Visual analysis of Crop Production in Assam between 1997 & 2014

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Introduction

Agriculture is one of the most important primary occupations in Assam. Around 80% of the population of Assam is directly or indirectly dependent on agriculture in some way or another. so, the economy, development, and many more important aspects of the people of Assam are somewhat related to the agricultural factors of Assam. Crop production in Assam depends on a large number of factors ranging from season type to Area of cultivation.

We are going to conduct a visual analysis of the Crop production in Assam, and try to convey some basic but important conclusions that may help us to understand the agricultural environment of Assam.

Dataset Description

We are going to use the Crop Production in India Dataset for this project. Anyone willing to look into the dataset can access it through the link https://www.kaggle.com/datasets/abhinand05/crop-production-in-india?select=crop_production.csv.

The dataset consists of data for the whole of India, but we are using a subset of the data containing only information about the crop production of Assam for our analysis.

The top 6 rows of the Dataset are

```
##       District_Name Crop_Year      Season         Crop  Area Production
## 12378         BAKSA      2005 Autumn              Rice 17083      15415
## 12379         BAKSA      2005 Kharif         Arhar/Tur   191        115
## 12380         BAKSA      2005 Kharif       Castor seed    22         11
## 12381         BAKSA      2005 Kharif      Cotton(lint)     8          4
## 12382         BAKSA      2005 Kharif              Jute   382       3540
## 12383         BAKSA      2005 Kharif             Maize   179        134
```

The top 10 crops along with their mean production produced in Assam between 1997 & 2014 are

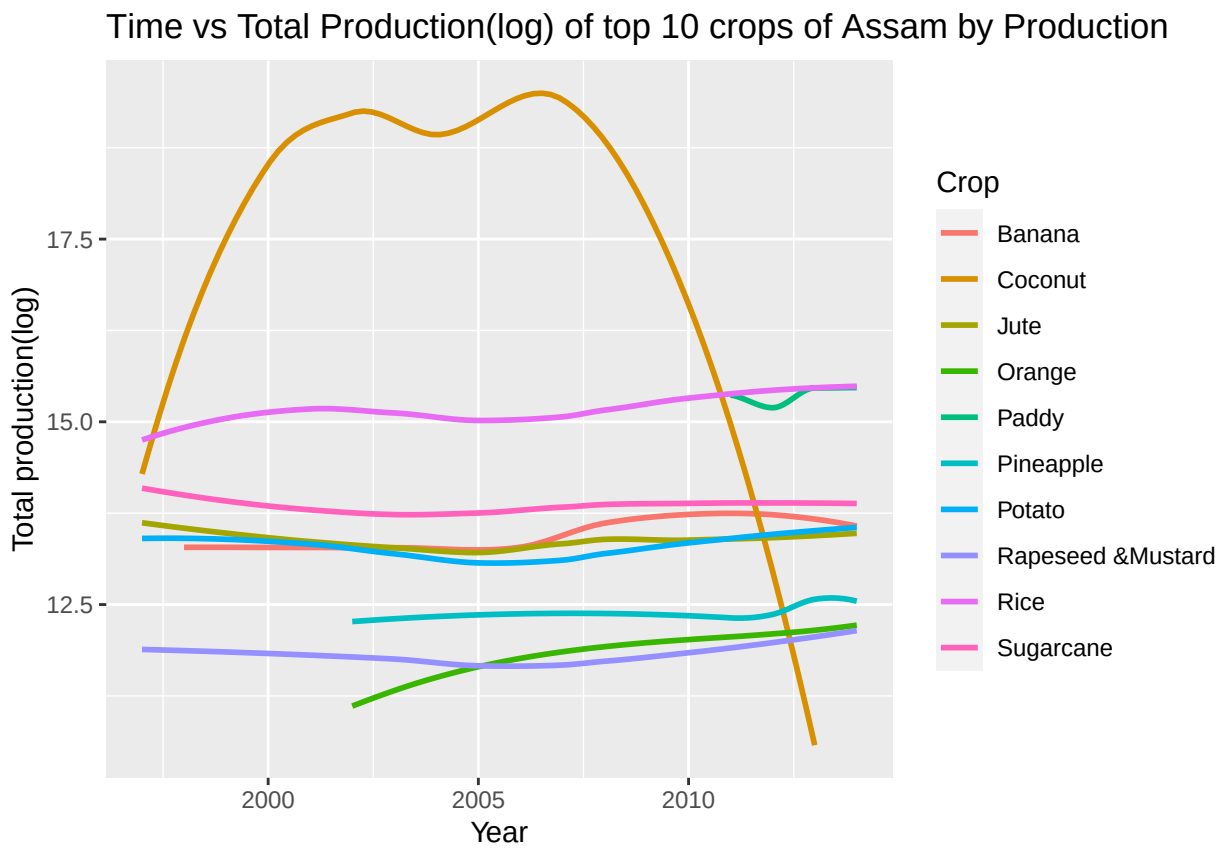
```
## # A tibble: 10 x 2
##    Crop                mean_production
##    <chr>                         <dbl>
##  1 "Coconut "                122150507.
##  2 "Paddy"                     4773969.
##  3 "Rice"                      3988949.
##  4 "Sugarcane"                 1047000.
##  5 "Banana"                     732774.
##  6 "Jute"                       654974
```

```
##  7 "Potato"                    612307.
##  8 "Pineapple"                 243554
##  9 "Orange"                    148812.
## 10 "Rapeseed &Mustard"         138651.
```

