Project Report

Indian Agriculture Crop Production Analysis(1997-2021)

1. Introduction

1.1 Overview

Agriculture is the backbone of our country. To analyze the cultivation of various crops based on the actors such as land area, soil and climatic conditions. Data set of various crop production during 1996-2021 have been collected and incorporated in Tableau desktop. Various visualizations created depend on area, production, crop variety season and time period. Finally, dashboards and stories have created and published in the tableau public.

Insights of Project

1) Key crops by production over the years

2) Relationship between area under production and production

3) The magnitude of production

4) Changes in crop production pattern over the years

1.2 Purpose

The prime idea behind this project to predict the high yielding crop of our country. Several actors have been considered such as area, production, crop variety season and time period. State wise crop cultivation analyzed and the major crops which are to be cultivated are identified. In Tamil Nadu major crop cultivated is rice and during winter and summer it has a tremendous growth in cultivation. So, its important to increase its yield for all seasons to meet out the demand employing the software tools like Tableau.

2. Problem Definition and Design Thinking

To analyze the India's crop cultivation based on the factors such as seasonal variations, regional distribution, and overall production trends and explore the insights of Indian crop cultivation through the visualization of the agriculture using tableau tools providing an interactive atmosphere among the students

2.1 Empathy Map
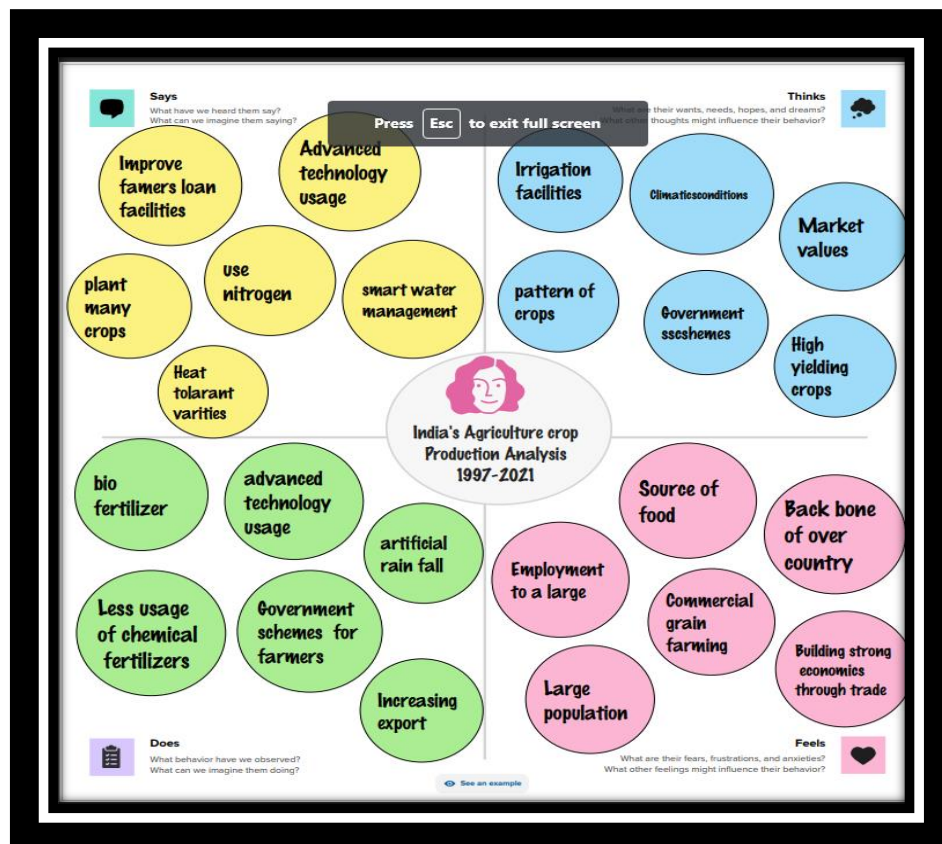
2.2 Ideation and Brainstorming Map
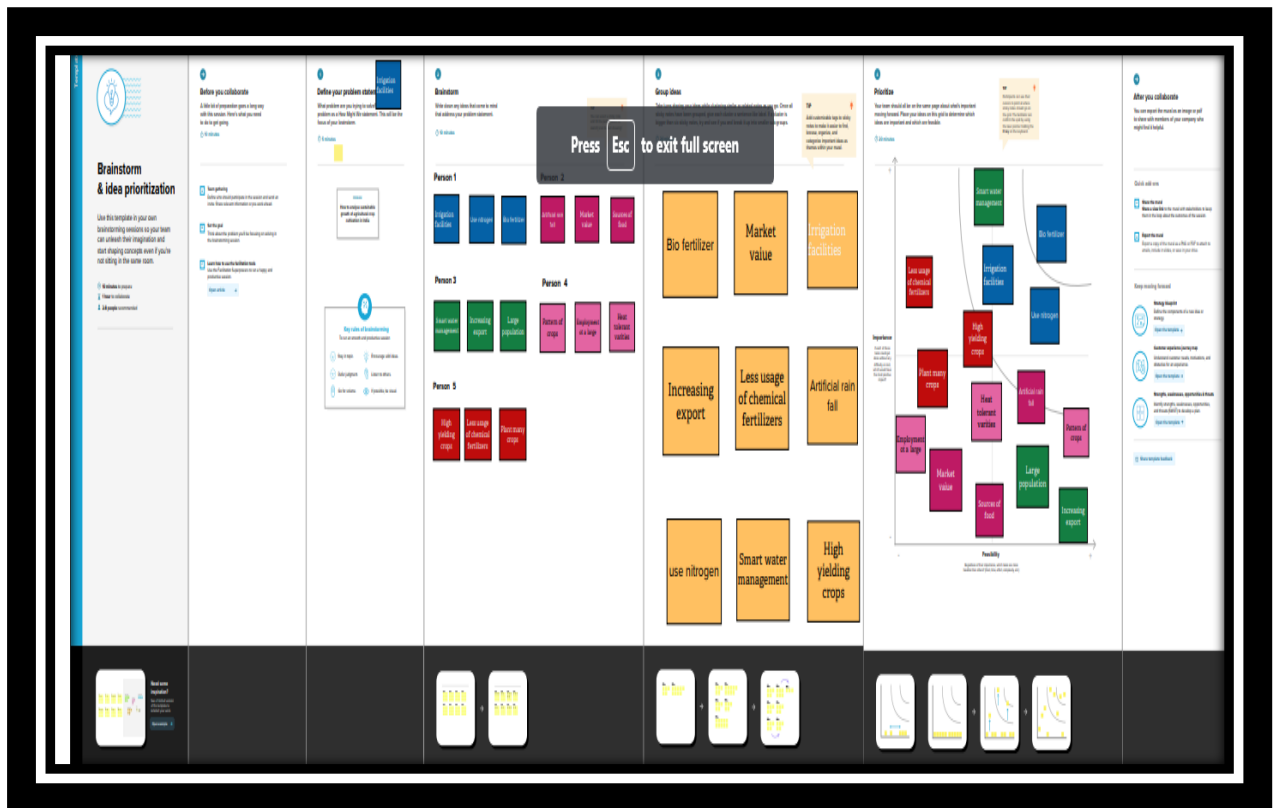
3.   RESULTS

