Report:
Crop Production Analysis in India

Introduction

Crop production is a critical aspect of agriculture, involving the cultivation of plants for food, fiber, medicinal purposes, and other uses. The primary goal is to produce a sufficient quantity and quality of crops to meet the needs of a population.

India is one of the world's leading agricultural countries, with a diverse climate that allows for the cultivation of a wide variety of crops. Agriculture is a significant part of India's economy, employing a large portion of the population and contributing to GDP.

Overview of the Data

	State_Name	District_Name	Crop_Year	Season	Crop	Area	Production
0	Andaman and Nicobar Islands	NICOBARS	2000	Kharif	Arecanut	1254.0	2000.0
1	Andaman and Nicobar Islands	NICOBARS	2000	Kharif	Other Kharif pulses	2.0	1.0
2	Andaman and Nicobar Islands	NICOBARS	2000	Kharif	Rice	102.0	321.0
3	Andaman and Nicobar Islands	NICOBARS	2000	Whole Year	Banana	176.0	641.0
4	Andaman and Nicobar Islands	NICOBARS	2000	Whole Year	Cashewnut	720.0	165.0

DATA DICTIONARY

Serial No.	Column Name	Explanation
1	State_Name	Name of the Indian state where the crop was produced.
2	District_Name	Name of the district within the state where the crop was produced.
3	Crop_Year	Numerical year the crop was harvested.
4	Season	The planting season.
5	Crop	Type of crop grown.
6	Area	The area planted with the crop.
7	Production	Quantity of the crop harvested.

General Statistics of the Data

```python
#Total Number of States
print(f"The data includes {crop['State_Name'].nunique()} Indian States.")
```

```
The data includes 33 Indian States.
```

```python
#Number of Districts
print(f"The data includes {crop['District_Name'].nunique()} Indian Districts.")
```

```
The data includes 646 Indian Districts.
```

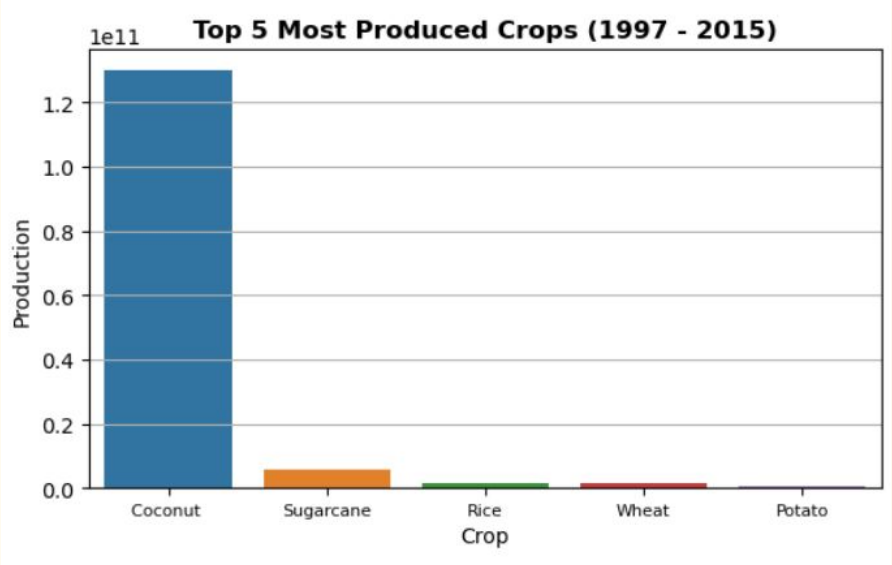
```python
#Range in years
min=crop['Crop_Year'].min()
max=crop['Crop_Year'].max()
print(f"The data spans from {min} through {max}, covering a period of {max-min} years.")
```

