

# Coffee Quality Analysis

- **About The Data** –

The Coffee Quality Institute (CQI) is a non-profit organization that works to improve the quality and value of coffee worldwide. It was founded in 1996 and has its headquarters in California, USA.

CQI's mission is to promote coffee quality through a range of activities that include research, training, and certification programs. The organization works with coffee growers, processors, roasters, and other stakeholders to improve coffee quality standards, promote sustainability, and support the development of the specialty coffee industry.

- **Problem Statements** –

- Our work is to bring out the best coffee beans out of the dataset and from where those beans are getting harvested, what are the best processing methods, from where the defects are coming and why, what features are effecting on coffee quality and how much.

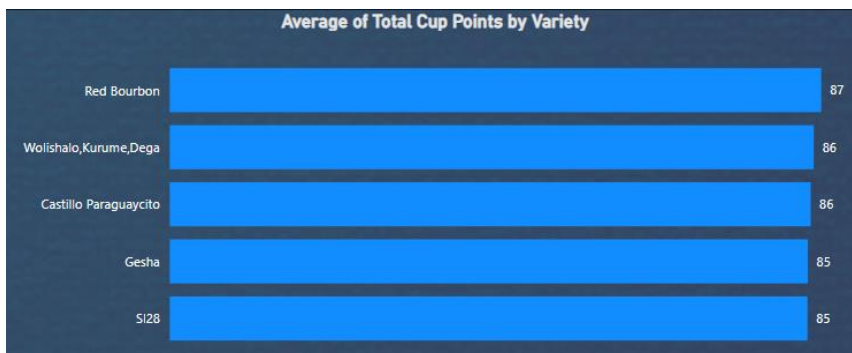
- **Data Preprocessing** –

- Tools used – Power BI Desktop, Power Query Editor, DAX Query.
- Starting with feature engineering some of the unnecessary columns like ID, Lot Number, In-Country Partner, Status and defects have been deleted. Added a column to get the total kgs of beans by multiplying No. Of Bags and Bag Weights column.
- Dealing with null values all the null values were categorical and those were impossible to predict so those were named as Unknown. Made Harvested Year column values into range type as some of those were in range. Grading Date & Expiration column were in categorical type, so these were changed to date/time format by doing some value modifications.
- All these data cleaning process are done in Power Query Editor & DAX.

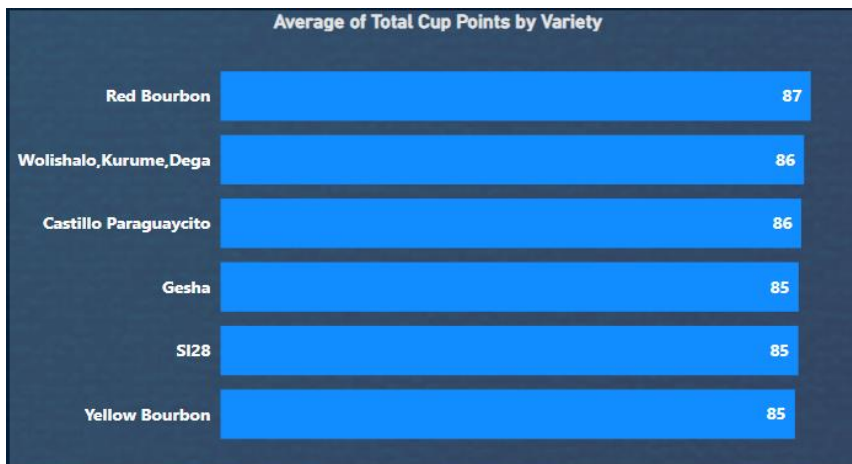
## Analysis –

TOTAL COFFEE CUPPING QUALITY SCORE		
90 - 100	OUTSTANDING	SPECIALTY COFFEE
85 - 89.99	EXCELLENT	
80 - 84.99	VERY GOOD	
< 80.0	BELOW SPECIALTY COFFEE QUALITY	NOT SPECIALTY COFFEE

