

# India's Agricultural Crop Production Analysis

(1997 - 2021)

This report delves into the captivating realm of India's agricultural cultivation, providing a comprehensive visual exploration of key aspects and trends in the agricultural sector. Through the visual representations, readers can gain valuable insights into crop production, seasonal variations, regional distribution, and overall production trends. These visualizations enable intuitive analysis, allowing stakeholders to uncover patterns, identify areas of growth or concern, and make data-driven decisions.

By harnessing the power of Tableau, this report not only presents the data in a visually appealing manner but also provides an interactive experience for readers to explore the intricacies of India's agricultural cultivation. To extract the insights from the data and put the data in the form of visualizations, Dashboards and Story we employed Tableau tool.

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## Project flow :

To accomplish this, we have to complete all the activities listed below.

### □ Define Problem / Problem Understanding

- Specify the business problem
- Business requirements
- Literature Survey
- Social or Business Impact.

### □ Data collection and Extraction from Database.

- Collect the dataset.
- Storing Data in DB
- Perform SQL Operations
- Connect DB with Tableau

### □ Data Preparation

- Prepare the Data for Visualization

### □ Data Visualization

- No of unique visualizations.

### □ Dashboard

- Responsive and Design of Dashboard

### □ Story

- No of scenes of story

### □ Performance Testing

- Amount of Data Rendered to DB.
- Utilization of Data filters

- No of calculation fields
  - No of visualizations / Graphs
- Web Integration
    - Dashboard and story embed with UI with flask.
  - Project Demonstration and Documentation
    - Record explanation video for project end-to-end solution.
    - Project Documentation - step-by-step project development procedure

## Milestone 1 : Define problem / Problem Understanding

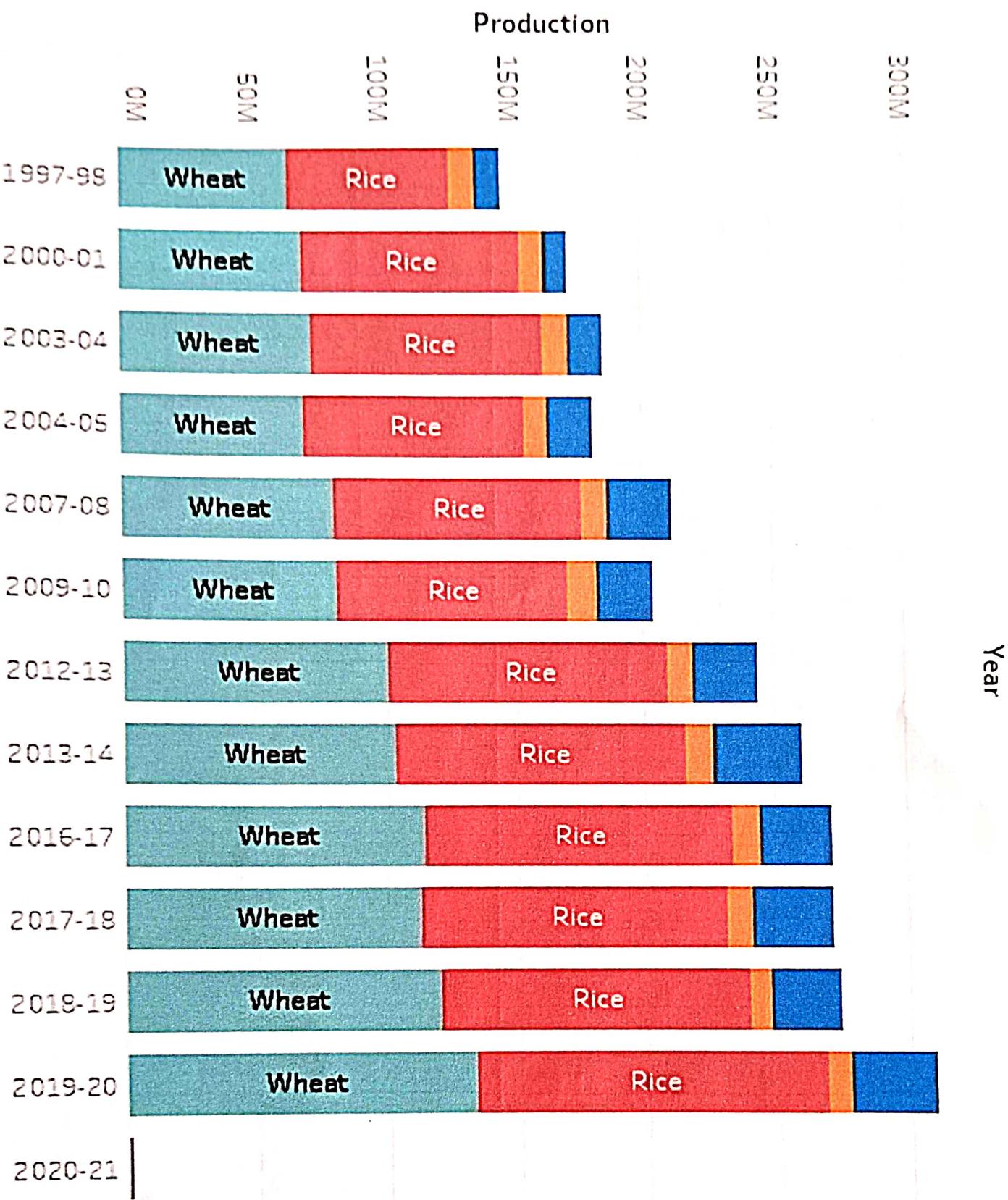
### Activity 1 : Specify the Business problem

This report delves into the captivating realm of India's agricultural cultivation, providing a comprehensive visual exploration of key aspects and trends in the agricultural sector. These visualizations enable intuitive analysis, allowing stakeholders to uncover patterns, identify areas of growth or concern, and make data-driven decisions. This report not only presents the data in a visually appealing manner but also provides an interactive experience for readers to explore the intricacies of India's agricultural cultivation.

### Activity 2 : Business requirements

The primary business requirements for this report are to visualize and analyze business expenses, provide industry-specific insights, identify cost drivers, highlight outliers, and offer interactive functionality. The report should facilitate the identification of key cost drivers, enabling stakeholders to understand the primary factors contributing to expenses. Additionally, it should flag any outliers or anomalies for further investigation. The report should provide a user-friendly and intuitive experience that empowers stakeholders to make data-driven decisions.