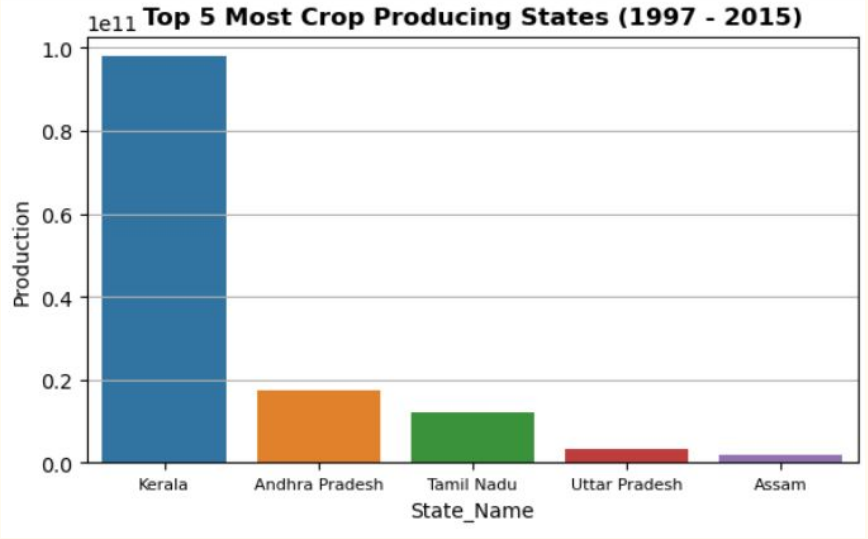
```
The data spans from 1997 through 2015, covering a period of 18 years.
```

```python
#Crop seasons included in the data
print("The data includes the following seasons:")
count=1
for i in crop['Season'].unique():
    print(f"{count}. {i}")
    count+=1
```

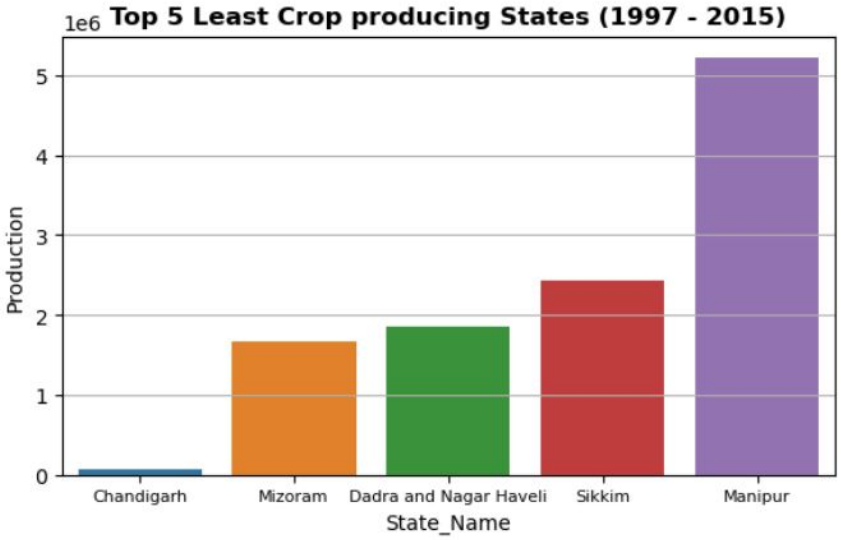
```
The data includes the following seasons:
1. Kharif
2. Whole Year
3. Autumn
4. Rabi
5. Summer
6. Winter
```

