African Agriculture (2004 - 2013)

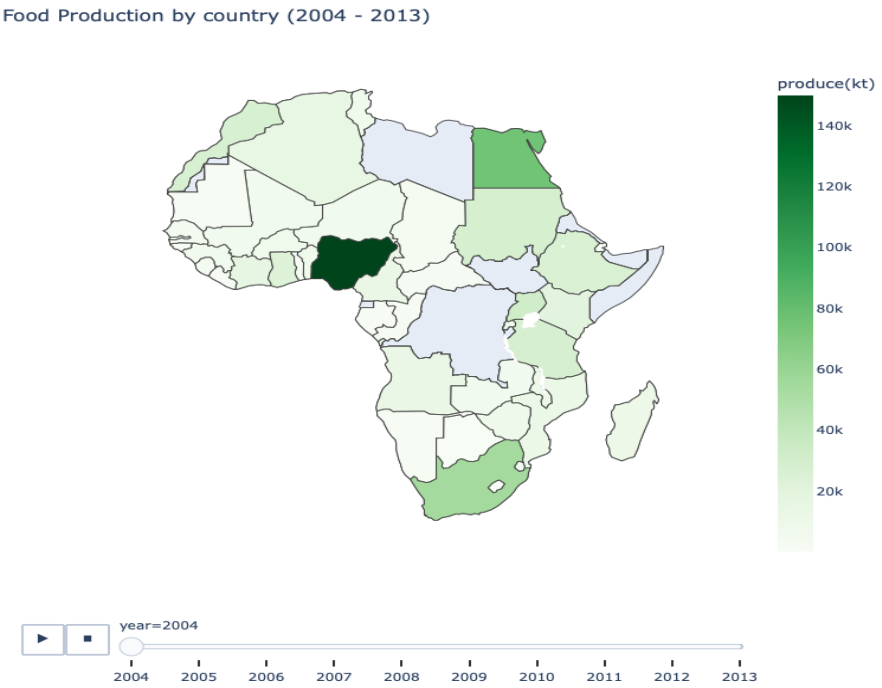
Source: https://www.africanexponent.com

Agriculture is Africa's most important economic activity. Africa has a large population working in Agriculture as it provides employment for about two-thirds of its working population. Data on Africa's food production and supply hold some very interesting insights about its agricultural activities which are not easily explained by mere words. This article aims to provide insights into Africa's agricultural activities from 2004 to 2013.

Africa produced 94 different products in kilotons (kt) from 2004 to 2013 with Cassava, Sugar cane, Maize, Yams, and Vegetables being the top 5 products across the continent.

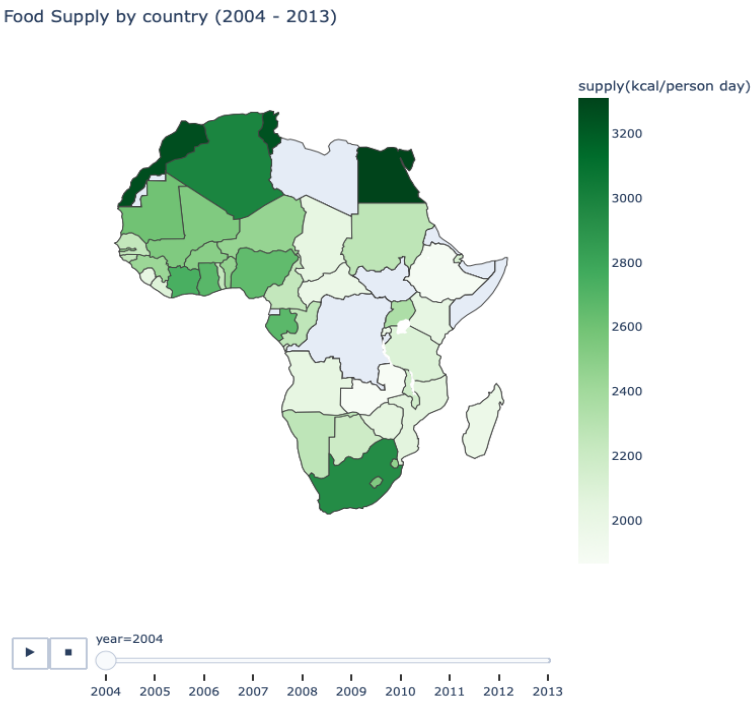
We are yet left with questions such as:
What countries produce the most foods? What countries produce the least? How does food production by country vary over the years?

The image below shows the total quantity of food produced by each country from 2004 to 2013. An interesting detail about this data is that Nigeria, Egypt, and South Africa consistently remained the top 3 food producers in the 10-year period of my analysis. The least producing countries are mostly from Western and Southern Africa.