# MajorCropGrowthByYearOfield



## MAJOR CROP GROWTH PRODUCTION BY YEAR OF YIELD

In this visualization, represents amount of yield produced per years of major crop growth.

In x-axis, we take years (from 1997 to 2021), in y-axis we take production of major crops. (50 M per unit)

Here the major crops are Wheat, Rice, Jute, Cotton (Lint) from the year 1997 to 2021, the major crops are wheat and rice. For every year those are increasing. At the year 2019 to 2020 the production of wheat and rice are more.

### Activity 3 : Literature Survey

The literature survey section of the report provides a concise overview of India's agricultural sector, focusing on key aspects and insights from existing studies and publications. It highlights the role of government policies and initiatives in supporting the sector's growth and development.

The survey explores the diversity of crops cultivated across different regions, along with trends in production and the impact of climate variability.

Additionally, the section showcases best practices and success stories that have contributed to improved productivity and sustainability in Indian agriculture.

### Activity 4 : Social or Business Impact.

**Social Impact:** On social front, agriculture serves as a vital source of livelihood for a large portion of the population, especially in rural areas. Moreover, agricultural activities contribute to the overall socio-economic development of rural communities, fostering social cohesion and preserving cultural traditions.

**Business Impact:** From a business perspective, the agricultural sector plays a pivotal role in India's economy.

It contributes to the country's GDP and serves as a source of raw materials for various industries, such as food processing, textile, and pharmaceuticals. Furthermore, advancements in agricultural practices and technology have the potential to enhance productivity, optimize resource utilization, and promote sustainable practices. This, in turn, can lead to increased profitability and competitiveness for agricultural businesses.

## Milestone 2 : Data collection and Extraction from Database

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypothesis, evaluate outcomes and generate insights from the data.

### Activity 1 : Downloading the dataset

Please follow the link to download :

<https://www.kaggle.com/datasets/pyabakov/indian-agriculture-Crop-production>

### Activity 1.1 : Understand the data

Data consists of 345409 rows and 10 columns that correspond to different values.

Column description of the Dataset :

State : The name of the Indian states.

District : The name of the districts of Indian states,

Crop : Name of different crops grown in India

Year : Date

Season : India has 5 seasons for crop cultivation Kharif, Rabi, autumn, winter and summer.

Area : Area for crop cultivation in acres.

Production : Production of crops in tonnes.

Yield : Yield by the crops under cultivation.

Activity 2 : Storing data in DB and perform SQL operations

Explanation video link :

<https://drive.google.com/file/d/1iQ7ywnjxIR4HPOTagRMG1qzpcugAEvLZ-y/view?usp=sharing>

Activity 3 : Connect DB with Tableau

Explanation video link :

<https://drive.google.com/file/d/1iQ7ywnjxIR4HPOTagRMG1qzpcugAEvLZ-y/view?usp=sharing>

Milestone 3 : Data Preparation

Activity 1 : Prepare the data for visualization

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the

data is accurate and complete.

<https://drive.google.com/drive/folders/1p0P1zANkHZFPWk4iy81y0SF2H10m2hxs?usp=sharing>

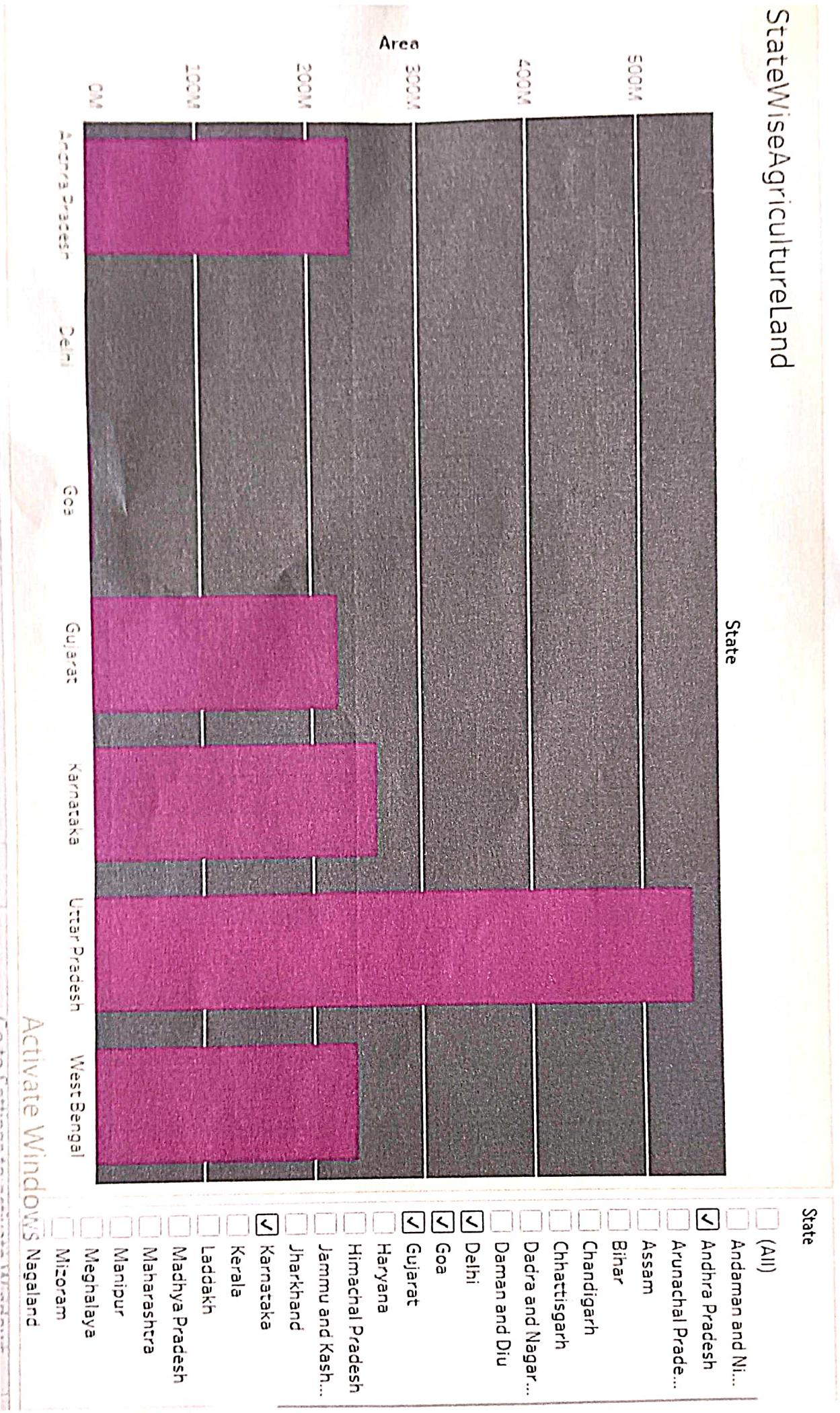
#### Milestone 4 : Data Visualization

Data visualization is the process of creating graphical representations of data to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret.