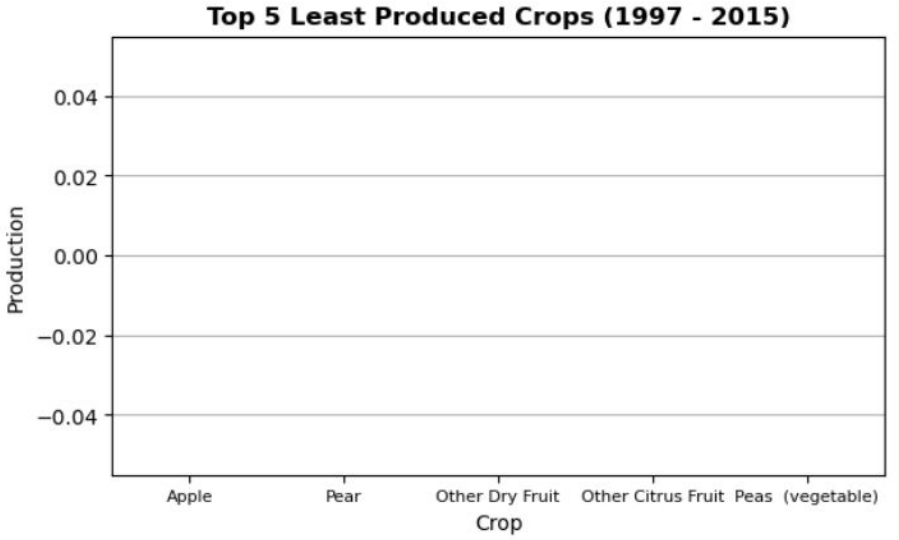
Most Produced Crops and Most Crop Producing States



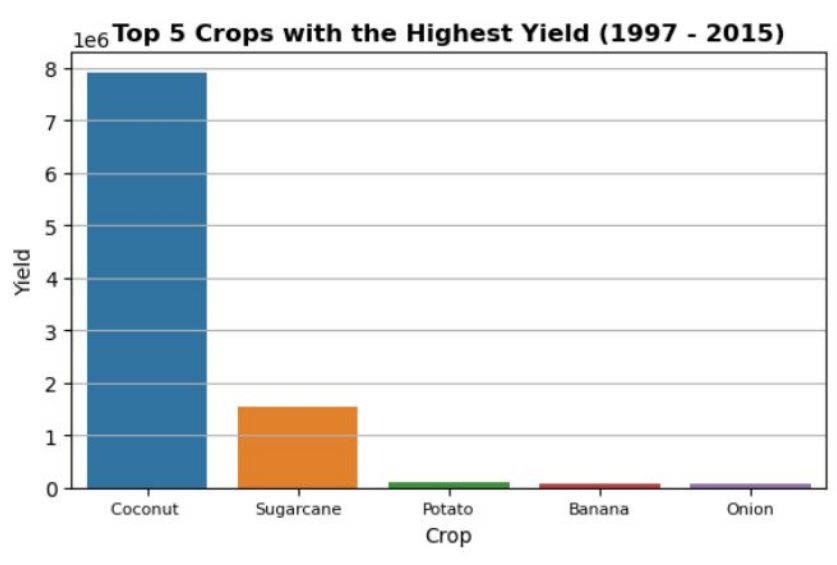


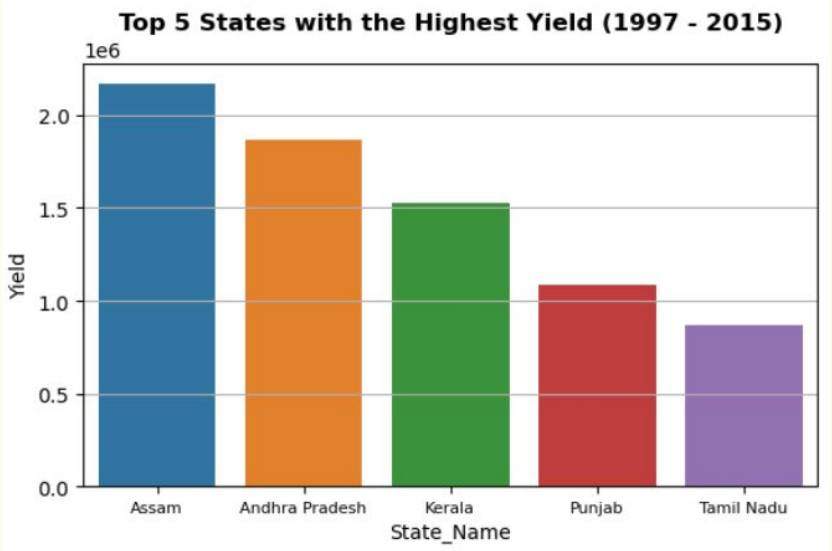
Least Produced Crops and Least Crop Producing States



