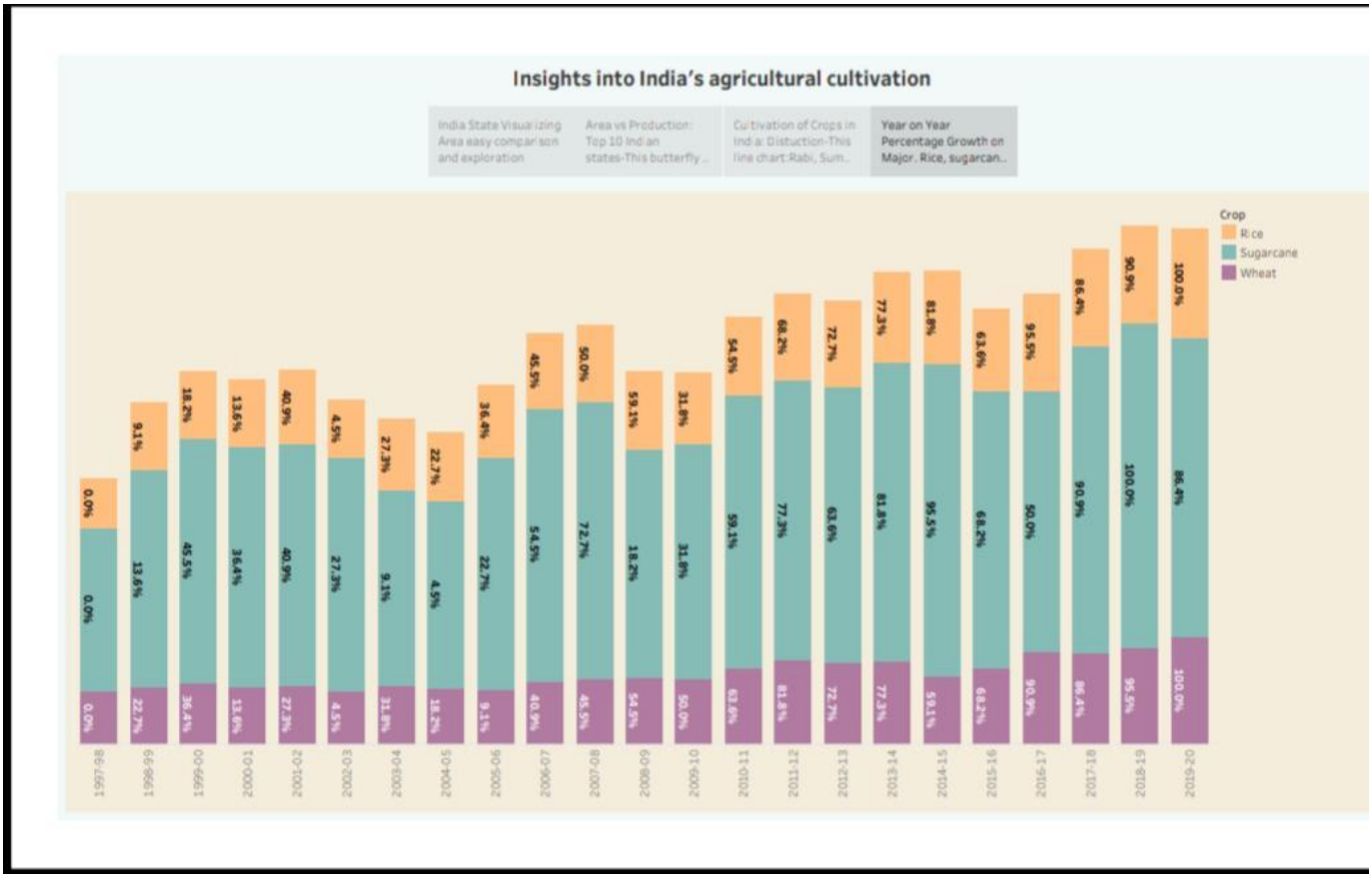
Area vs Production: Top 10 Indian states-This butterfly ...
Cultivation of Crops in India: Distuction-This line chart Rabi, Sum...
Year on Year Percentage Growth on Major. Rice, sugarcan...
Season
Autumn
Rice 84.14%
Maize 11.38%
Groundnut 0.84%
Jute 0.23%
Moong(Green Gram) 0.64%
Potato 0.00%
Ragi 1.53%
Sannhamp 0.00%
Sesamum 0.15%
Small millets 0.02%
Sugarcane 0.00%