##### Activity 1 : No of unique visualizations

-the number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyse the performance of banks include bar charts, line charts, heat maps, scatter plots, pie charts, maps etc.

## StateWiseAgricultureLand



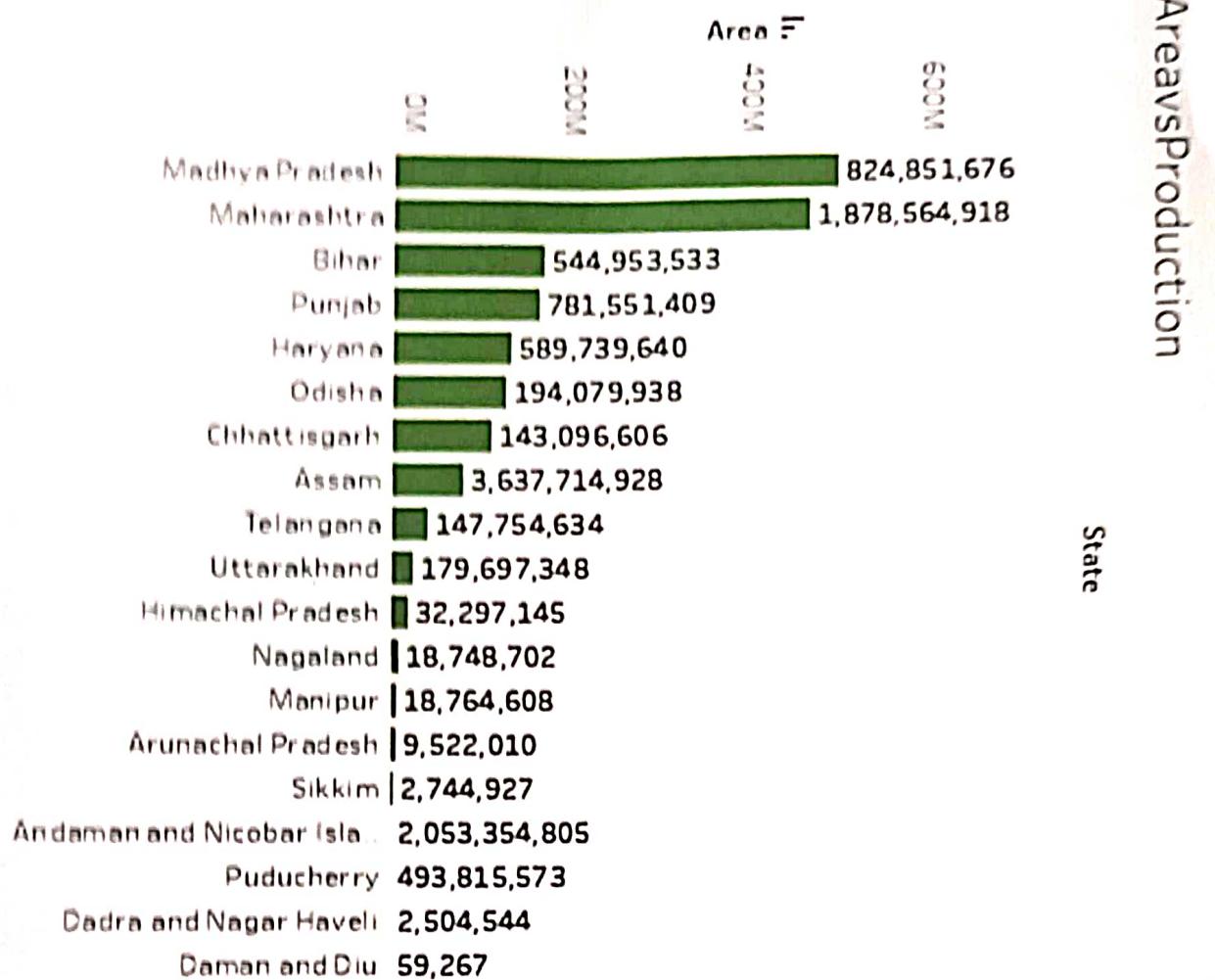
## STATE WISE AGRICULTURAL LAND

The graph represents - the how much amount of agricultural land present in each state.

In y-axis, we take amount of area (100M per unit) and in x-axis we take states per unit.

In the graph we selected only ~~six~~ seven states i.e., Andhra Pradesh, Delhi, Goa, Gujarat, Karnataka, ~~Uttar~~ Pradesh and West Bengal. Here Uttar Pradesh has more amount of Agricultural land and Delhi has less amount of Agricultural land. So in Uttar Pradesh has more income and less health issues. Andhra Pradesh, Gujarat, Karnataka and West Bengal has average amount of agricultural land.