Statewise Agriculture Land
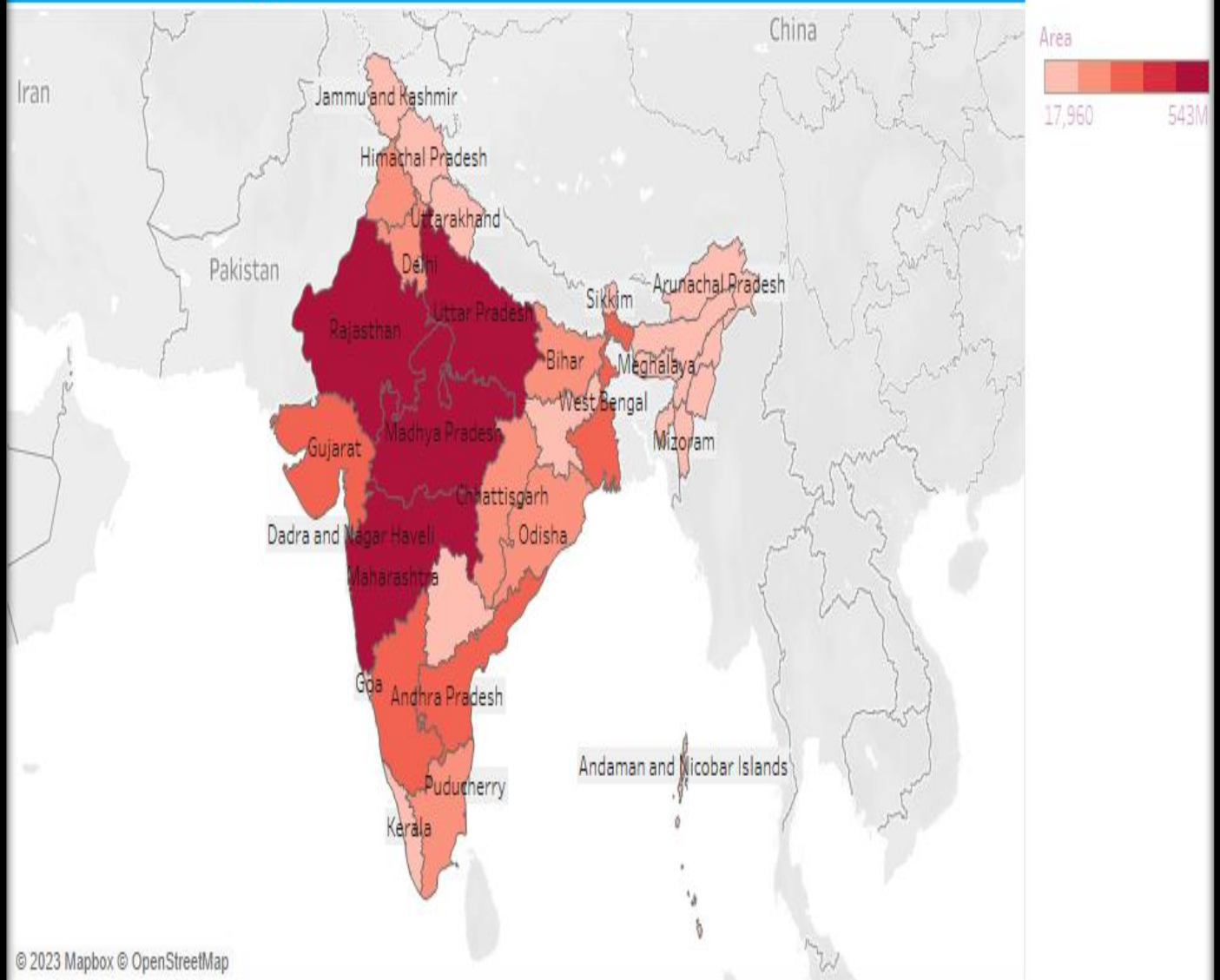
Map based on Longitude (generated) and Latitude (generated). Color shows sum of Area. The marks are labeled by State. Details are shown for State. The view is filtered on State, Latitude (generated) and Longitude (generated). The State filter keeps 36 of 36 members. The Latitude (generated) filter keeps non-Null values only. The Longitude (generated) filter keeps non-Null values only.