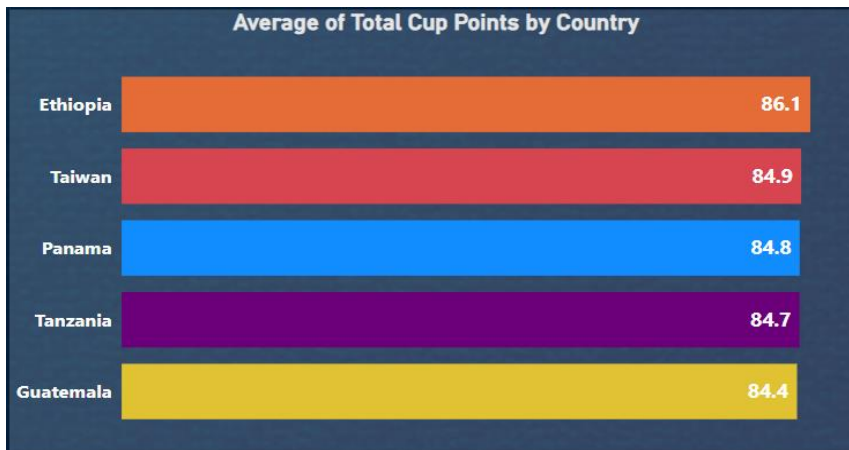
This chart is to show the coffee cup quality parameters.



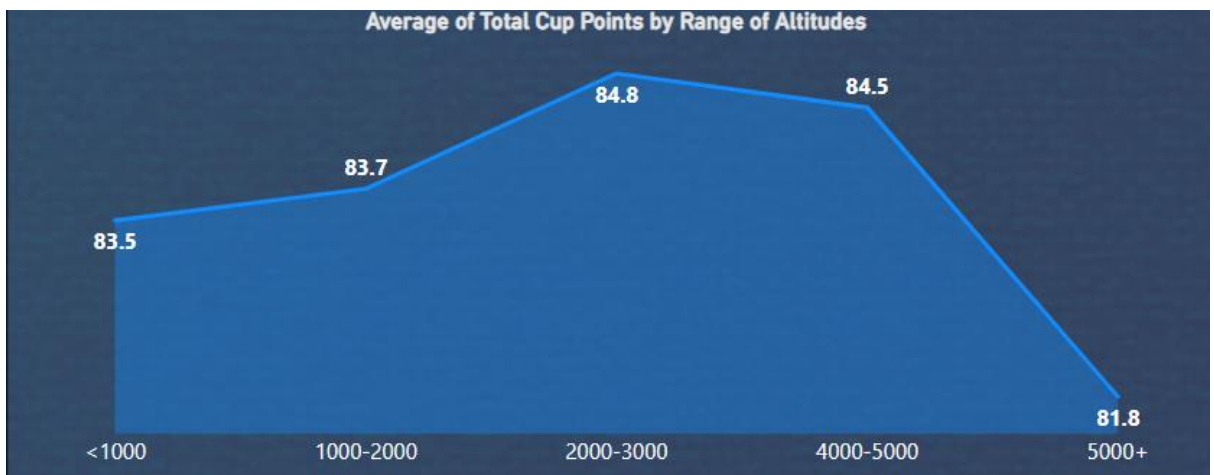
- All time top 5 Variety of beans are Red Bourbon, Wolishalo-Kurume-Dega, Castillo Paraguaycito, Gesha and SL28.



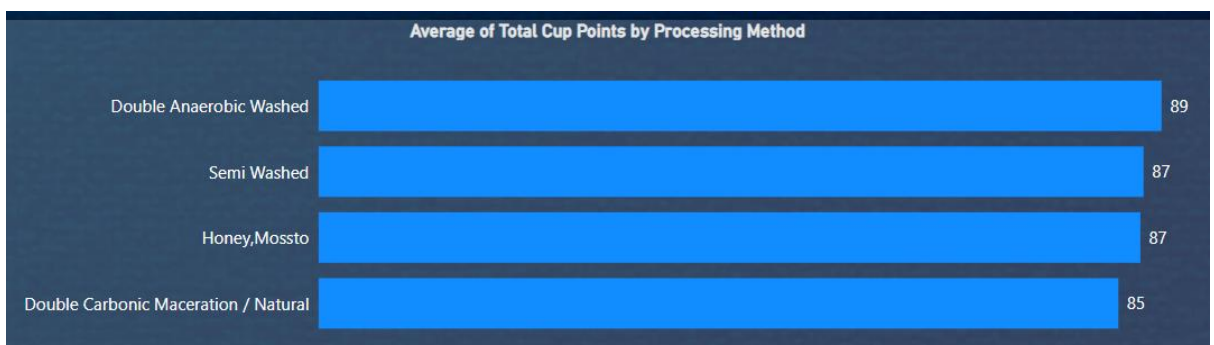
- In the latest year 2022/2023 Red Bourbon, Wolishalo-Kurume-Dega, Castillo Paraguaycito, Gesha, SL28, Yellow Bourbon are the excellent quality beans as per the above chart.