## Area vs Production



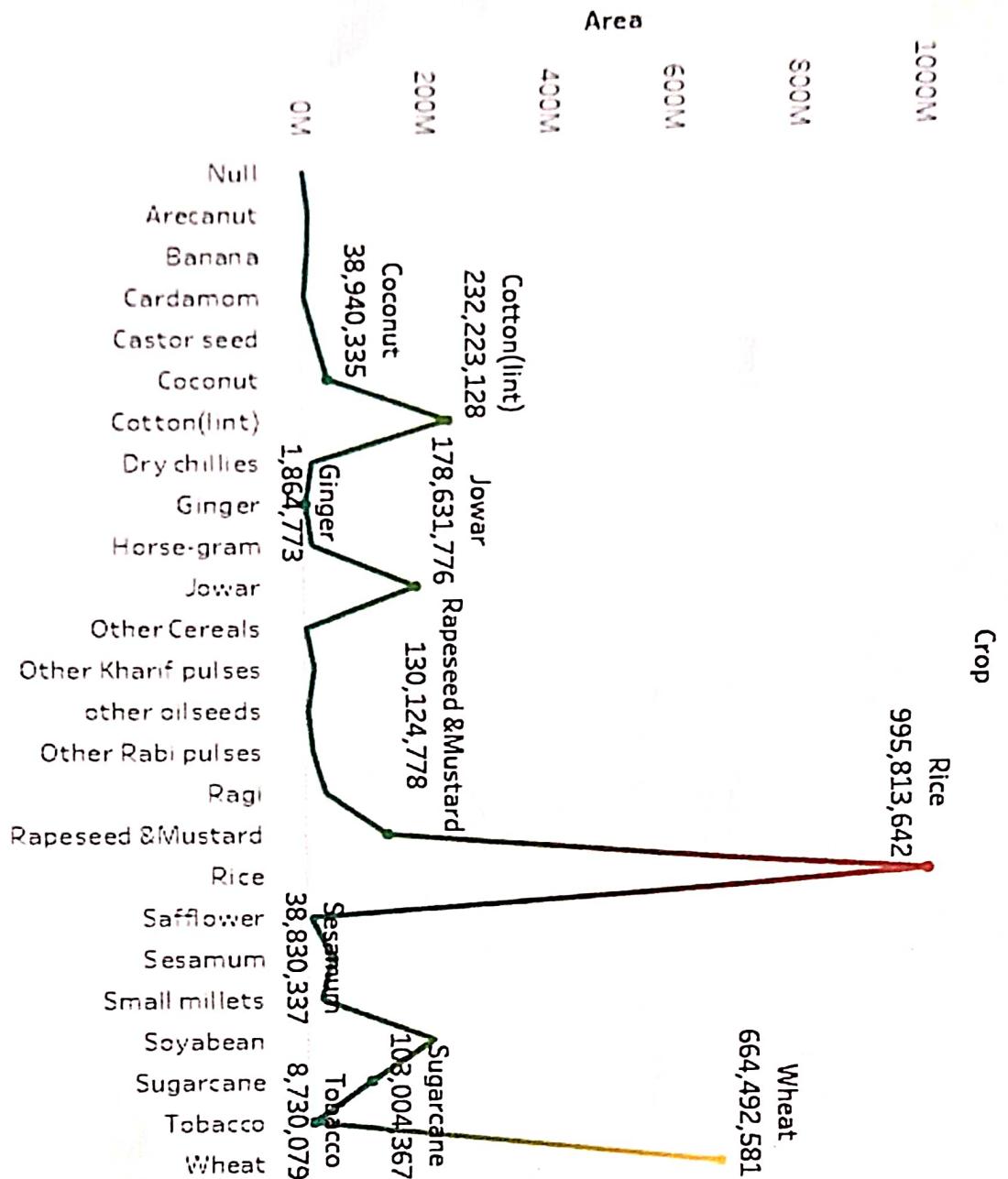
Activate Windows

State	(All)
<input type="checkbox"/> Andaman and Nicobar Islands	
<input type="checkbox"/> Andhra Pradesh	
<input type="checkbox"/> Arunachal Pradesh	
<input type="checkbox"/> Assam	
<input checked="" type="checkbox"/> Bihar	
<input type="checkbox"/> Chandigarh	
<input type="checkbox"/> Chhattisgarh	
<input type="checkbox"/> Dadra and Nagar Haveli	
<input type="checkbox"/> Daman and Diu	
<input type="checkbox"/> Delhi	
<input type="checkbox"/> Goa	
<input type="checkbox"/> Gujarat	
<input checked="" type="checkbox"/> Haryana	
<input checked="" type="checkbox"/> Himachal Pradesh	
<input type="checkbox"/> Jammu and Kashmir	
<input type="checkbox"/> Jharkhand	
<input type="checkbox"/> Karnataka	
<input type="checkbox"/> Kerala	
<input type="checkbox"/> Ladakh	
<input checked="" type="checkbox"/> Madhya Pradesh	
<input checked="" type="checkbox"/> Maharashtra	

SUM(Area)

273 542,672,63

## SeasonBaseCultivation



Crop

(All)

Null

Arecanut

Arhar/Tur

Bajra

Barley

Black pepper

Cardamom

Cashewnut

Castor seed

Coconut

Coriander

Cotton(lint)

Cowpea(Lobia)

Dry chillies

Dry Ginger

Garlic

Ginger

Gram

Groundnut

Guar seed

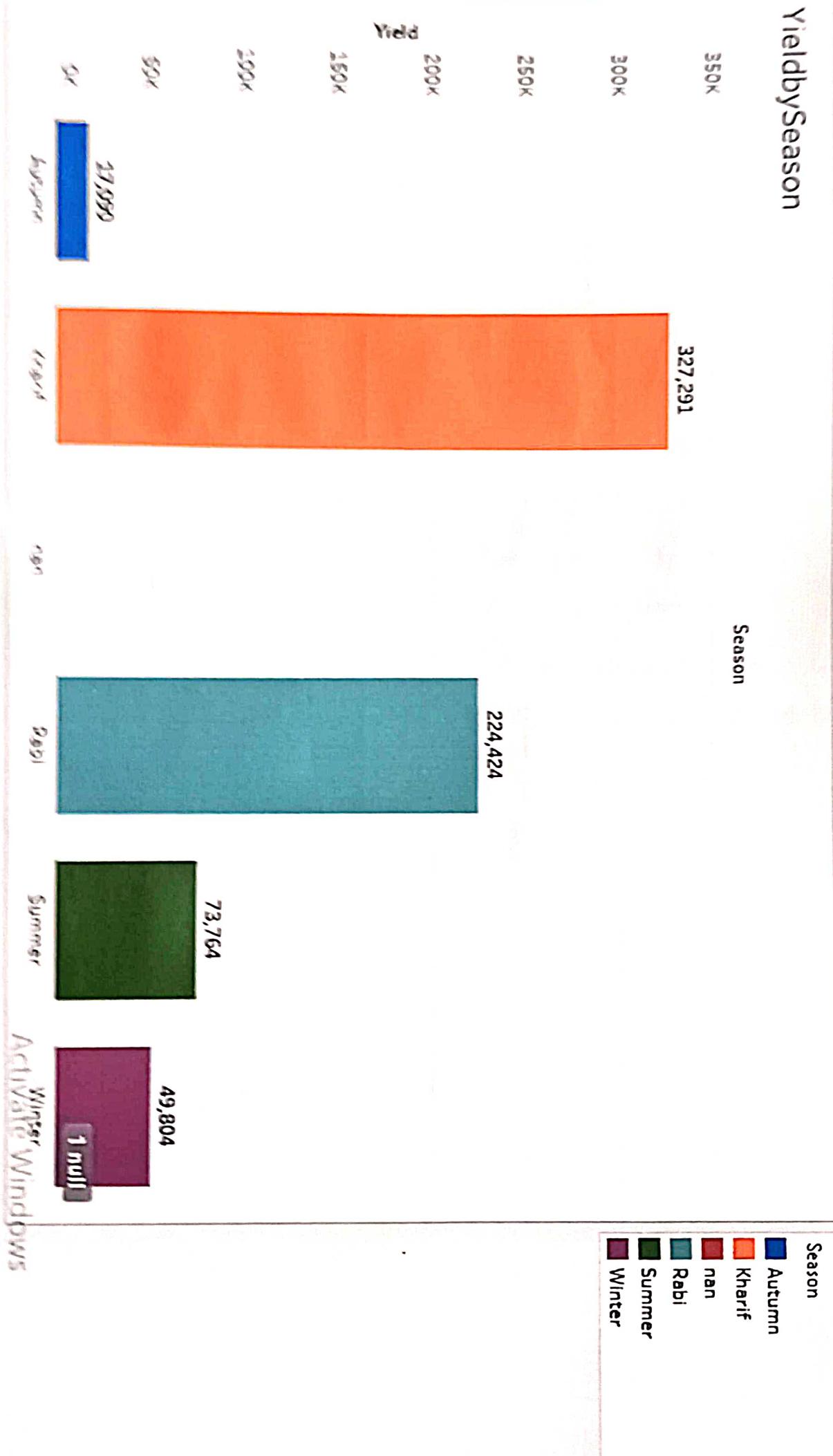
SUM(Area)