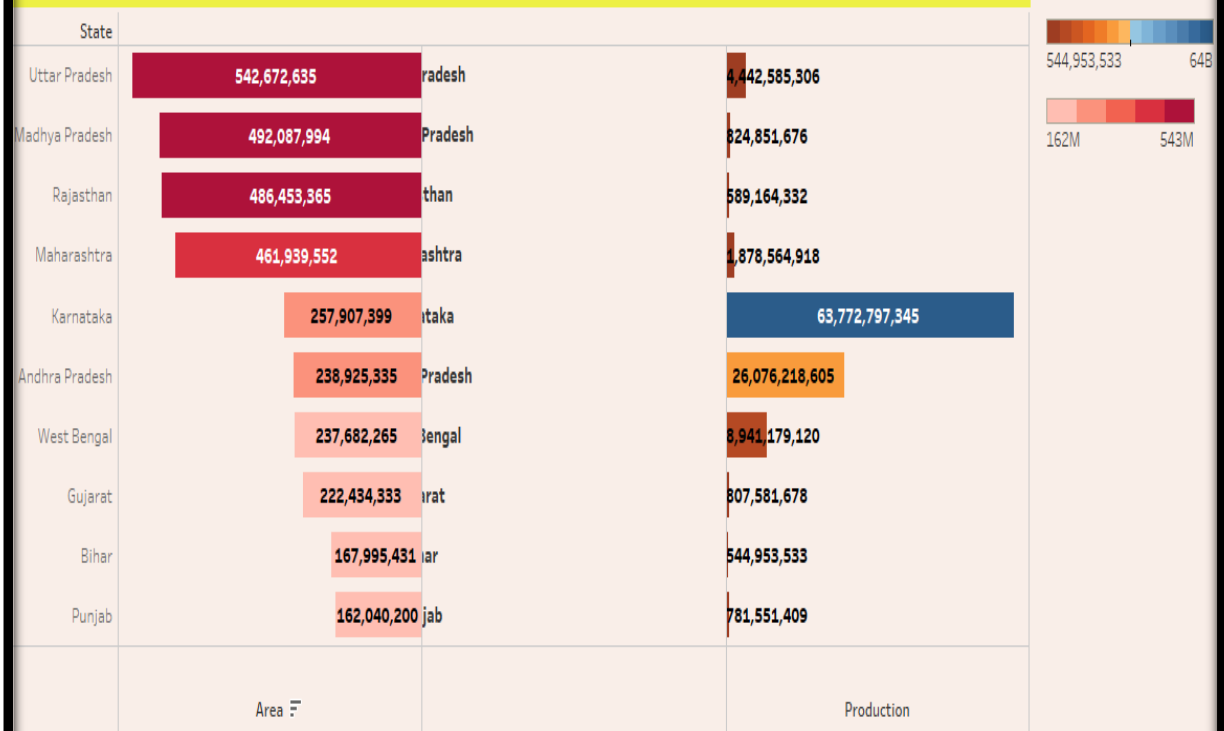# Area Vs Production

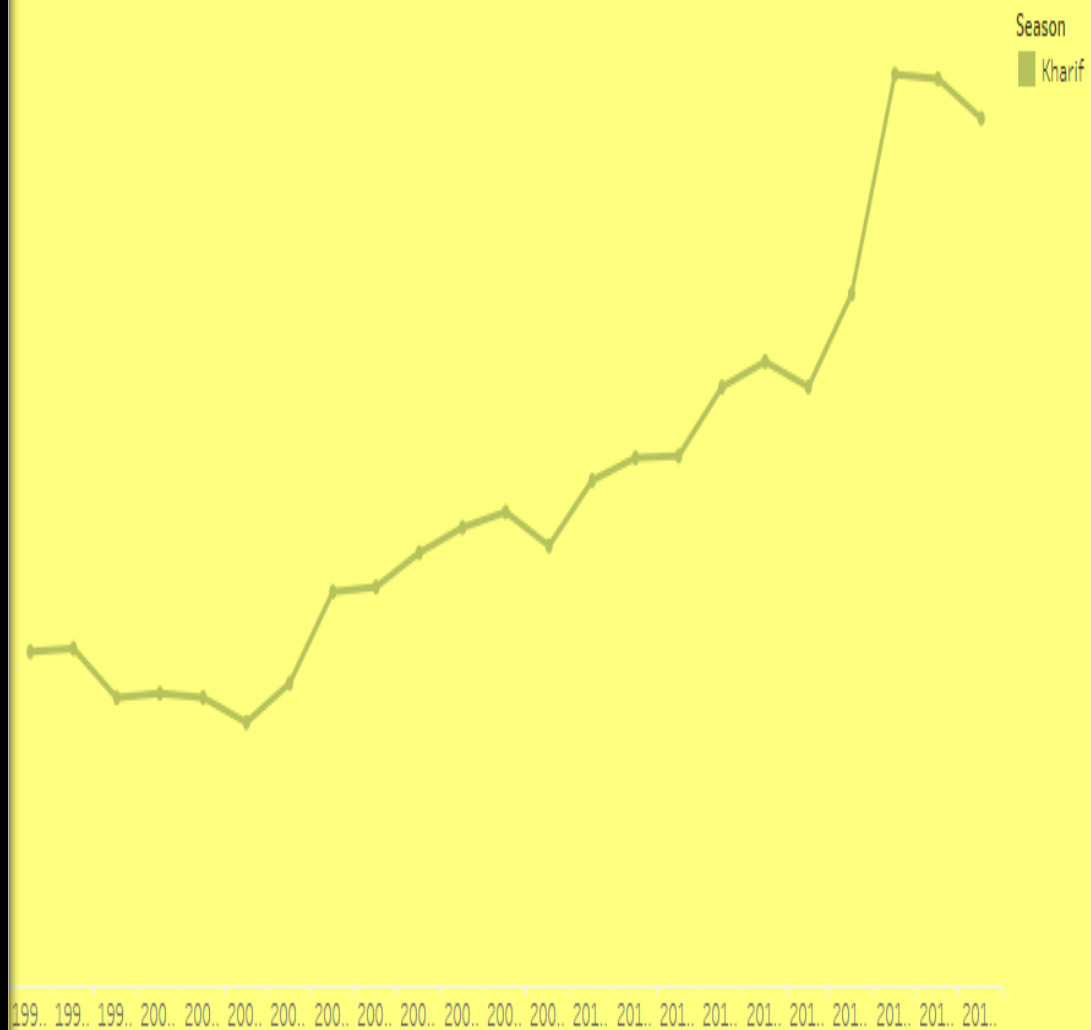| State	Area	Production
Uttar Pradesh	542,672,635	4,442,585,306
Madhya Pradesh	492,087,994	824,851,676
Rajasthan	486,453,365	589,164,332
Maharashtra	461,939,552	1,878,564,918
Karnataka	257,907,399	63,772,797,345
Andhra Pradesh	238,925,335	26,076,218,605
West Bengal	237,682,265	8,941,179,120
Gujarat	222,434,333	807,581,678
Bihar	167,995,431	544,953,533
Punjab	162,040,200	781,551,409

544,953,533   64B

162M   543M

Sum of Area, sum of Zero Line and sum of Production for each State. For pane Sum of Area: Color shows sum of Area. The marks are labeled by sum of Area. For pane Sum of Production: Color shows sum of Production. The marks are labeled by sum of Production. The view is filtered on State, which keeps 10 of 36 members.