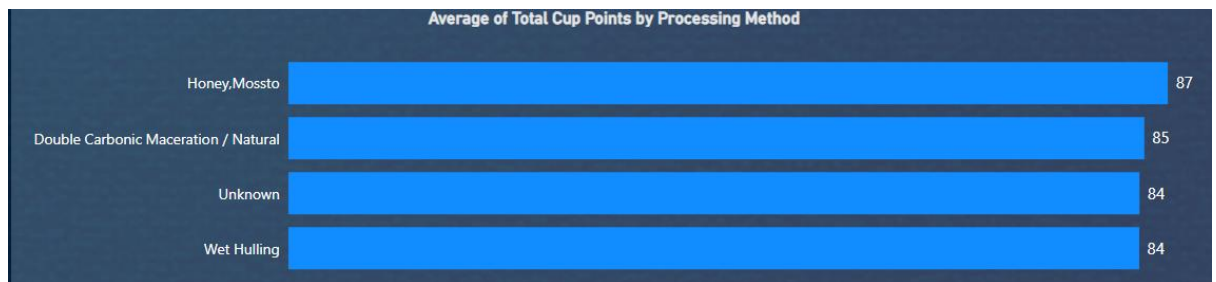
- These are the top 5 countries in terms of good quality coffee beans production. Where Ethiopia seems to be the only country to fall into the excellent parameter.



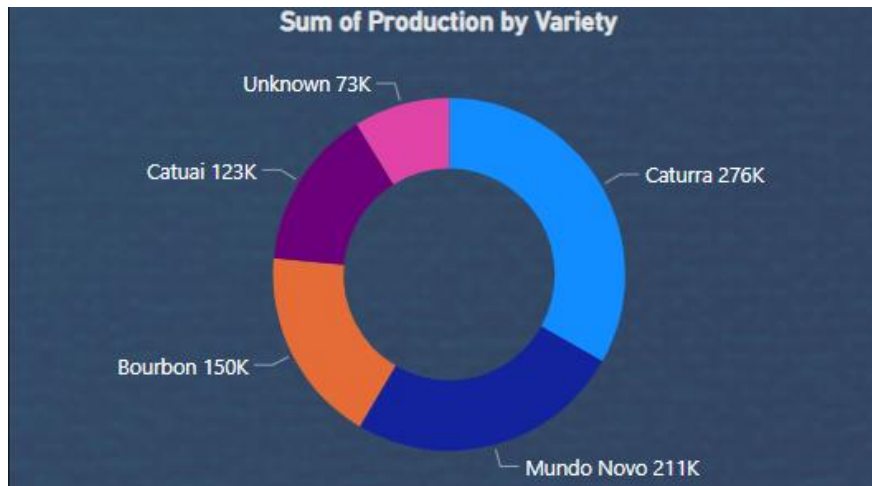
- We can see from the line chart that the quality is increasing from above 1000 meters altitude and after 5000 meter it is having a great fall of quality.



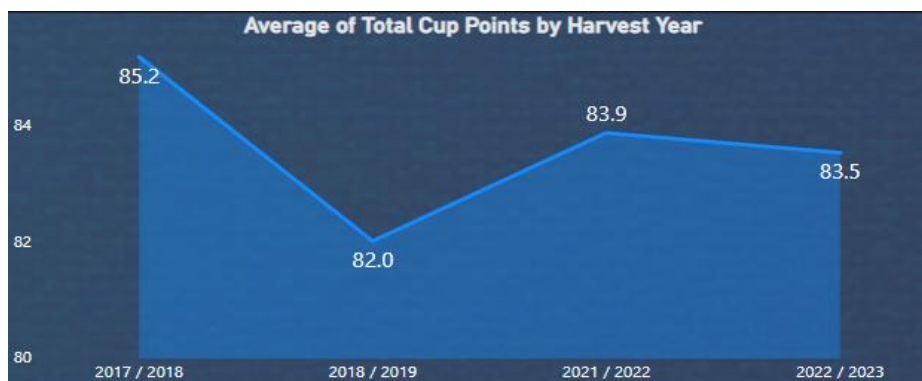
- Double Anaerobic Washed, Semi Washed, Honey/Mossto, Double Carbonic Maceration/Natural are all time best processing methods.