1,308,206

995,813,642

Activate W

## Yield by Season



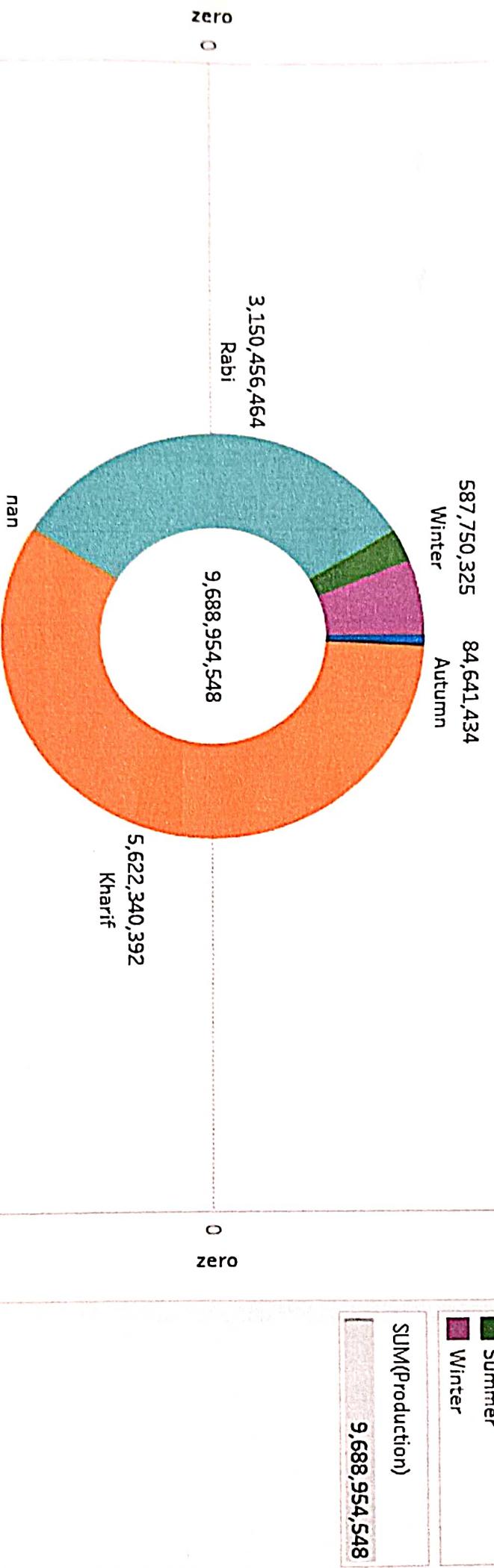
## YIELD BY SEASON

The graph represents the how much amount yield is produced in different seasons. In x-axis we take seasons per month. unit and in y-axis amount of yield produced (50k per one unit).

In the graph, we selected the seasons Autumn, Karif, Nan, Rabi, Summer, Winter.

In the season Karif has more amount of yield (327791) and Nan has 0 yield production. Summer, winter and Autumn below average amount of yield. Rabi season has average amount of yield (2924424). So by this we can say amount of yield production by season.