Season Based Cultivation Area

Area

2   65,722,275

66.51%

Rice

5.18%

Bajra

0.24%

Banana

0.08%

Dry chillies

0.15%

Jowar

6.58%

Maize

0.34%

Onion

0.12%

Potato

0.20%
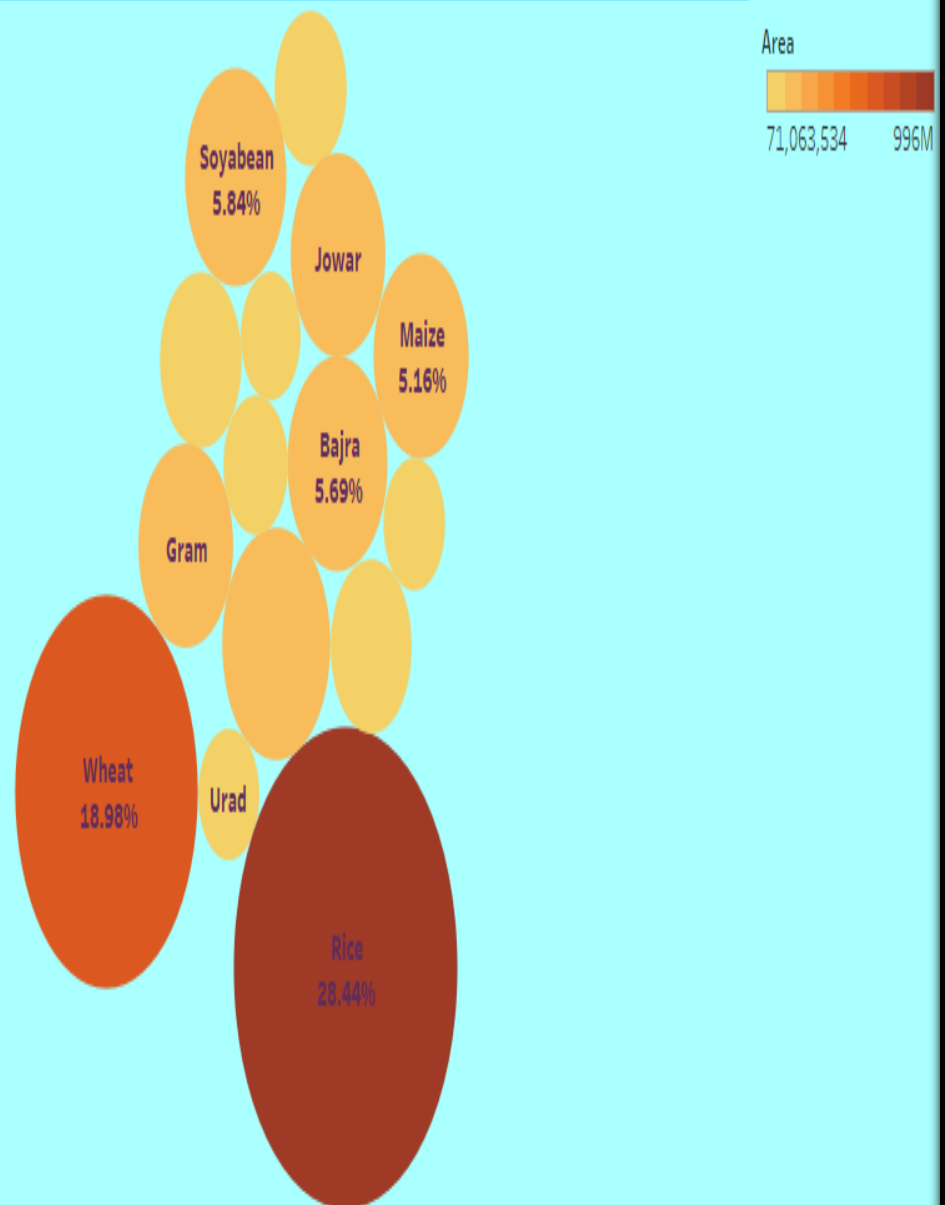
Ragi

3.56%

Sesamum

0.85%

Sunflower

1.24%

Urad

The trend of sum of Area for Crop. Color shows sum of Area. The marks are labeled by % of Total Area and Crop. The data is filtered on Season, which keeps Summer.

Yield by season

199.. 199.. 199.. 200.. 200.. 200.. 200.. 200.. 200.. 200.. 200.. 200.. 200.. 201.. 201.. 201.. 201.. 201.. 201.. 201.. 201.. 201.. 201..

The trend of sum of Yield for Year. Color shows details about Season. The view is filtered on Year and Season. The Year filter excludes 2020-21 and Null. The Season filter keeps Kharif.