Tapioca 0.00%
Urad 0.95%
Arhar/TurBanana 0.04%
Cotton(lint) 0.00%
Dry chillies 0.06%
Arecanut 0.01%
Black pepper 0.00%
Ginger 0.00%
Jowar 0.00%
Peas & beans (Pulses) 0.00%
Soyabean 0.00%
Sweet potato 0.00%
Turmeric 0.00%
13-15 / 19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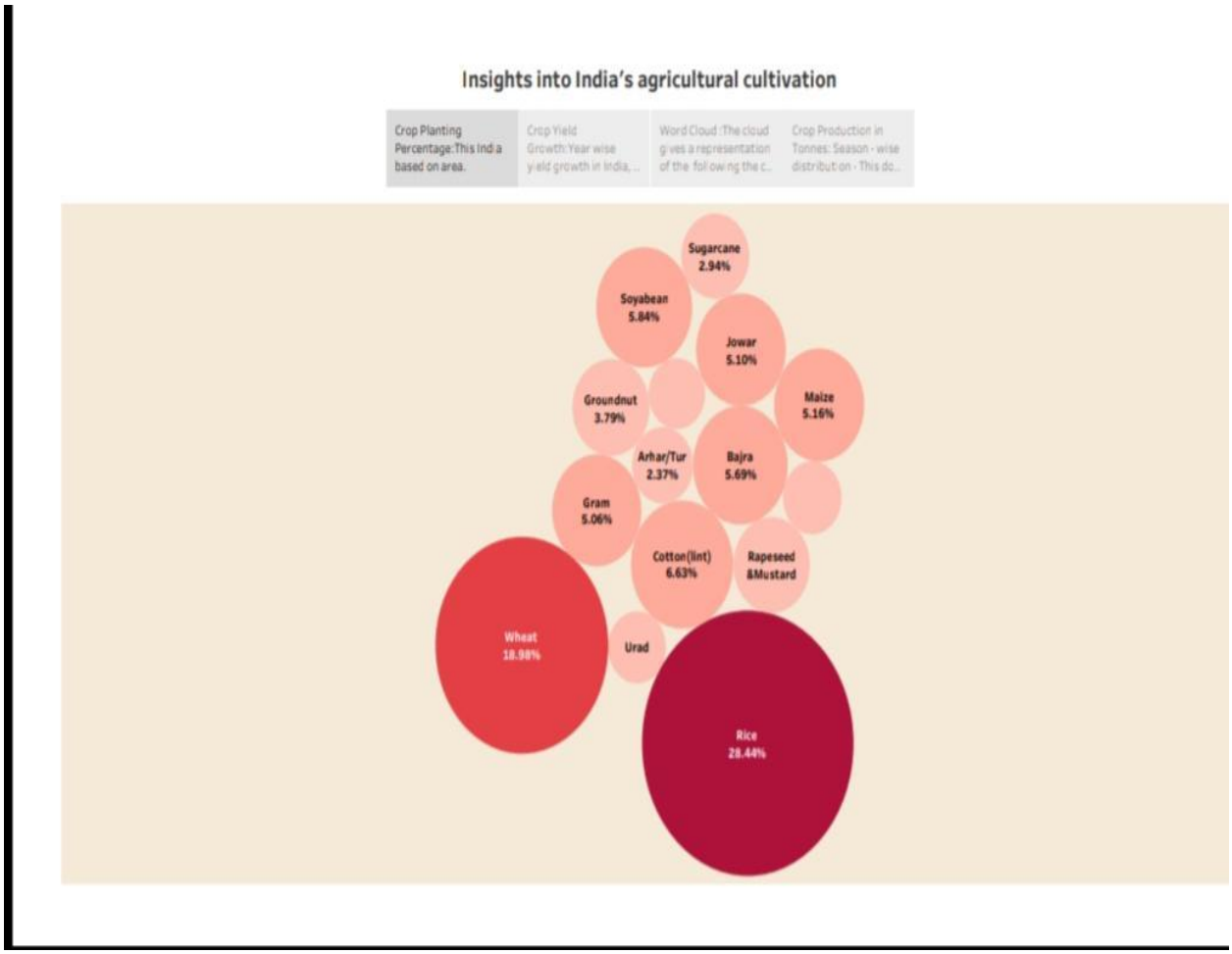
Crop
Rice
Sugarcane
Wheat
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20