It is seen that for a particular crop, the area and the production is highly correlated, the correlation matrix for Rice is shown below.

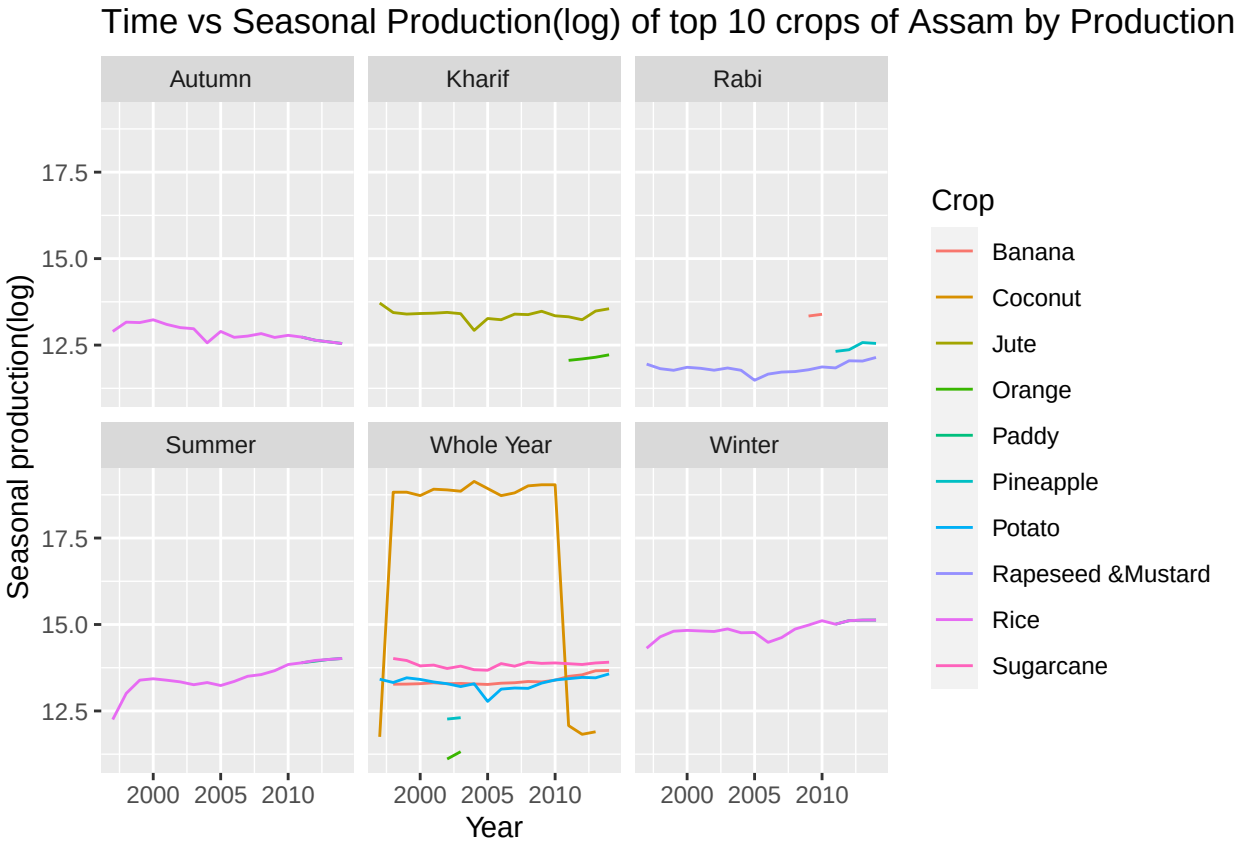
```
##                Area Production
## Area       1.000000   0.919998
## Production 0.919998   1.000000
```

Graphical presentation



From the above graph, we can see that although coconut production was the highest from 2000 to 2010, after 2010, there is a sudden drop in its production. Among other crops, we can see that all of them have a steady increase or decrease in production over time. Rice is seen to be in an increasing trend throughout the timeline.