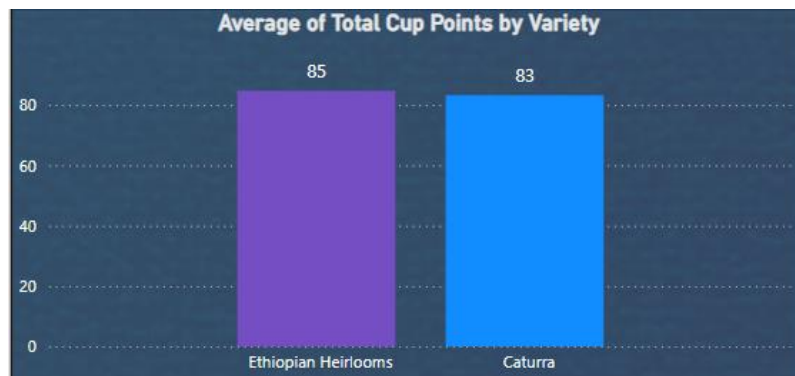
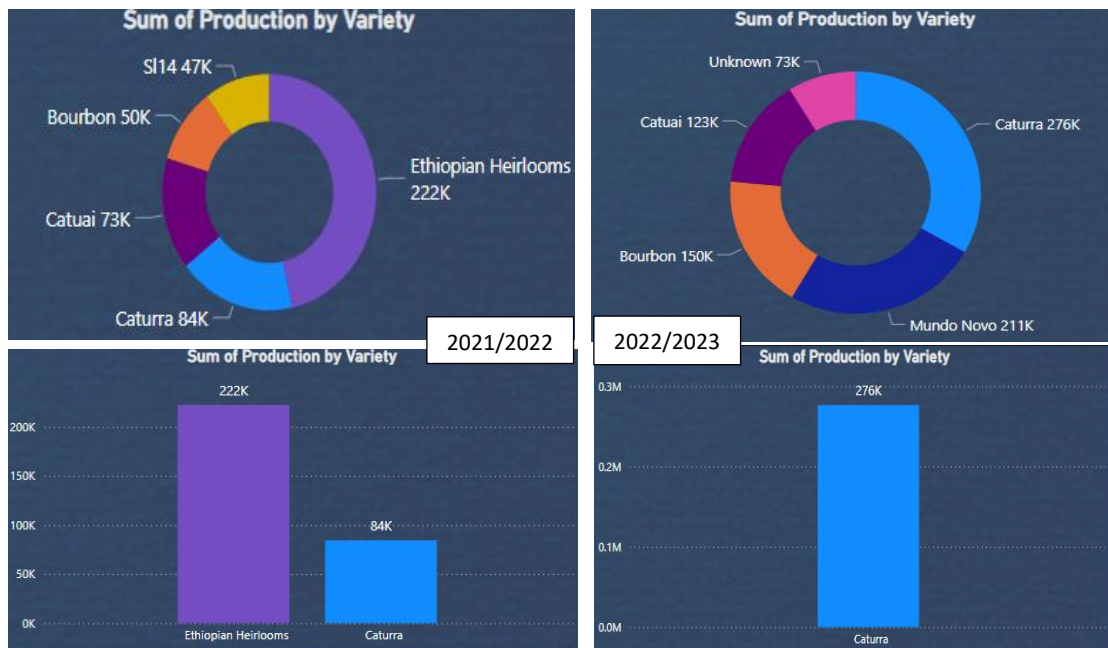
- Honey,Mossto and Double Carbonic Maceration / Natural are the processing methods in which coffee beans are getting excellent quality on average.



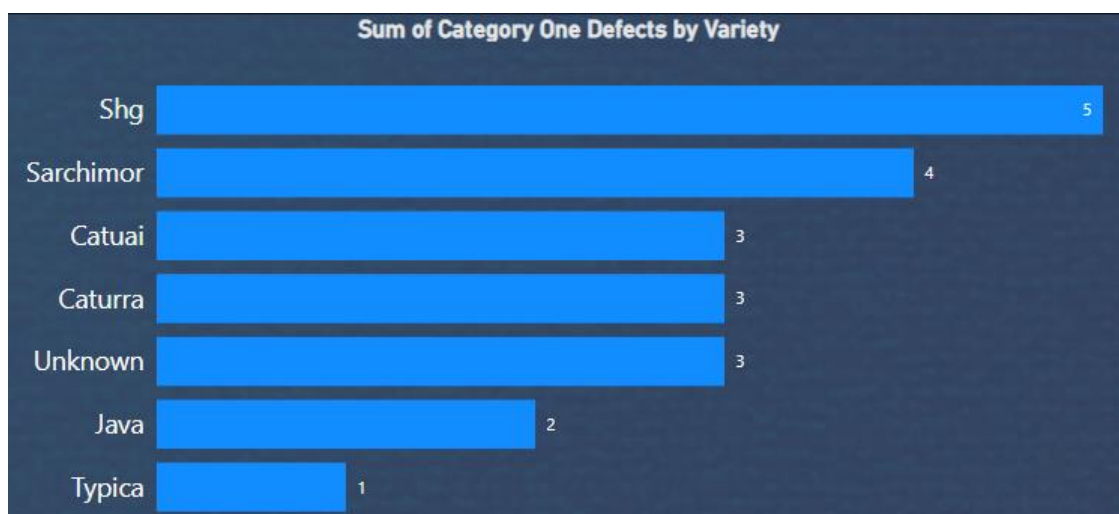
- Caturra is the most producing coffee beans of year 2022/2023 following with Mundo Novo, Bourbon, Catuai and others.