Crop Plantation By Area

Area

71,063,534   996M

Soyabean
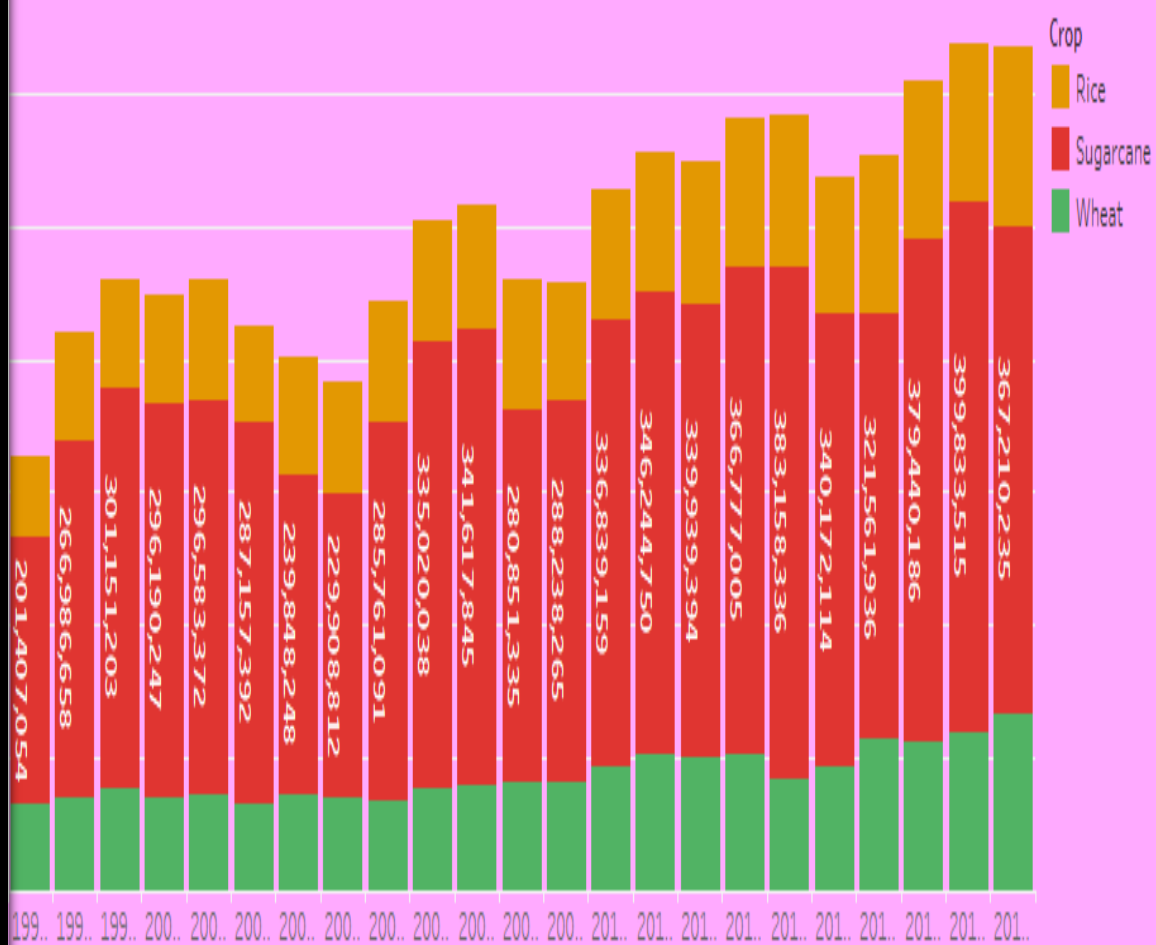5.84%

Jowar

Maize
5.16%

Bajra
5.69%

Gram

Wheat
18.98%

Urad

Rice
28.44%

Crop and % of Total Area. Color shows sum of Area. Size shows sum of Area. The marks are labeled by Crop and % of Total Area. The view is filtered on Crop, which has multiple members selected.

Major crop Growth yoy

Crop
- Rice
- Sugarcane
- Wheat

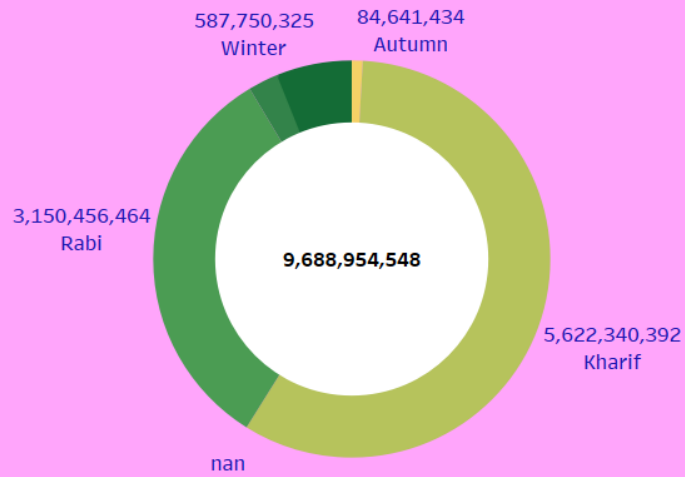| Year	Production
199..	201,407,054
199..	266,986,658
199..	301,151,203
200..	296,190,247
200..	296,583,372
200..	287,157,392
200..	239,848,248
200..	229,908,812
200..	285,761,091
200..	335,020,038
200..	341,617,845
200..	280,851,335
200..	288,238,265
201..	336,839,159
201..	346,244,750
201..	339,939,394
201..	366,777,005
201..	383,158,336
201..	340,172,114
201..	321,561,936
201..	379,440,186
201..	399,833,515
201..	367,210,235

Sum of Production for each Year. Color shows details about Crop. The marks are labeled by sum of Production. The view is filtered on Crop and Year. The Crop filter keeps Rice, Sugarcane and Wheat. The Year filter excludes 2020-21 and Null.

Crops(Plantation By count)