Now let us see the seasonal production of the top crops produced.

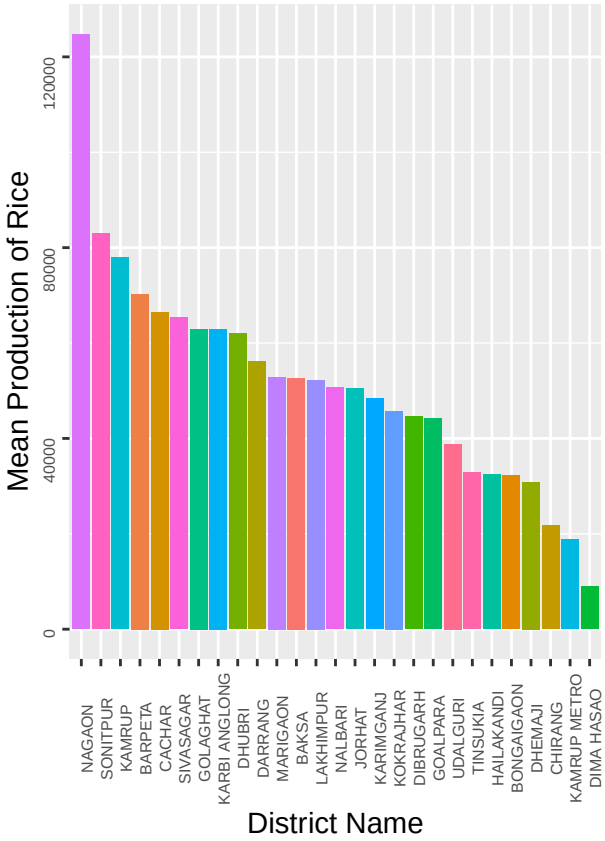


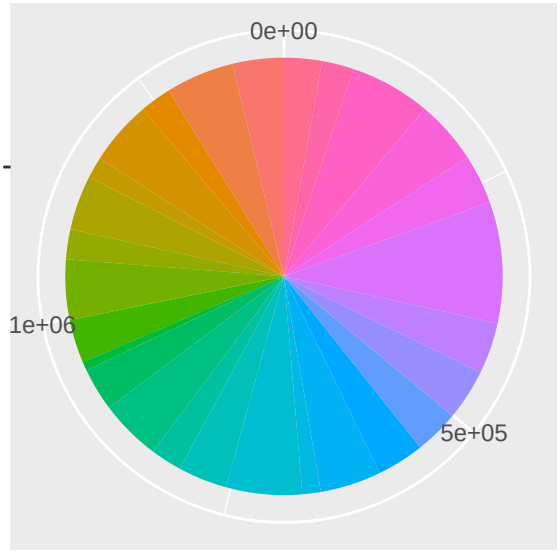
Now, we can see out of the top 10 crops only 6 of them are produced in the whole year. All other crops were produced on a seasonal basis.

Now if we look at the case of Rice, we see that it is produced in Autumn, Winter & Summer. In Winter & Summer, the trend of production is increasing over the years, but in Autumn the trend of Production is decreasing.

If we look closely enough, we can see that Jute is only produced in the Kharif season and its production is more or less constant over the timeline.

We will now focus on the analysis of Rice production, although analysis of other crops is also possible and those who are interested can visit my shiny app website for the same.