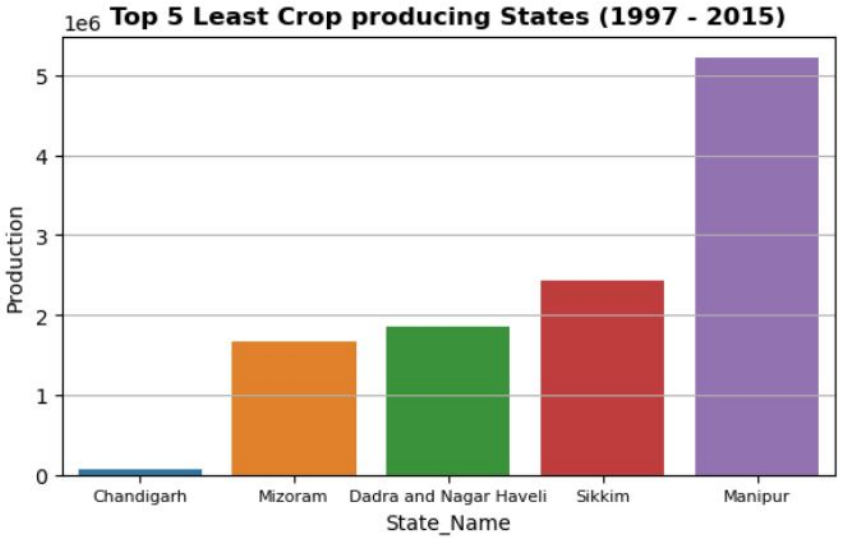


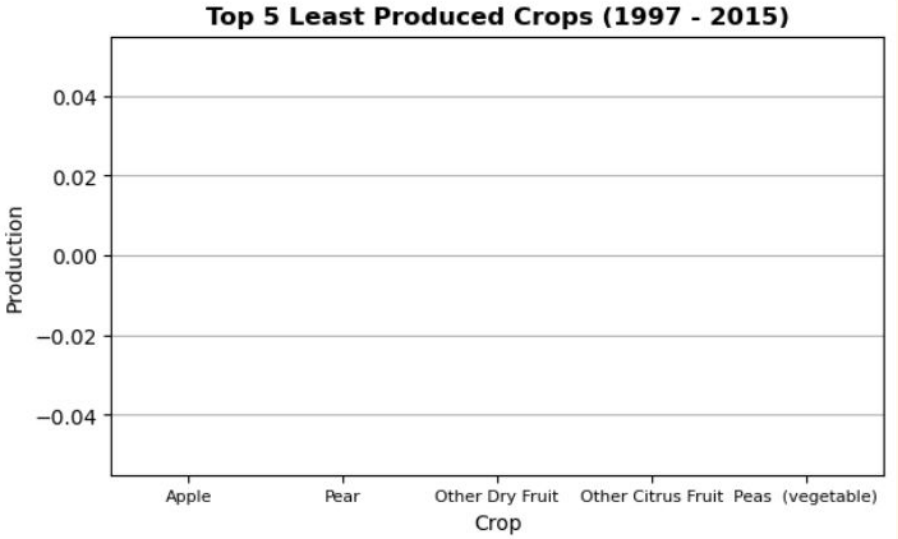
Highest Yielding Crops and the States with the Higest Yield