❖ STORY 2


Insights into India's agricultural cultivation
Crop Planting Percentage:This ind a based on area.
Crop Yield Growth:Year wise y eld growth in India, ..
Word Cloud :The cloud g ves a representation of the fol ow ng the c..
Crop Production in Tonnes: Season - wise distribut on - This do..
Sugarcane 2.94%
Soyabean 5.84%
Jowar 5.10%
Groundnut 3.79%
Maize 5.16%
Arhar/Tur 2.37%
Bajra 5.69%
Gram 5.06%
Cotton(lint) 6.63%
Rapeseed &Mustard
Wheat 18.98%
Urad
Rice 28.44%

Insights into India's agricultural cultivation

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Crop Yield Growth:Year wise yield growth in India, ..

Word Cloud :The cloud gives a representation of the following the c..

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Insights into India's agricultural cultivation

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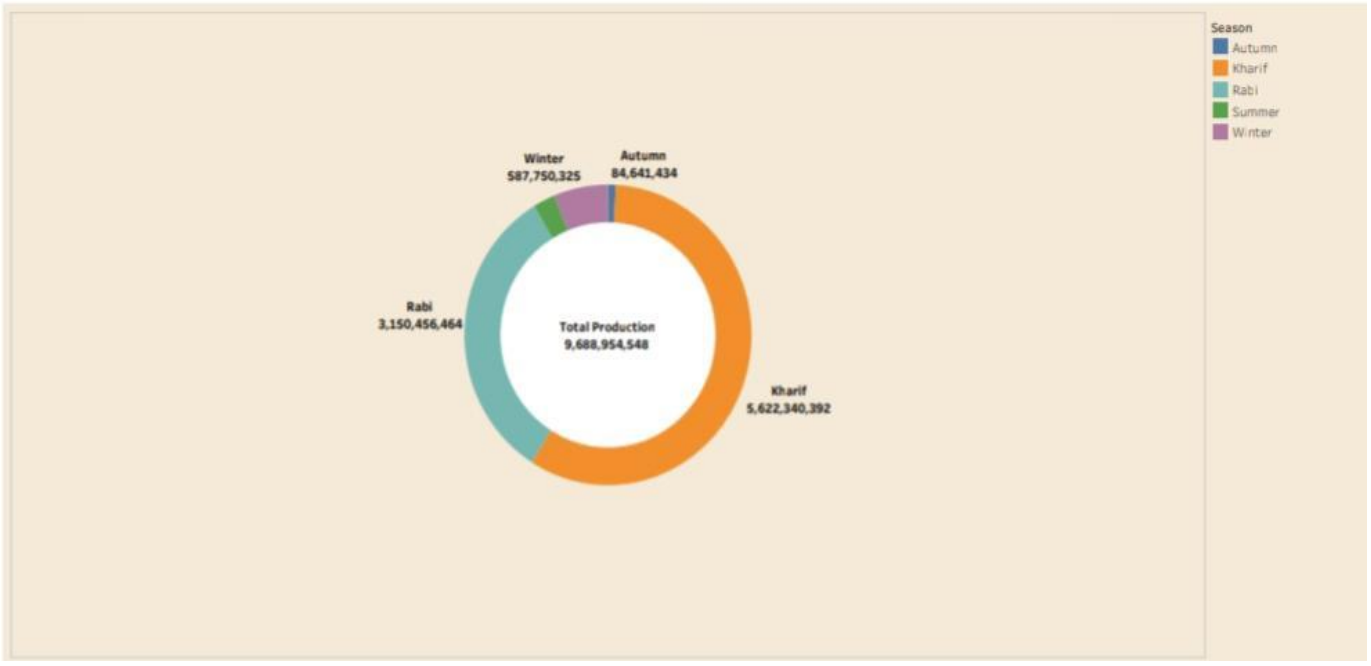