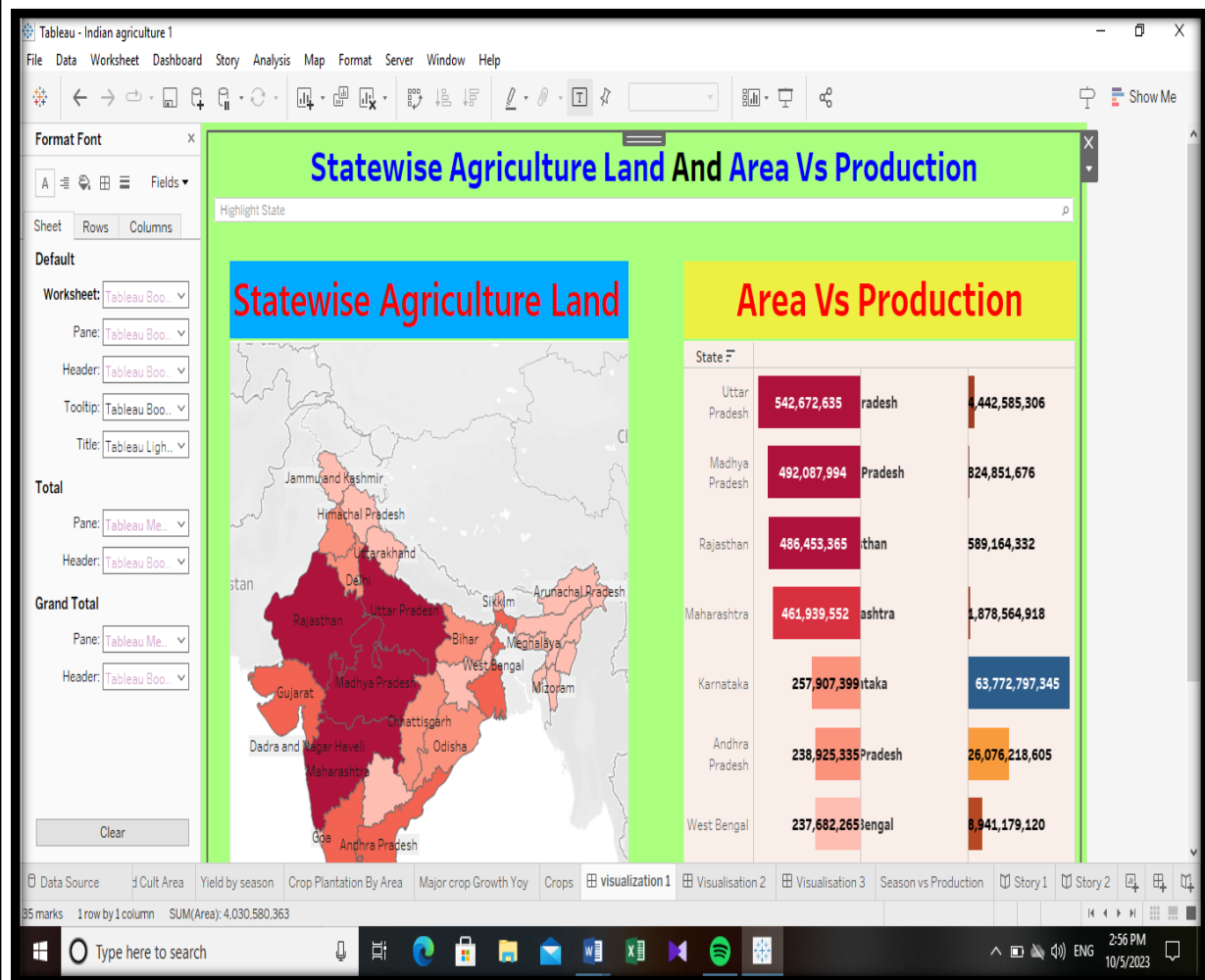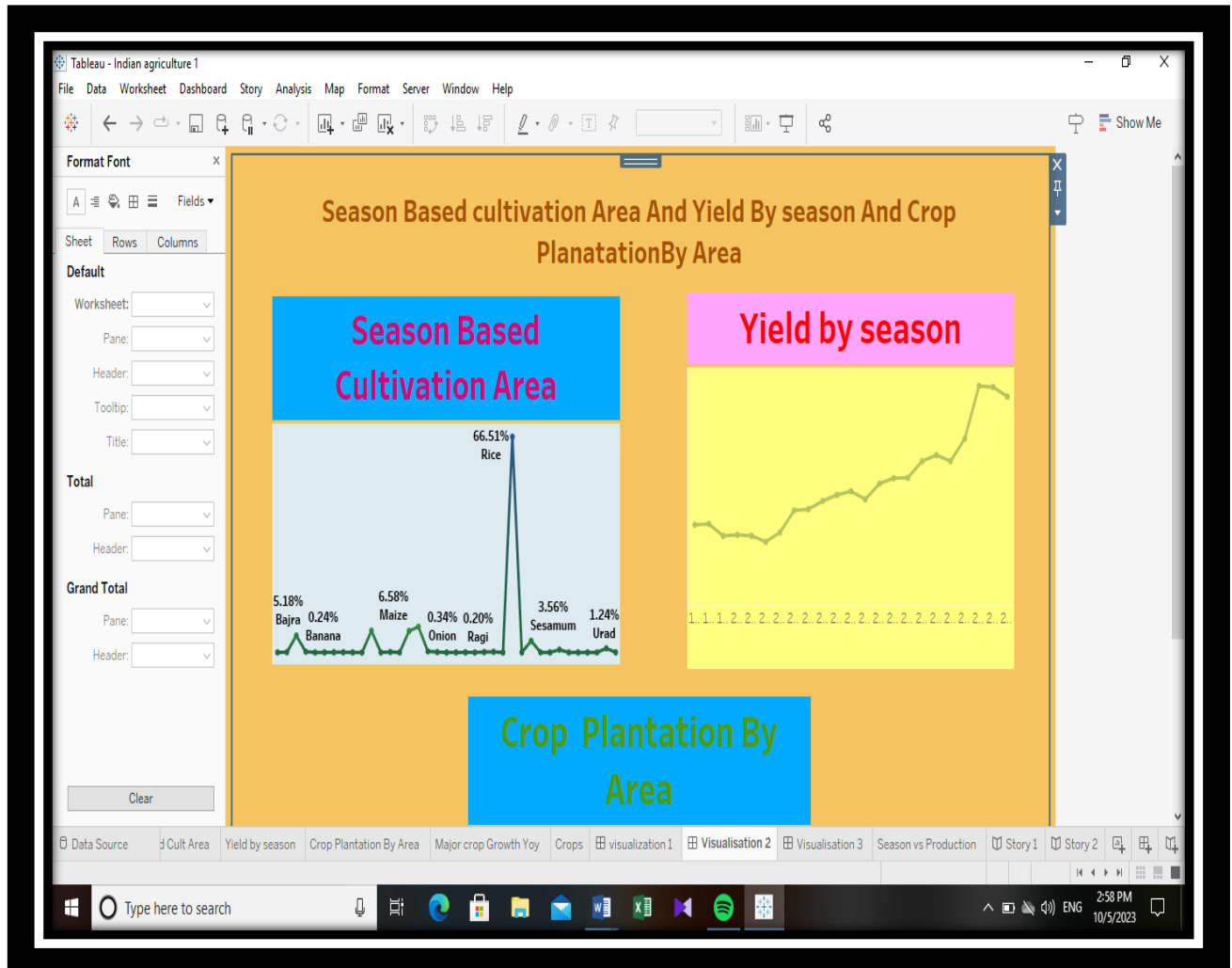Gram Rice Tapioca Potato Cowpea(Lobia) Cashewnut Safflower
Castor seed Ragi other oilseeds Arecanut Mesta Black pepper
Guar seed Cotton(lint) Linseed Turmeric Horse-gram Banana
Tobacco Maize Dry chillies Ginger Peas & beans (Pulses) Wheat
Dry Ginger
Sesamum Jute Moong(Green Gram) Masoor Other Kharif pulses
Moth Arhar/Tur Sugarcane Sweet potato Rapeseed &Mustard
Small millets Coconut Other Rabi pulses Urad Barley Groundnut Garlic
Khesari
Soyabean Coriander Sunflower Onion Sannhamp Bajra Other Cereals Other Summer Pulses
Oilseeds total Cardamom
Jowar Niger seed

Crop. Color shows details about Crop. Size shows count of Crop.

Crop
- Null
- Arecanut
- Arhar/Tur
- Bajra
- Banana
- Barley
- Black pepper
- Cardamom
- Cashewnut
- Castor seed
- Coconut
- Coriander
- Cotton(lint)
- Cowpea(Lobia)
- Dry chillies
- Dry Ginger
- Garlic
- Ginger
- Gram
- Groundnut
- Guar seed
- Horse-gram
- Jowar
- Jute
- Khesari
- Linseed
- Maize
- Masoor
- Mesta
- Moong(Green Gram)
- Moth
- Niger seed
- Oilseeds total
- Onion
- Other Cereals
- Other Kharif pulses
- other oilseeds
- Other Rabi pulses
- Other Summer Pulses
- Peas & beans (Pulses)
- Potato
- Ragi
- Rapeseed &Mustard
- Rice
- Safflower
- Sannhamp
- Sesamum
- Small millets
- Soyabean
- Sugarcane
- Sunflower
- Sweet potato
- Tapioca
- Tobacco
- Turmeric
- Urad
- Wheat