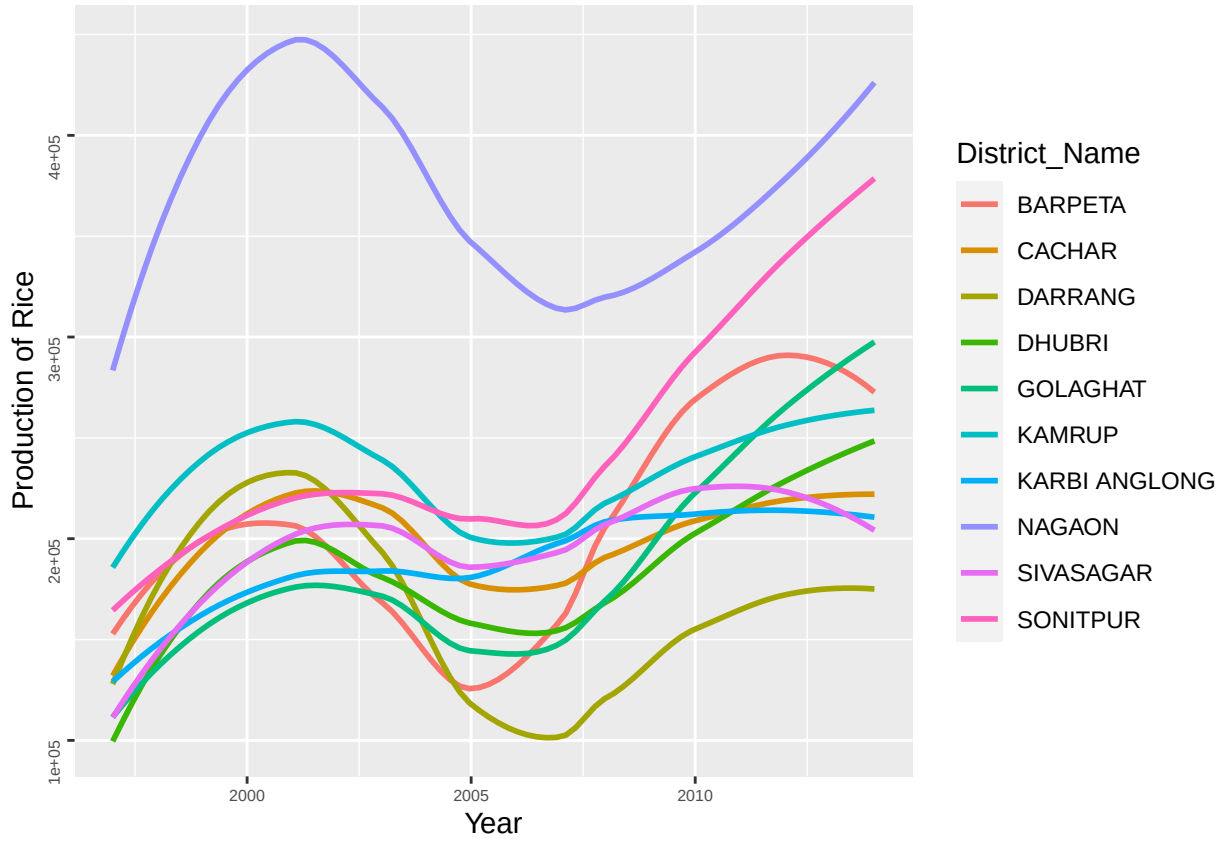




From the above graph, we can easily see that in the production of rice a large share is contributed by Nagaon as compared to other districts.

Similarly, when we look for other crops we find that Nagaon is the leading producer of most of the top crops produced in Assam, followed by Sonitpur.

Now we can look at the trend of rice production over the years for the top 10 rice producing Districts.



In the above plot, we have shown the trend of rice production over the years for the top 10 rice-producing Districts.

For more graphical presentation and analysis, please refer to my shiny app website.

Summary of Analysis

We have done a visual analysis of the Crop production in Assam between 1997 & 2014 and we have found some interesting conclusions regarding this. Some of them are:

1. The correlation between the Area and Production of a particular crop is mostly between 8 and 1, showing a strong positive correlation between Area and Production for a particular crop.
2. Coconut is the most-produced crop during the period between 1997 and 2014, although production after 2010 has diminished a lot.
3. Rice is the second most produced crop during the whole period. It is one of the most consistent crops whose production kept on increasing steadily over time, but its production for the autumn season is decreasing over time.
4. Among the 10 most produced crops during the time, only 6 of the 10 crops are produced during the whole year, the other 4 were seasonal crops.
5. For Rice, we found that Nagaon is the district with the highest production and its production is roughly around $\frac{1}{8}th$ of the total production of the state.

6. Nagaon is also the leading producer of Paddy, Sugarcane, Banana & Jute in Assam which is also among the most produced crops in Assam making Nagaon one of the most agricultural-friendly districts in Assam.

#I have covered most of the basic visual analysis possible for the data. For further analysis and graphical presentation of the data, please go to my shiny app website.

Conclusion

We have tried our level best to conduct a visual analysis of Crop Production in Assam and provide some important conclusions on it. The data we used is publically available and we assumed it to be correct up to a certain level while making important conclusions for the project.

We can't present to you every graph and plot we used for this analysis. Anyone willing to look into them can check them on the Shiny app website provided in the first part of the project.