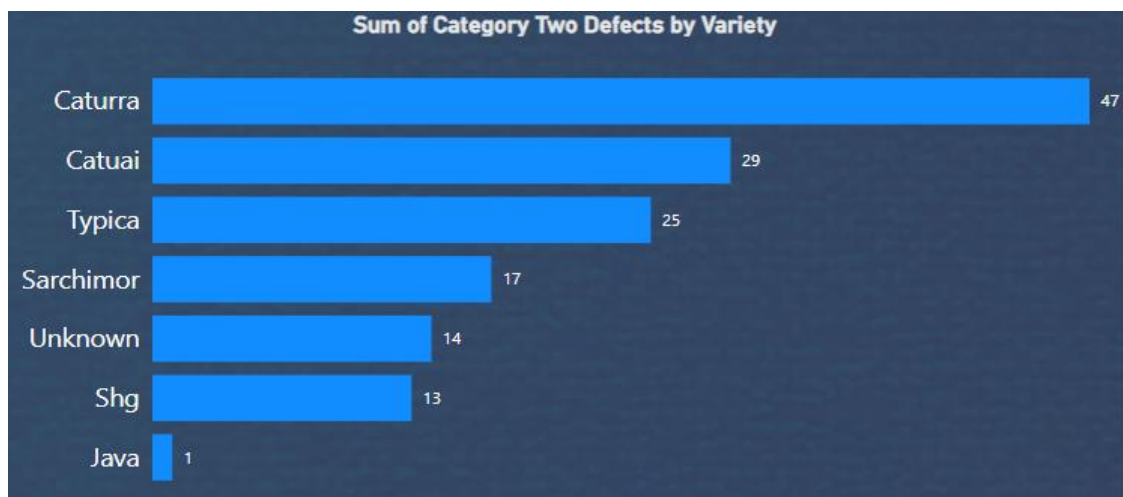
- The quality has decreased a little from 2021/2022.



- The decrease in quality may be cause of Ethiopian Heirlooms having zero production where as Caturra's production has increased almost 3x. And Ethiopian Heirlooms have 2 cup points more than Caturra, this is why the average has gone down.



- These are the varieties where category one defects have occur, and "Shg" is on top of the list with 5 beans.



- These are the varieties where category two defects have occur, and “Caturra” is on top of it with 47 beans.

0.94	0.93	0.93	0.90	0.87	0.85
Flavor coeff	Aftertaste coeff	Balance coeff	Acidity coeff	Aroma coeff	Body coeff

- This is how each sensory attributes are correlated with Cup Points. Where we can see Flavor has the strongest correlation.

## Insights-

- **Excellent rated coffee beans are getting harvested from an altitude of 2000 - 5000 meter .**
- **Brazil has the most production rates of over 300k kgs with Very Good quality coffee beans ranging from 80 to 84.99 cup points.**
- **Harvestation has increased after 2019 for almost 920k kgs.**
- **Double Anaerobic Washed, Semi Washed, Honey/Mossto, Double Carbonic Maceration/Natural are the Processing Methods which are giving excellent quality beans.**
- **Flavor, Aftertaste, Balance, Acidity, Aroma and body these are the sensory attributes that has very strong correlation with cup points. The more it goes the more cup points are achieved.**

- Mexico, Nicaragua, Hawaii, Colombia and Thailand these are the countries where category one defects are most.
- Ethiopia, Honduras, El Salvador, Colombia and Guatemala are the countries where category two defects are most.

- Suggestions –

- Harvest Castillo, Red Bourbon, Gesha, Wolishalo, Castillo Paraguaycito varieties more to get the qualities as best.
- Tanzania, Taiwan, Madagascar, these countries must produce more.
- To get best quality coffee, beans should be harvested from an altitude of 2000 to 5000 meter.
- Double Anaerobic Washed, Semi Washed, Honey/Mossto, Double Carbonic Maceration/Natural, use these processing methods.