## SeasonWiseProduction



Activate Windows

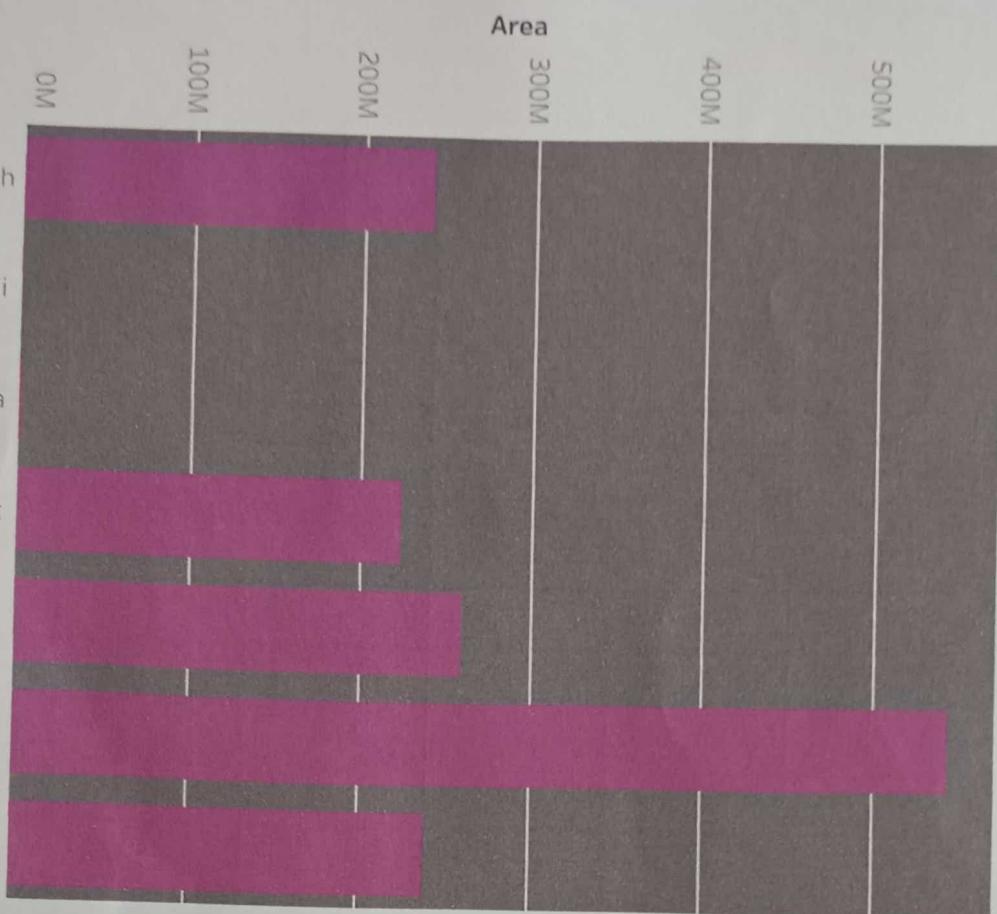
## Milestone 5 : Dashboard

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs and tables.

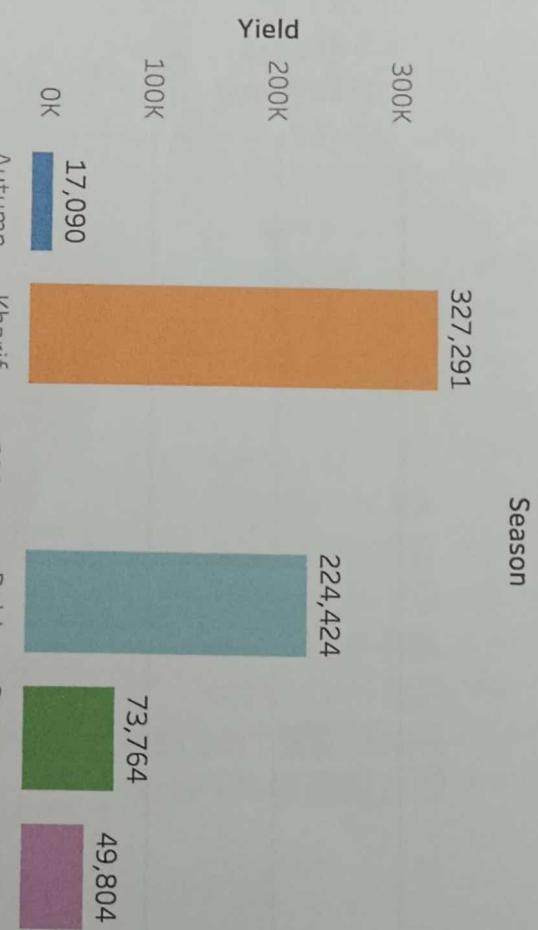
### Activity 1 : Responsive and Design of dashboard

Once you have created views on different sheets in Tableau, you can pull them into a dashboard.

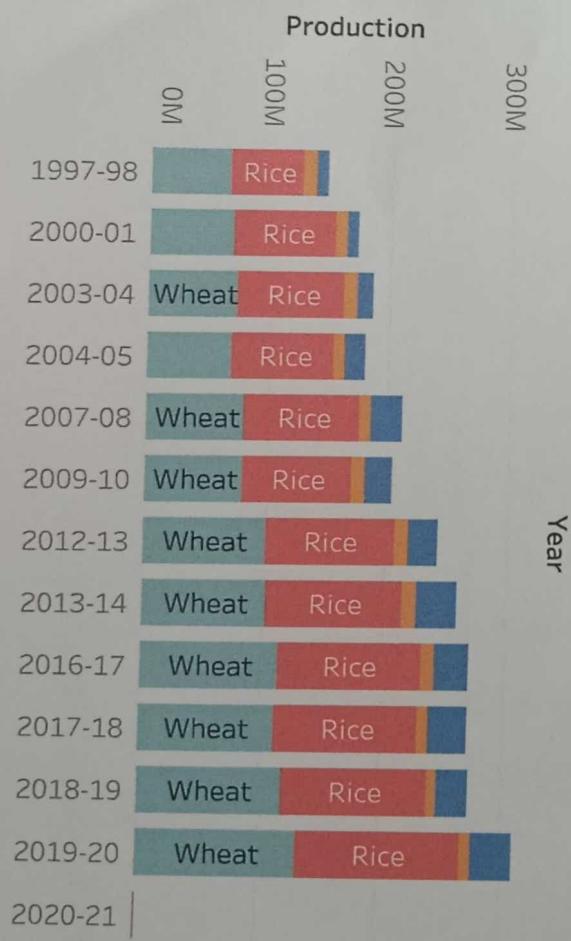
## StateWiseAgricultureLand



## YieldbySeason



## MajorCropGrowthByYearOfield



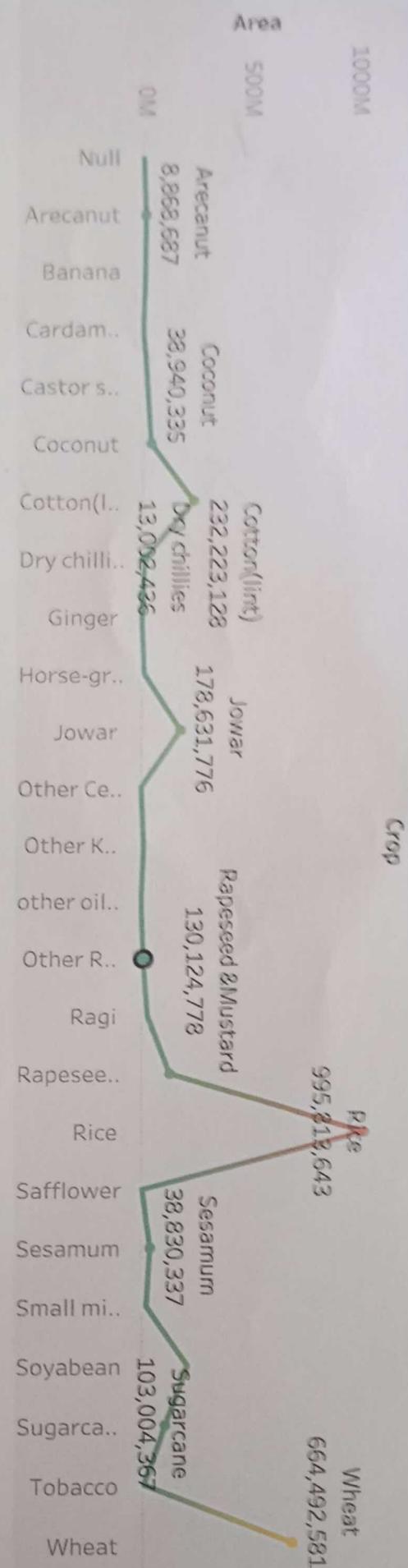
## DASH BOARD - 2

State wise agricultural land : In this visualizations we came to known about different states which consists of different areas. And in this we have learnt that different lands grow different crops. Some of the states are Andhra Pradesh, Delhi, Goa, Gujarat etc. According to the land the seeds and the crops are grown in the particular field.