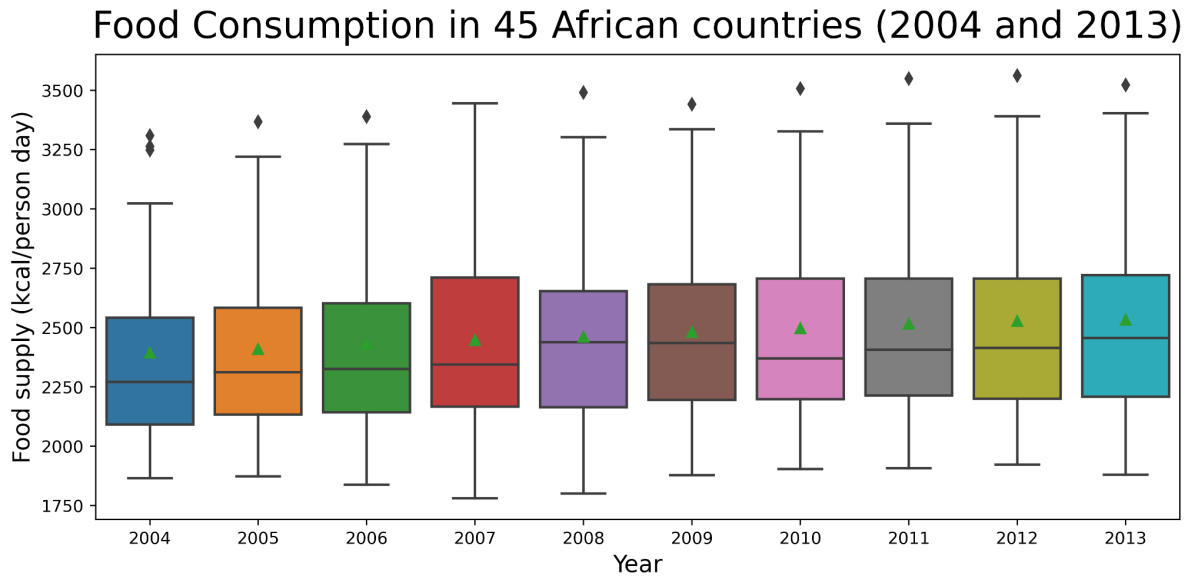
The Colour grey denotes areas with missing information. Refer to notebook for interactive visual

I explored the food supply data for these countries and got some interesting insights. Despite Nigeria, Egypt, and South Africa being the top food-producing countries from 2004 to 2013, the following visualization shows that Egypt, Morocco, and Tunisia had the highest food supply per capita; as the hue suggests, Egypt was clear of the other countries by fine margins in terms of food supply within this time frame.



Refer to notebook for interactive visual

The box plots provide visual evidence of outliers in the food supply dataset



Now we have concluded there are outliers, this raises the question: which countries are the sources of these outliers?

To answer the previous question, I created a visual to show outliers by country name based on where they fall. A data point is considered an outlier if it falls above or below the upper and lower fences respectively.

Essential parameters:

$Q1 = First\ Quatile$

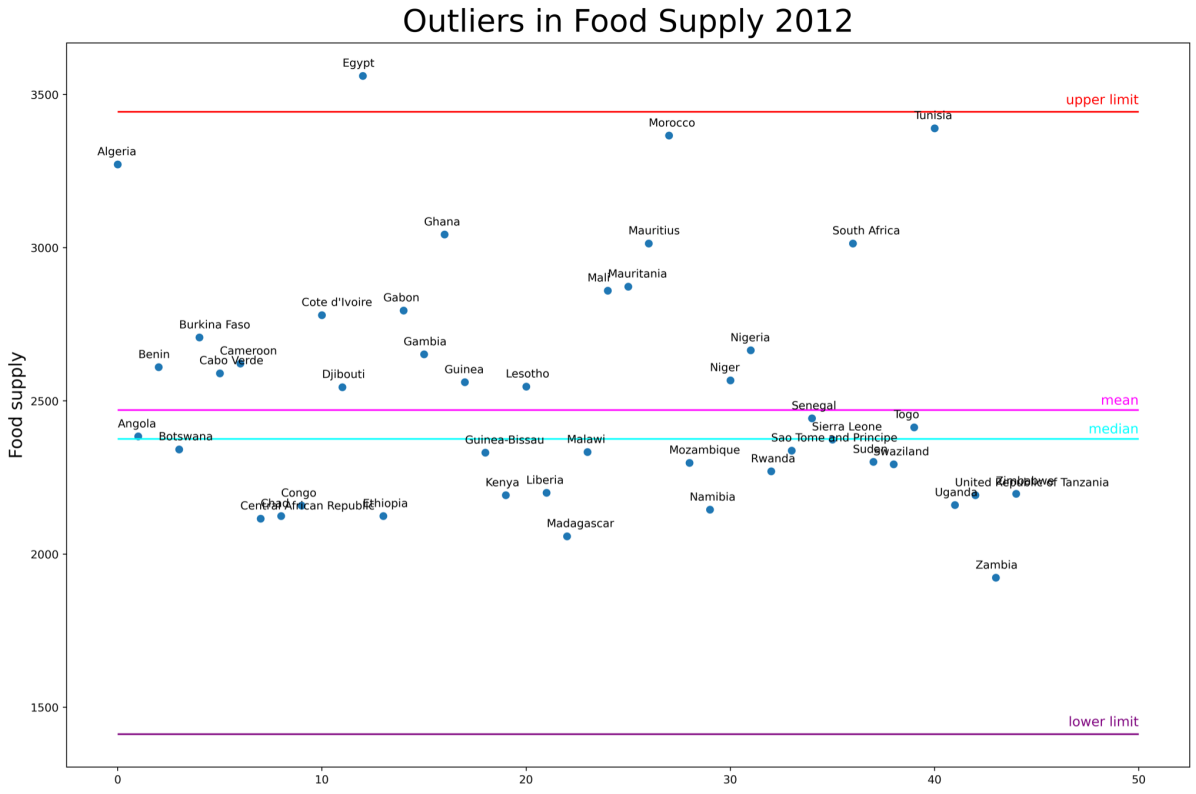
$Q3 = Third\ Quatile$

$Inter\ quatile\ range(IQR) = Q3 - Q1$

$lower\ fence = Q1 - 1.5(IQR)$

$upper\ fense = Q3 + 1.5(IQR)$

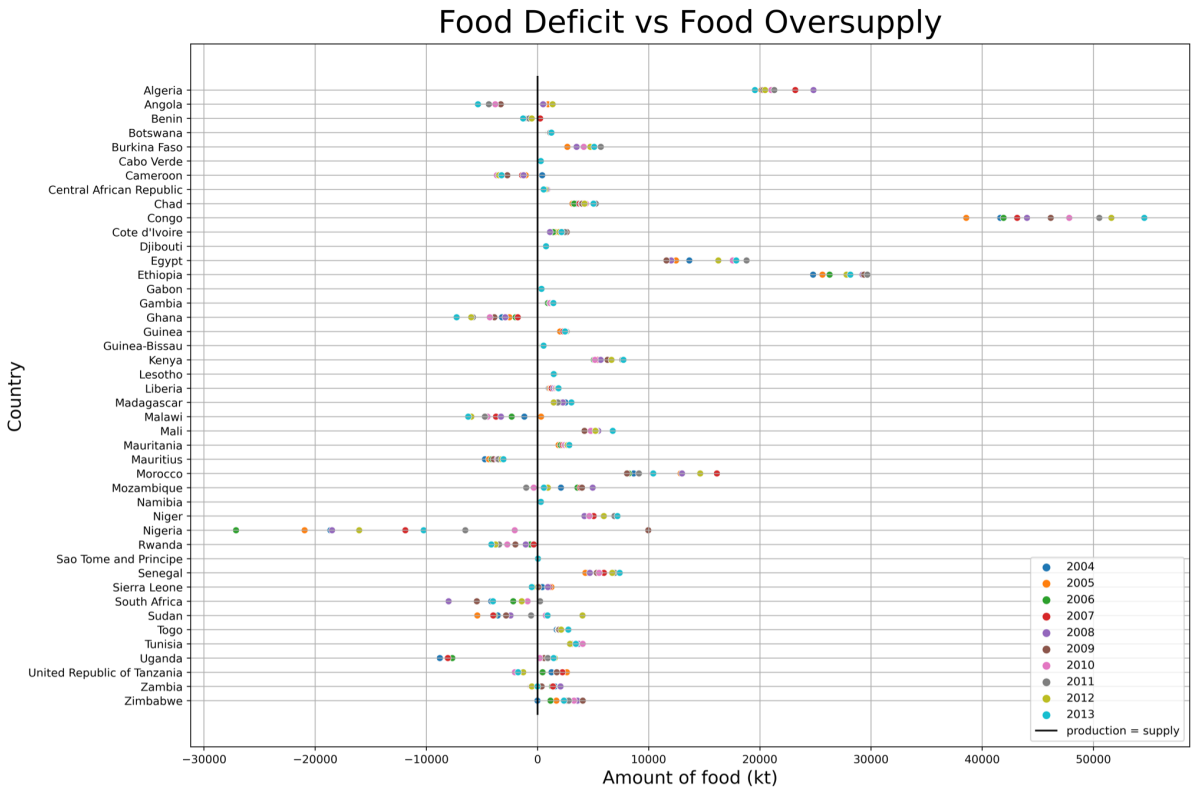
Though my analysis suggests Egypt was an outlier for more than a year, 2012 stands out.