Season Vs Production

Season
- Autumn
- Kharif
- nan
- Rabi
- Summer
- Winter

587,750,325
Winter

84,641,434
Autumn

3,150,456,464
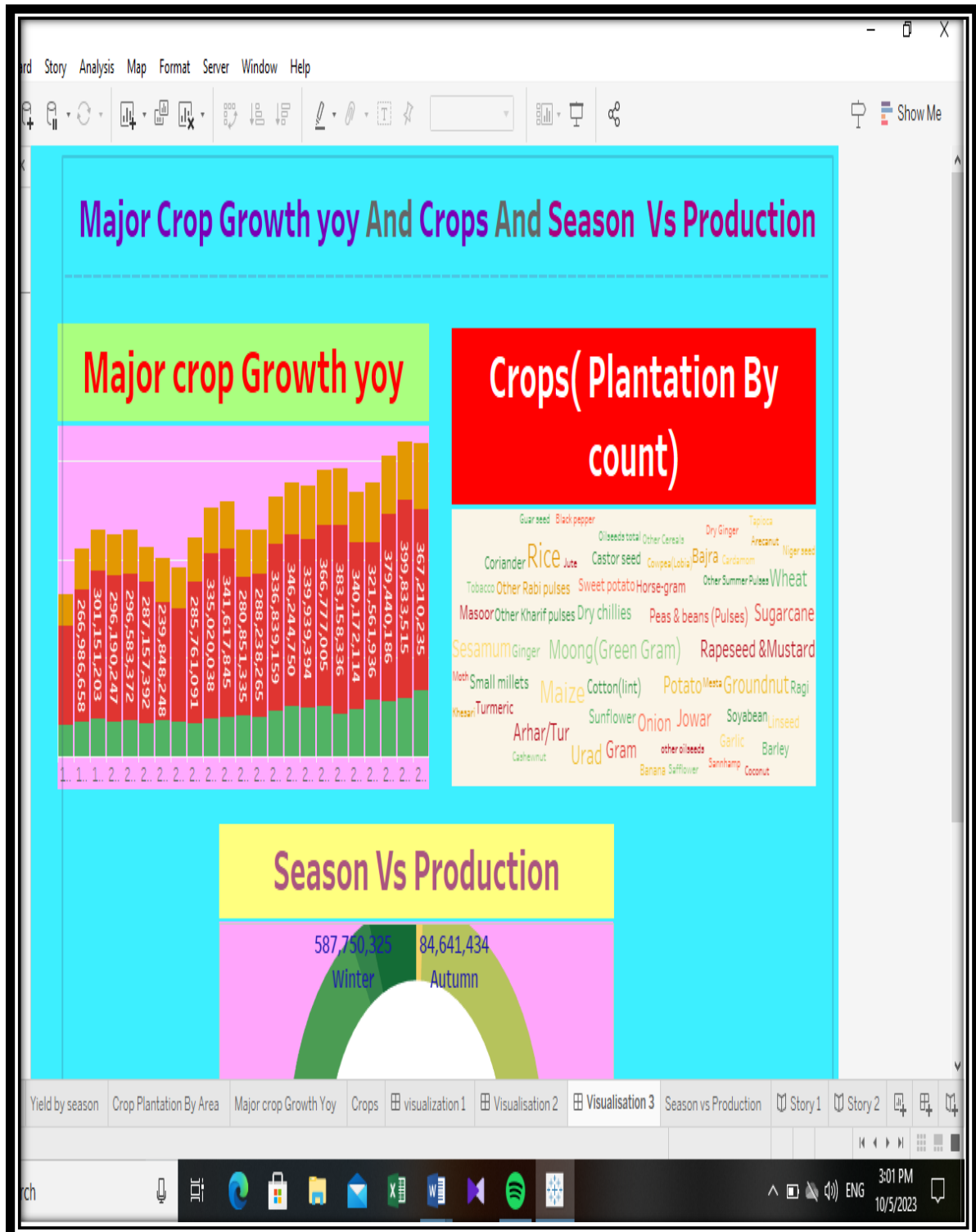Rabi

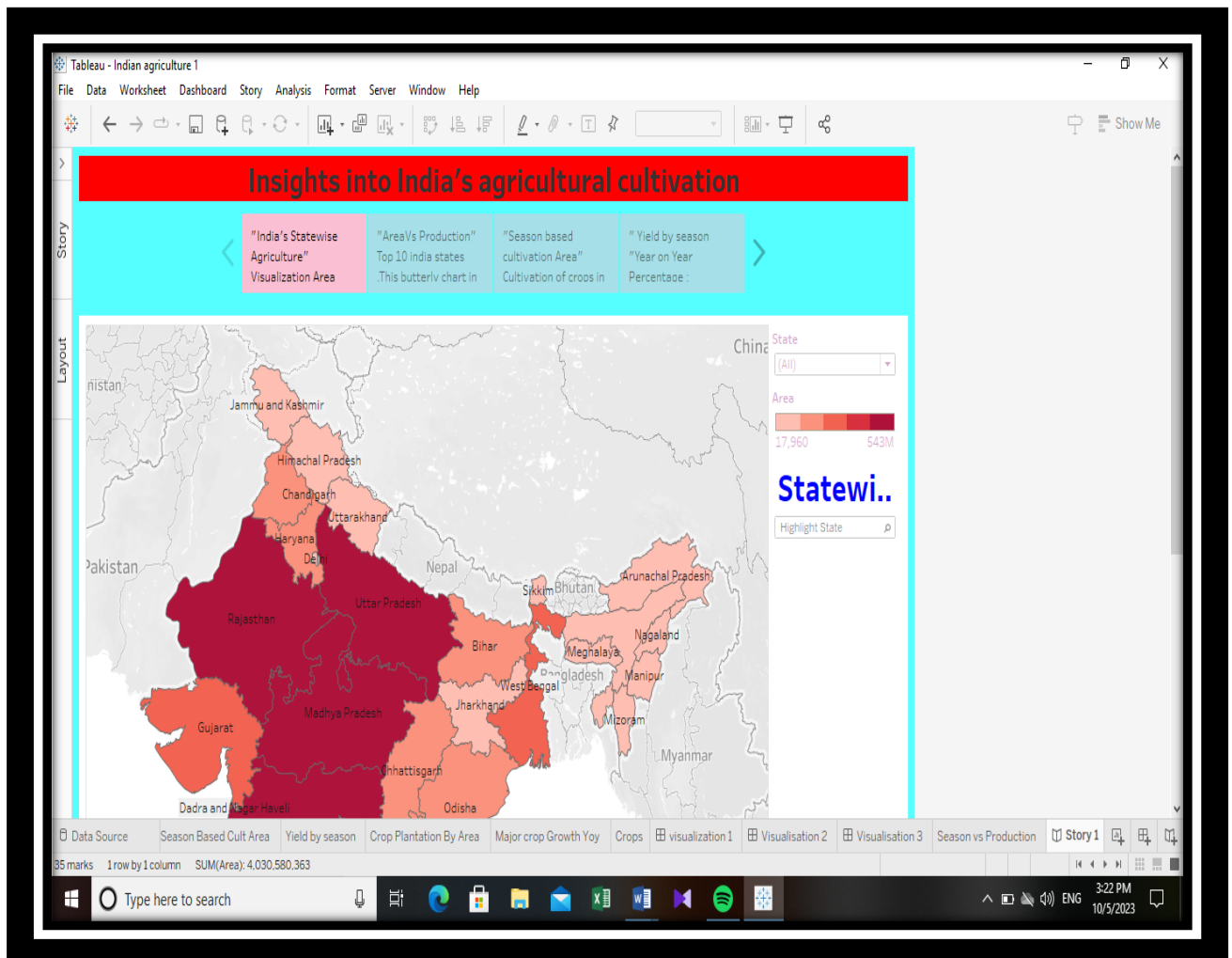9,688,954,548

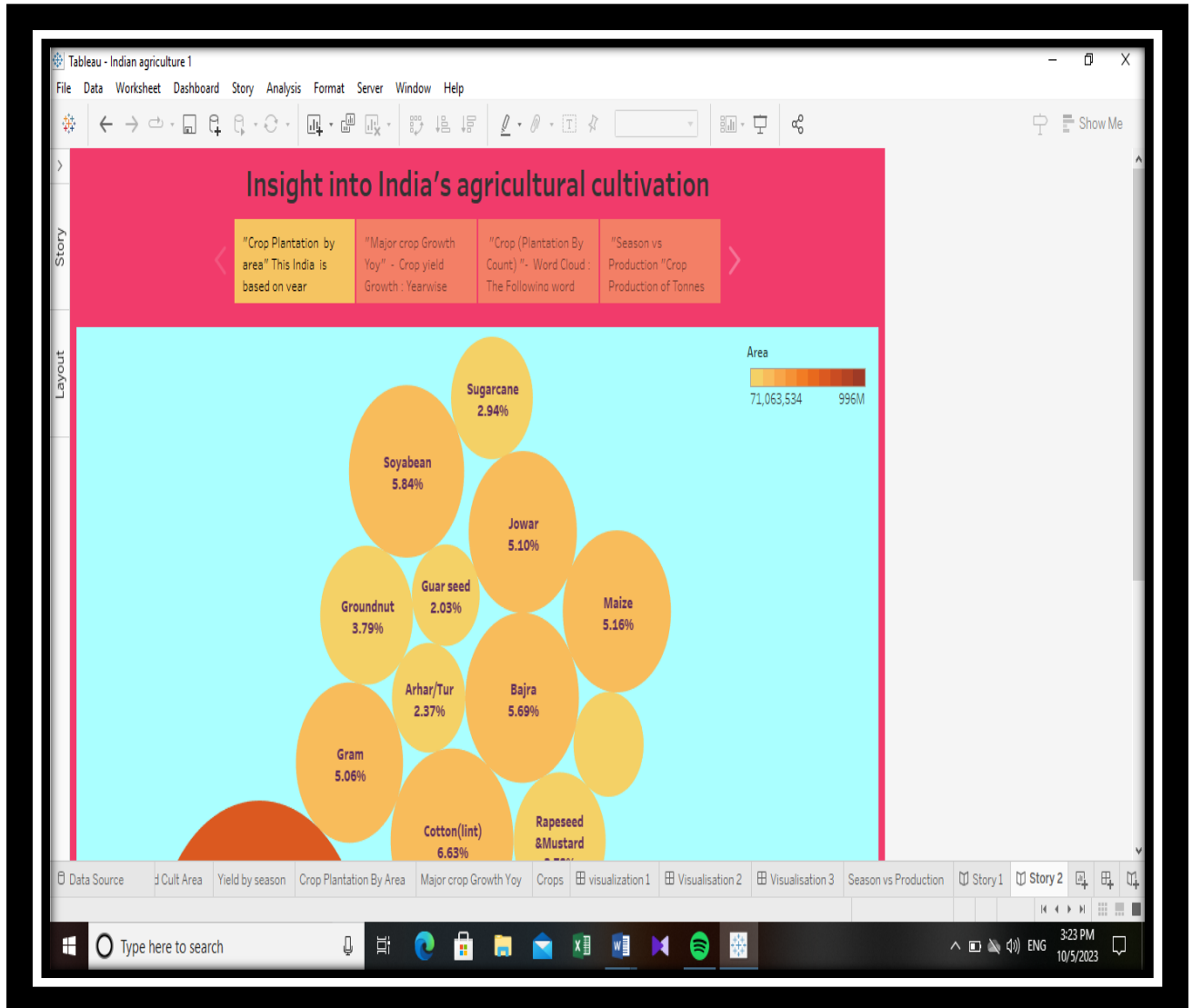5,622,340,392
Kharif

nan

Dashboard 1

Dashboard 2

Dashboard 3

Story 1

Story 2

4.Advantages and Disadvantages

Advantages

Boosting productivity and sustainability – Data collected from GPS-equipped tractors, soil sensors, and other external sources has helped in better management of seeds, pesticides, and fertilizers while increasing productivity to feed the ever-increasing global population.

Access to plant genome information – This has allowed the development of useful agronomic traits.

Predicting yields – Mathematical models and machine learning are used to collate and analyze data obtained from yield, chemicals, weather, and biomass index. The use of sensors for data collection reduces erroneous manual work and provides useful insights on yield prediction.

Risk management– Data-driven farming has mitigated crop failures arising due to changing weather patterns.

Food safety – Collection of data relating to temperature, humidity, and chemicals, lowers the risk of food spoilage by early detection of microbes and other contaminants.

Savings – data analytics-driven farming generate significant savings for the agriculture industry.

Disadvantages

- The generation of good-quality data is a critical concern in farm management information systems, and big real-time data does little to alleviate the problem.
- The strict application of data-ownership, privacy, and security issues impedes innovation.
- The large volume of unstructured and heterogeneous data demands domain experts and skilled data scientists.

- A successful business model calls for sustainable integration of data from all sources, which is often a Herculean task.
- The business models have to be such that they allow a fair share among the stakeholders.
- There is a challenge of developing affordable solutions for farmers in developing countries.

5.Applications

- ➢ Farmers shall predict the crop yield and increase their productivity and profit
- ➢ Various major crop yield connected with various factors used in supply chain management
- ➢ Farmer's policies can be revised on the quantity of yield

6.Conclusion

In concluding the key insights of the Project are

- ➢ Key crops by production over the years
- ➢ Relationship between area under production and production
- ➢ The magnitude of production
- ➢ Changes in crop production pattern over the years

Future Scope

- ➢ Modern technology usage helps to promote and sustainable growth in agriculture
- ➢ Major crops yield are identified by state wise and in turn escalate the crop yield

8.Appendix

Source code

https://public.tableau.com/views/Indianagriculture1/Story2?:language=en-GB&:display_count=n&:origin=viz_share_link