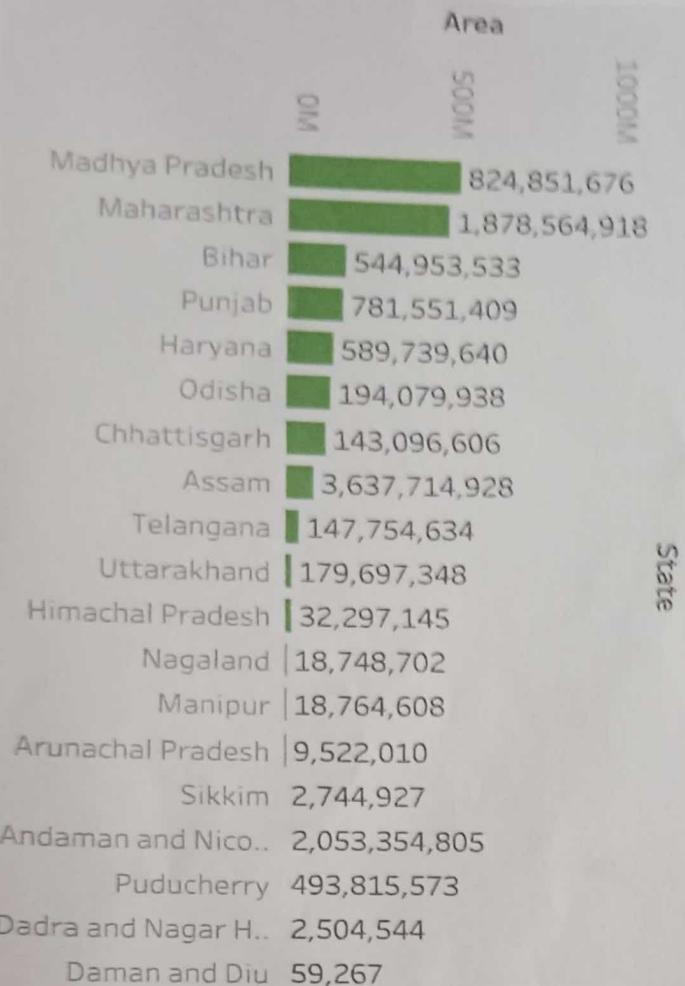
Yield by season : According to the seasons the crops are yield. Some of them are autumn, Kharif, summer, Rabi, winter etc.

Major crops growth by year of field : In this visualization the data consists of production. The production is calculated as per years. Wheat and Rice are taken as the product and compare every year.