4. ADVANTAGES AND DISADVANTAGES :-

4.1. Advantages

- ❖ Diverse Crop Portfolio: India's varied agro-climatic zones enable the cultivation of a wide range of crops, from rice and wheat to fruits, vegetables, and spices. This diversity enhances food security and income opportunities for farmers.

- ❖ Increased Crop Yield: The period has witnessed significant increases in crop yields due to advancements in agricultural practices, improved seeds, and better irrigation systems. This has resulted in higher agricultural productivity.

- ❖ Sustainability Initiatives: The introduction of sustainable farming practices, such as organic farming and integrated pest management, has gained traction. These practices promote soil health and reduce the reliance on chemical inputs.

- ❖ Crop Diversification: There has been a growing shift from traditional crops to high-value cash crops, like horticulture and floriculture. This diversification offers better income prospects for farmers.

- Technological Adoption: The adoption of technology in agriculture has increased, with farmers using smartphones for real-time information on weather, market prices, and crop management. This has empowered farmers to make data-driven decisions.

- Government Support: Various government schemes and subsidies have been launched to support farmers, including PM-KISAN, soil health cards, and crop insurance programs. These initiatives aim to enhance farm income and reduce risks.

- Market Access: Improvements in transportation infrastructure have facilitated better access to markets. Farmers can now reach a broader consumer base, leading to increased income potential.

- Export Opportunities: India's agricultural exports have seen growth, particularly in sectors like rice, spices, and marine products. This provides additional income sources and foreign exchange earnings.

- Climate-Resilient Crops: The adoption of climate-resilient crop varieties is helping farmers cope with changing weather patterns, ensuring stable production in the face of climate change challenges.

- Sustainable Livelihoods: Agriculture continues to be a major source of livelihood for a significant portion of India's population, including small and marginal farmers. Improved agricultural practices translate to better livelihoods.

4.2 Disadvantages

- Volatility in Crop Yields: India's agriculture is highly dependent on monsoons, making crop yields vulnerable to unpredictable weather patterns, leading to fluctuations in production from year to year.

- Land Degradation: Soil erosion, overuse of fertilizers, and deforestation have contributed to land degradation, reducing crop yields and overall agricultural productivity.

- Water Scarcity: Many parts of India have faced water scarcity issues, affecting the availability of irrigation for crops. This has a significant impact on crop production, especially in rain-fed regions.

- Inadequate Irrigation Infrastructure: The irrigation infrastructure in India has often been inadequate and inefficient, leading to a lack of consistent water supply for crops.

- Pesticide and Chemical Overuse: The excessive use of pesticides and chemical fertilizers has raised concerns about environmental degradation and health risks, while also impacting soil fertility in the long term.

- Small Landholdings: The prevalence of small and fragmented landholdings makes it challenging for farmers to adopt modern farming practices and access credit for investments in agriculture.

- Crop Diversification: There has been a historical bias in favor of rice and wheat, resulting in reduced crop diversification. This can make farming systems vulnerable to pest outbreaks and price fluctuations.

- Price Fluctuations: Farmers often face price volatility, where they are unable to predict or control the prices at which they can sell their crops, affecting their income and livelihood.