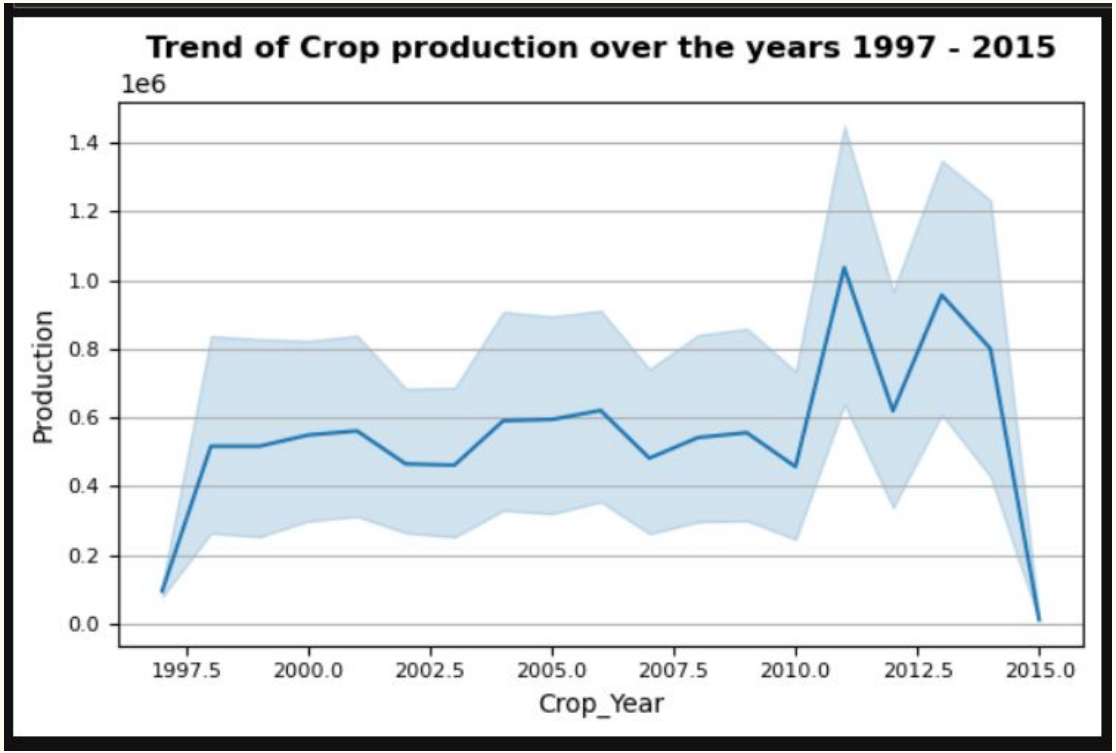


Lowest Yielding Crops and the States with the Lower Yield

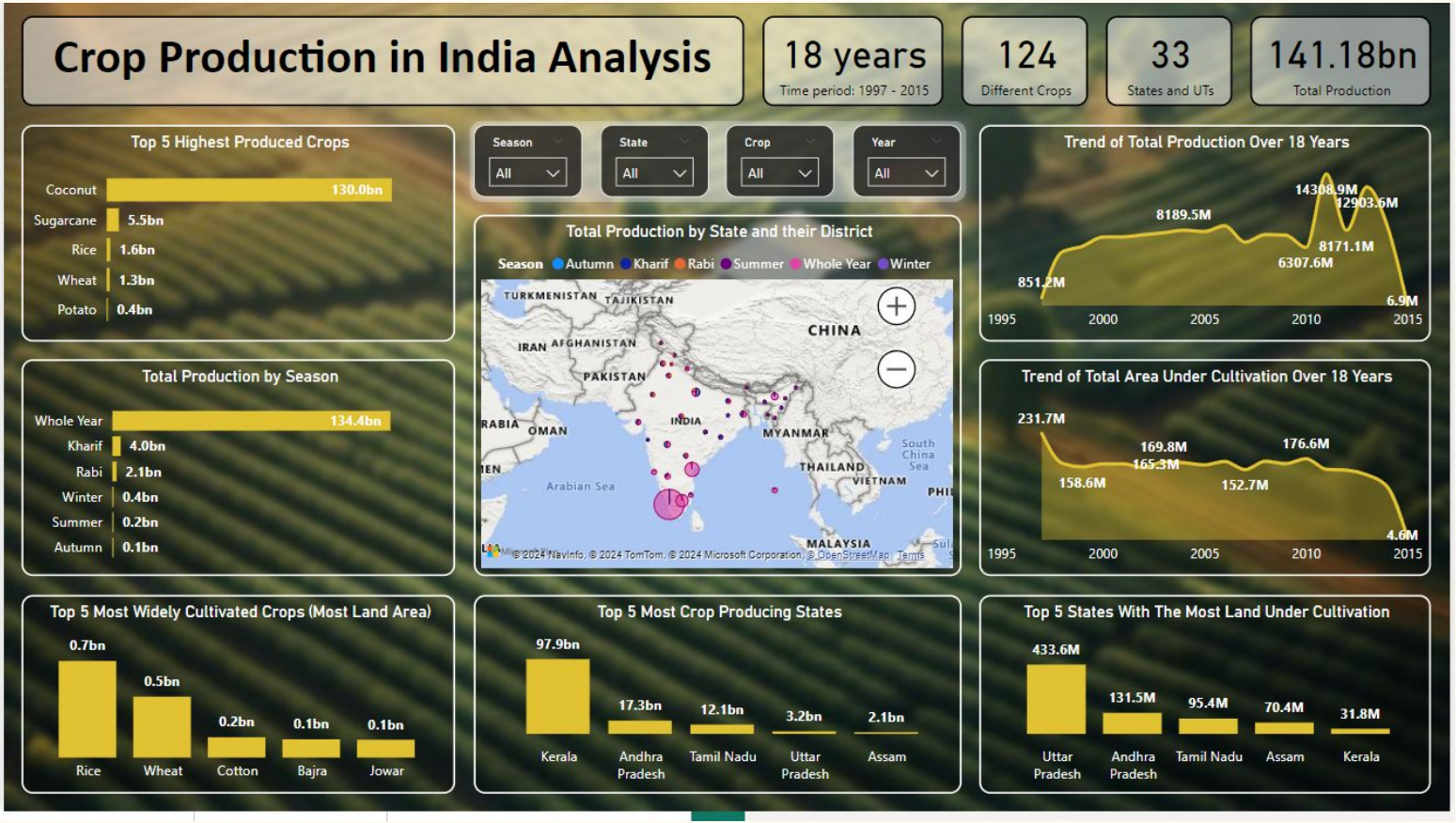




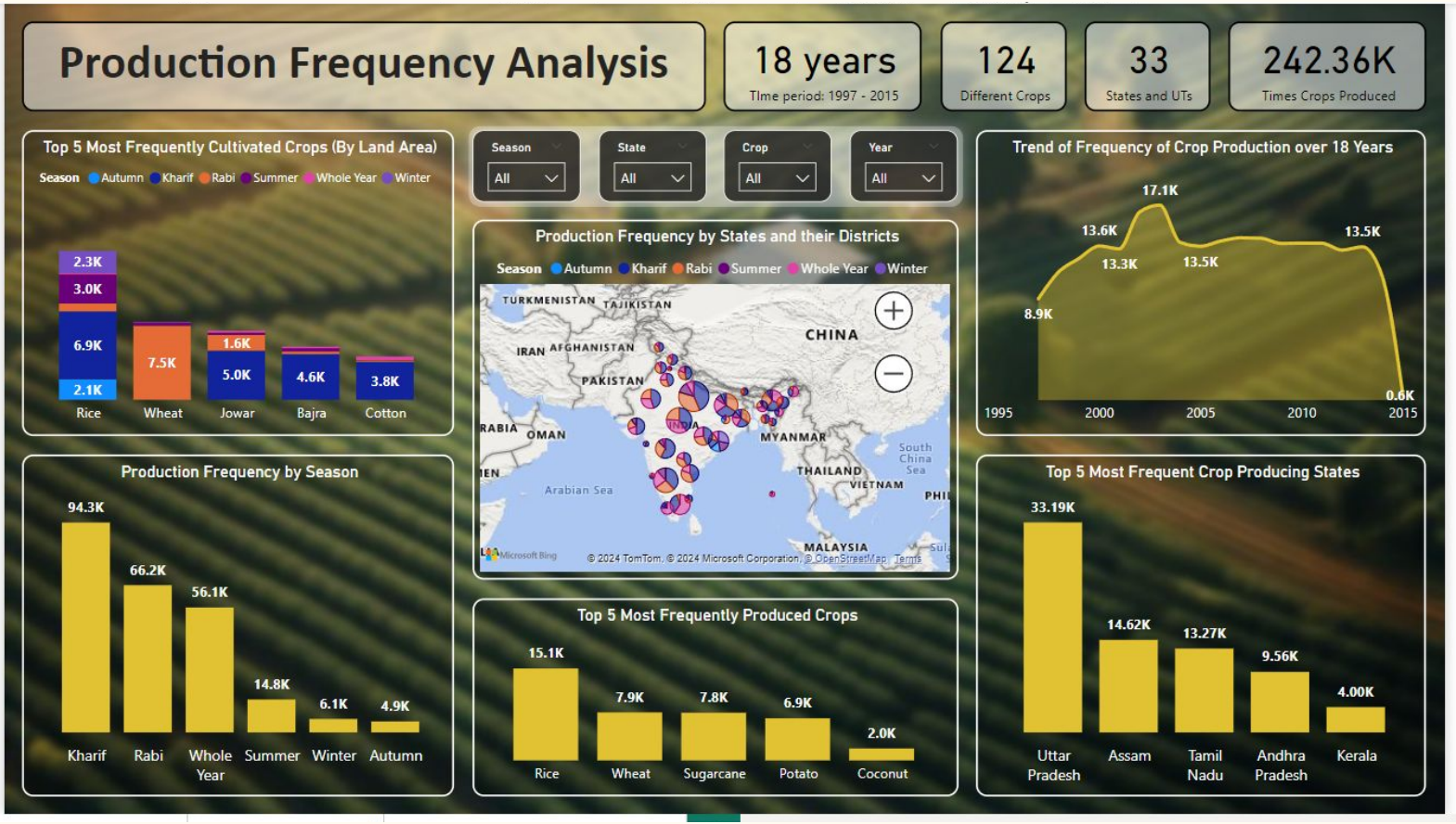
Trend of Crop Production



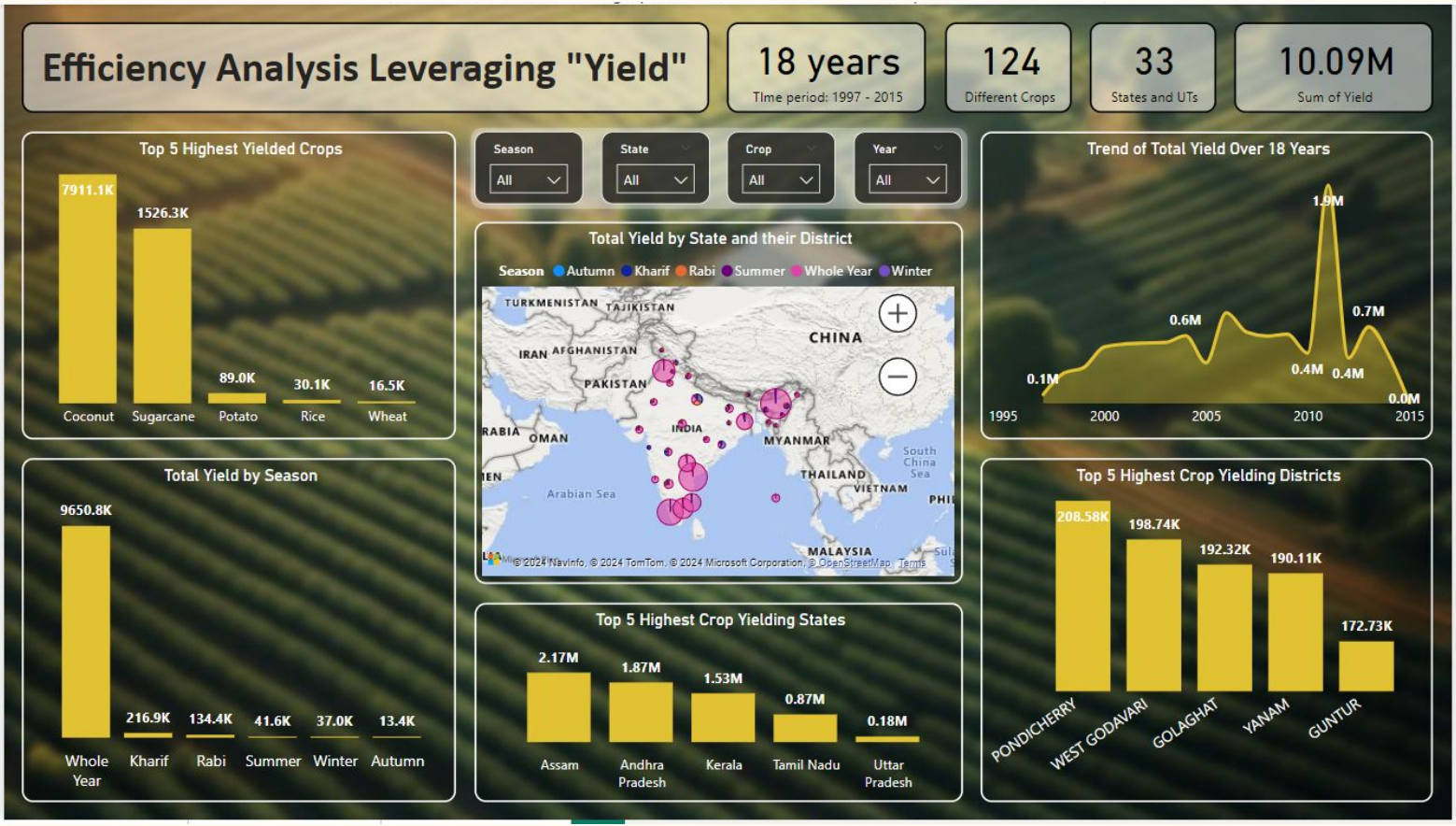
PowerBI DashBoard (Page 1: Total Production Analysis)



PowerBI DashBoard (Page 2: Frequency Analysis)



PowerBI DashBoard (Page 3: Efficiency Analysis)



Conclusion and Insights

- 33 regions, including Indian states and Union Territories, contributed to the cultivation and production of crops.