We can see that Egypt is above the upper fence, therefore, it's an outlier. In conclusion, Egypt had significantly higher food available for consumption than other African countries.

Food Deficit and Oversupply

Now that we have established the outliers in the food supply, I took a step further by comparing the food production and supply of each country from 2004 to 2013. From my earlier analysis, some countries had massive production in kilotons but lower supply. The following figure shows the food deficit vs oversupply for each country each year.



Despite Nigeria being the higher food-producing country in this period, Nigeria only managed adequate supply in 2009. Egypt had no deficit and Ghana only had deficits. The years that fall on the black vertical line are years in which Production = Supply. There was a sum of 412,943.2 kilotons in food deficit and a sum of 1,832,282 kilotons in food oversupply.

Test of Hypothesis

Rice is a carbohydrate food eaten in most parts of the world. One could hypothetically say rice feeds the world. In fact, rice was the third most-produced food worldwide in 2014, according to the FAO.

However, I am curious to know if there happens to be a relationship between rice production in Africa, and its population. I will carry out this analysis using Pearson Correlation Test.

Null hypothesis

There will be no significant correlation between the mean amount of rice produced in a year (in kt) (X) in African countries and the mean population of African countries in that year (Y).

Alternative Hypothesis

There will be a significant correlation between the mean amount of rice produced in a year (in kt) (X) in African countries and the mean population of African countries in that year (Y).

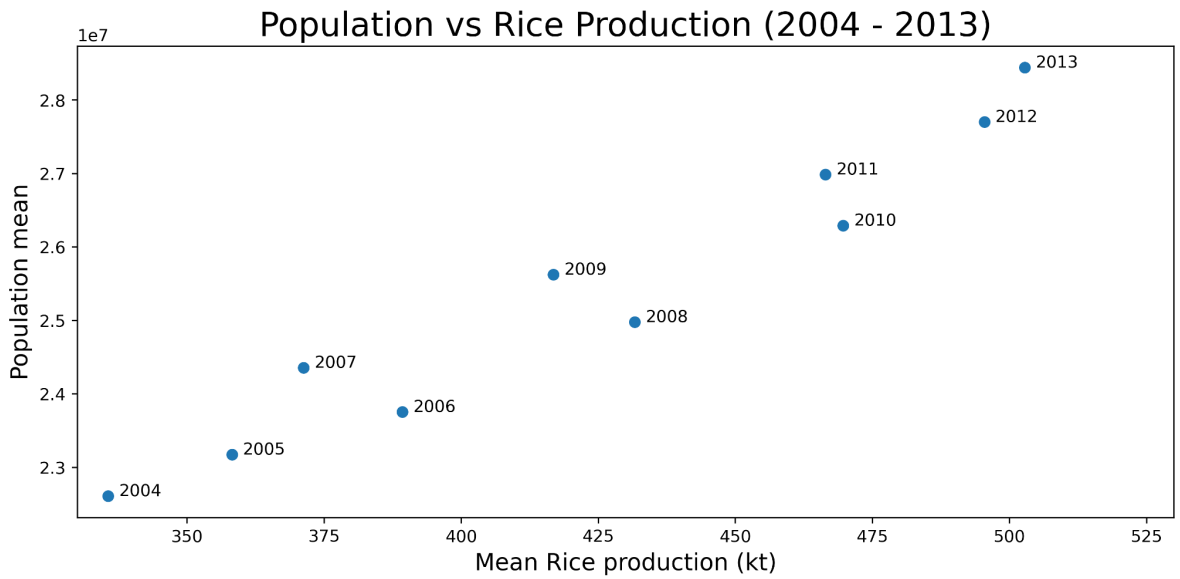
X = The mean amount of rice produced in a year (in kt)
Y = the mean population of African countries in that year

Of the 45 countries, only 37 produced rice. I have collated the mean rice production and population of these countries per year.

Results:

- A correlation coefficient of 0.97 indicates a significant correlation between the mean rice production and the mean population of African countries from 2004 to 2013.
- A probability value less than zero indicates it is quite unlikely for my null hypothesis to be true

Test Conclusion:
The null hypothesis that the two variables are independent is rejected based on the Pearson Correlation Test results.



Conclusion

Agriculture plays a major role in providing food and jobs for Africans and given its socioeconomic impact on the life of Africans, it is a sector that must be nurtured despite Africa's wealth in natural resources.

More efforts should be put into bridging the gap between food production and food available for consumption. There's a need to develop better food production, storage, and distribution systems to minimize waste, create more job opportunities and generate more revenues.