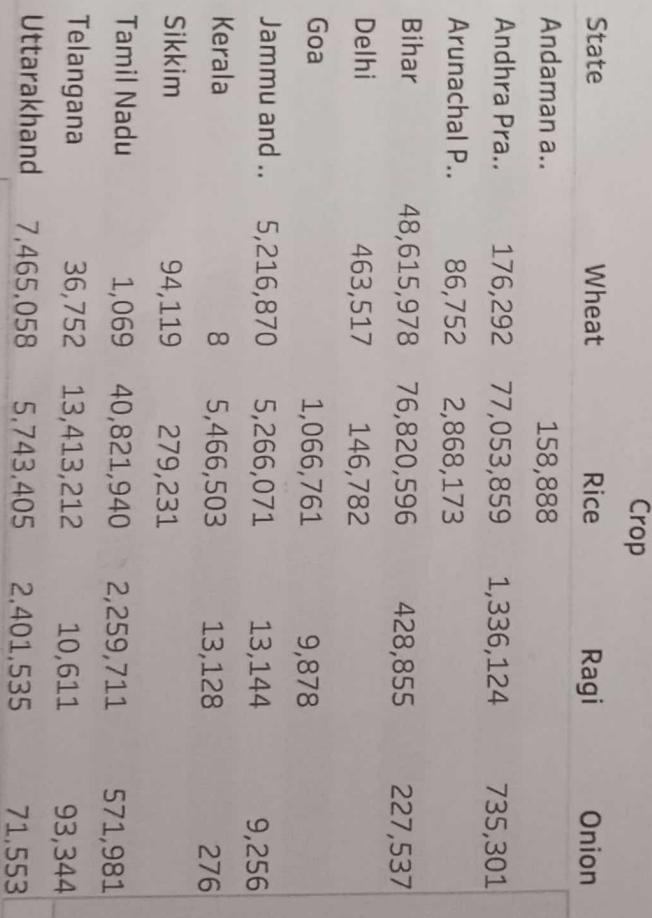
## SeasonBaseCultivation



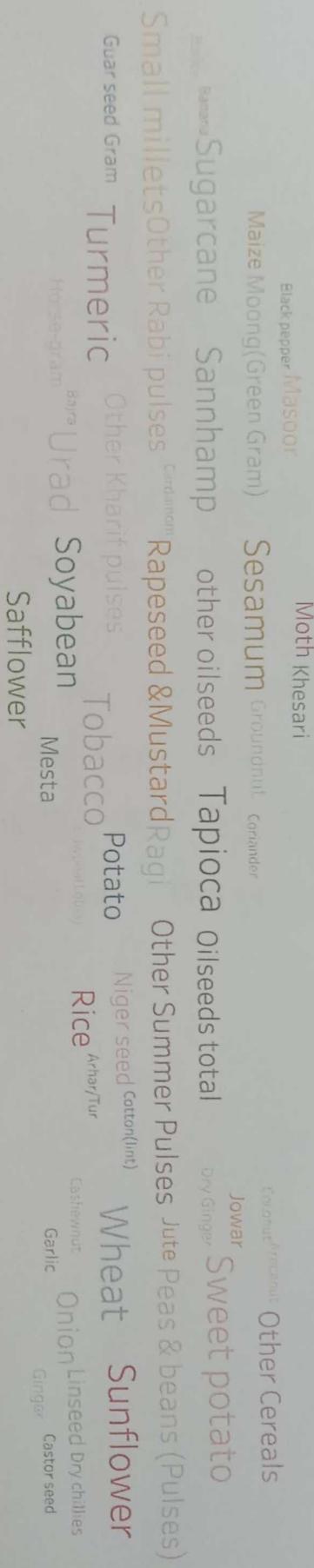
## AreavsProduction



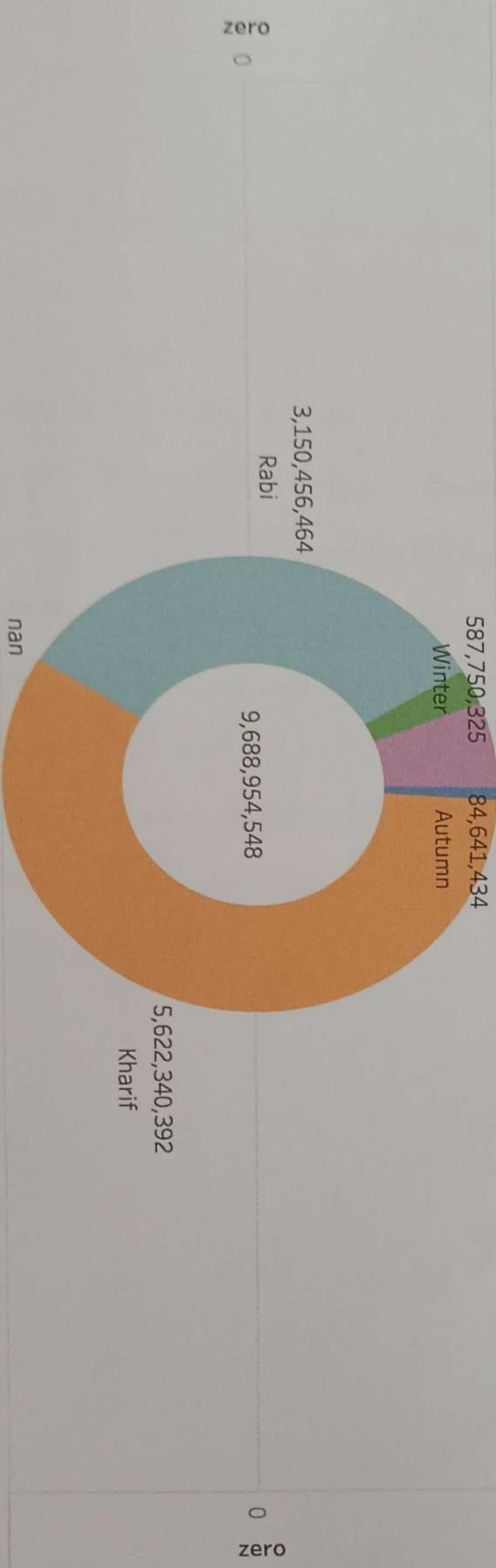
## CropPlantationByArea



## Crops



## SeasonWiseProduction



## DASH BOARD 1

Crops: There are different types of crops. According to this data we get to know about different types of seeds and pulses etc. Some of the crops are sugarcane, turmeric, soyabean, summer pulses, wheat etc and we also know about crops of some vegetables like onion, garlic, ginger etc. With these visualizations we came to know about grams, flowers etc. like sunflower, sweet potato, dry chillies, lin seed etc. And we also have tobacco, crop and other kairi pulses. And we also learnt so many different things. With this dash board we came to know about unknown crops which are existing.

## Milestone 6: Story

A data story is a way of presenting data and analysis in a narrative format, intending to make the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data. Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

### Activity 1 : Number of scenes in a story.

The number of scenes in a storyboard for a data visualization analysis of the performance of banks will depend on the complexity of the analysis and the specific insights that are trying to be conveyed.

## Crop Plantation By Area

State	Crop					
	Wheat	Rice	Ragi	Onion	Coconut	Banana
Andaman and Nicobar Isl...	158,888	77,053,859	1,336,124	735,301	1,965,574	33,773
Andhra Pradesh	176,292	2,868,173				997,095
Arunachal Pradesh	86,752					
Bihar	48,615,978	76,820,596	428,855	227,537		162,341
Delhi	463,517	146,782				
Goa	1,066,761	9,878				29,097
Jammu and Kashmir	5,216,870	5,266,071	13,144	9,256		
Kerala	8	5,466,503	13,128	276	19,221,996	1,217,461
Sikkim	94,119	279,231				
Tamil Nadu	1,069	40,821,940	2,259,711	571,981	6,434,950	1,740,727
Telangana	36,752	13,413,212	10,611	93,344	867	11,469
Uttarakhand	7,465,058	5,743,405	2,401,535	71,553		
West Bengal	7,582,418	129,455,241	245,970			643,681

## Crops

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

## Milestone 7 : Performance Testing

### Activity 1 : Amount of data rendered to DB

- The amount of data that is rendered to a database depends on the size of the dataset and the capacity of the database to store the retrieved data.
- Open the MySQL Workbench, go to the database then click to expand the tables, select the table and click on (i) button to get the information related to table such as column count, table rows etc.

#### SCHEMAS

Q FILTER OBJECTS

- ▷ adarsh
- ▷ agri
- ▽ agriculture
  - ▷ Tables
    - ▷ Combined
    - ▷ india
  - ▷ Views
  - ▷ stored procedures
  - ▷ functions
- ▷ airport\_data
- ▷ business
- ▷ sakila
- ▷ student
- ▷ usys

### Activity 3 : Number of visualizations

- (1) Statewise Agricultural land
- (2) Area vs Production
- (3) Season based cultivation by area
- (4) Yield by season
- (5) Crop plantation by area
- (6) Major crops growth Yoy
- (7) Crops plantation by count
- (8) Season wise production.

### Milestone 8 : Web Integration

Publishing helps us to track and monitor key performance metrics and to communicate results and progress. help a publisher stay informed, make better decisions, and communicate their performance to others.

Activity 1 : Publishing dashboard and reports to tableau public.

<https://drive.google.com/file/d/1Dcxffd5J5I4h5B07nTpsy60j7g1E-kpY/view?usp=drivesdk>

Activity 2 : Embed dashboard and story with bootstrap

<https://drive.google.com/file/d/17zJzSAi8bEiVgoGk4wgJCWTdRtdolTuz/view?usp=drivesdk>