- Coconut cultivation depicts a high level of efficiency and yield as it wasn't even among the top 5 most frequently cultivated crops yet managed to have the highest yield and production.
- While Uttar Pradesh wasn't the top contributor (it was the 4th highest), it had the most land under cultivation.
- Rice was the most widely cultivated crop and the third highest produced crop, falling behind Coconut and Sugarcane. It was also the most frequently cultivated crop.
- The Kharif season experienced the most frequent production, yet the crops cultivated and produced throughout the year resulted in the highest amount of production.
- Total production was the highest in the year 2011, then dipped in 2012, rose again in 2013, and has been on a rapid decline ever since. The total area under cultivation as well as the frequency of cultivation has been declining as well.
- Yield briefly skyrocketed in 2011 and underwent a sharp dip ever since.

Recommendations:

- Better agricultural tools and practices should be implemented in states like Uttar Pradesh where the frequency of cultivation was high but the amount of production didn't justify that high frequency.
- Studies must be conducted to understand what led to the decline in production in the year 2012, what was done right in 2013 that led to a rise, and what factors again led to a decline.
- Studies must also be conducted to comprehend what factors have led to the decline in the total area under production and the sharp decline in yield after 2011.
- Better agricultural tools and machinery, as well as the cultivation of mass besides rice (since rice requires a lot more water), can help increase the income of farmers and diversify the types of crops produced.es of crops produced.

GitHub Link for the Jupyter Notebook and PowerBI Dashboards

GitHub Link

THANK YOU!

Prepared by Vedansh Chauhan