- Lack of Agricultural Mechanization: The limited adoption of modern farm equipment and mechanization in agriculture leads to labor-intensive farming practices, which can be inefficient and less productive.

- Post-Harvest Losses: Inadequate infrastructure and storage facilities contribute to significant post-harvest losses, reducing the overall availability of agricultural produce.

5.FUTURESCOPE :-

1. Precision Agriculture: Future analysis can delve into the application of technology and data analytics for precision agriculture. This includes using data to optimize crop planting, irrigation, and fertilizer usage, which can improve yield and resource efficiency.

2. Crop Diversification: As India faces challenges related to climate change and water scarcity, analysis can focus on the diversification of crops. Identifying alternative crops that are more resilient to changing conditions can be critical.

3. Market Trends and Export Opportunities: Analyzing crop production data can help in identifying trends in demand and export opportunities. Understanding which crops have a growing market domestically and internationally can guide farmers and policymakers.

4. Climate Resilience: India's agriculture is susceptible to climate-related risks. Future analysis can assess how crop production methods and choices are evolving to address these challenges, including the adoption of drought-resistant varieties and climate-smart agricultural practices.

5. Government Policies and Support: The role of government policies, subsidies, and support in shaping crop production can be a key focus. Analyzing the impact of policies on crop choice, production practices, and market access is essential for policy evaluation and reform.

6. Technology Adoption: Future analysis can explore the rate at which Indian farmers are adopting modern farming technologies, such as mechanization, IoT, and data-driven decision-making tools.

7. Data-Driven Decision-Making: As technology adoption increases, there's a growing potential for data-driven decision-making in agriculture. The analysis can explore how data analytics is being utilized in crop planning, monitoring, and yield prediction.

6. APPLICATION :-

1. Policy Formulation: Government bodies can utilize this data to formulate agricultural policies. Understanding crop production trends, fluctuations, and the impact of climate change helps in making informed decisions on subsidies, crop insurance, and resource allocation.

2. Food Security: The analysis can help assess the country's food security by tracking the production of staple crops. It aids in identifying potential food shortages and planning imports or distribution of food to areas in need.

3. Crop Yield Improvement: Farmers and agricultural experts can use this data to identify regions or time periods where crop yields have been consistently low. This information can guide efforts to improve crop production through better farming practices and technologies.

4. Risk Management: Insurance companies can use historical crop production data to design and offer crop insurance products. Farmers can be protected against losses due to crop failures caused by adverse weather or other factors.

5. Market Forecasting: Agribusinesses and traders can use this data to forecast market conditions. It helps in anticipating supply and demand, which can be critical for setting prices and making supply chain decisions.

6. Climate Change Adaptation: Understanding how crop production has been affected by climate change is vital for adapting agricultural practices. Farmers can change planting times or crop varieties to cope with shifting weather patterns.

7. Research and Development: Researchers can use the data to study long-term trends in crop production, investigate the effects of agricultural policies, and conduct studies on improving crop varieties and farming techniques.

8. Agricultural Education: Educational institutions can incorporate this data into their curriculum to help students understand the dynamics of crop production in India over the years.

7.APPENDIX :-

- Data Tables: Detailed tables presenting crop production data for various years, regions, and crop types. These tables may include production quantities, yields, and other relevant metrics.

- Charts and Graphs: Visual representations of the data, such as line charts, bar charts, and pie charts, illustrating trends and variations in crop production over time.

- Statistical Analysis: Results of statistical tests, regression analyses, or other quantitative analyses that provide insights into the factors influencing crop production.

- Comparative Analysis: Tables or charts comparing crop production in different states or regions, or comparing the production of different crops within a specific region.

- Historical Context: Historical data and context, which can help readers understand how crop production trends have evolved over the years.

- Methodology: Detailed descriptions of the data collection methods, sources of data, and any statistical techniques or models used in the analysis.

- Supplementary Information: Any additional information that supports or complements the main findings or conclusions of the analysis.

- References: Citations or references to sources of data, research papers, or other materials used in the analysis.