The Journey of Coffee: From Plant to Cup.

Data Visualization project

Data Visualization 2023-2024

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15 gennaio 2024

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Abstract

Coffee is the second most consumed drink in the world and has become an irreplaceable pillar in the daily routine of millions of people. Whether to start the day with energy, for an invigorating afternoon break, or as a pretext for social gatherings, the consumption of two or three cups a day has become a norm for many. But, while we delight in its unmistakable aroma and rich flavour, how many times have we stopped to reflect on how our coffee is produced? And are we really aware of how has coffee production changed in recent years? In this space, we aim to explore precisely these questions. Coffee is not just a question of taste and tradition; it is also a complex story of agriculture, economics and environmental impact. Over the past twenty years, coffee production has undergone significant evolution, often driven by growing global demand. But at what price? Our goal is simple but fundamental: to increase coffee consumers' awareness of the environmental implications behind this widespread and beloved drink. When we enjoy our daily coffee, we often don't consider the journey each bean has made to get to our cups. This journey, however, is filled with stories about land use, water management, agricultural practices and, above all, the impact on forests, biodiversity and communities. It is also important to recognize how the growing consumption of coffee is affecting people's quality of life, particularly considering the increase in its use across all age groups, including the youngest.

1 Introduction

Our target group is very diverse. Primarily, however, it refers to coffee consumers as we want to make them aware of the fact that behind a cup of coffee there are many issues involved such as the environment, ethics and people's health. Secondly, we also want to address environmental associations who can use this visualization for their campaign to save the environment.

1.1 Research Question

Our research question consists of two points: Firstly we want to understand how coffee production has changed over the last 30 years due to globalization and what consequences it has brought to the environment and secondly we want to understand how coffee is influencing people's lives as according to statistics there are more and more coffee consumers and the age of consumers is getting lower and lower

1.2 Main target

Our target group is very diverse. Primarily, however, it refers to coffee consumers as we want to make them aware of the fact that behind a cup of coffee there are many issues involved such as the environment, ethics and people's health. Secondly, we also want to address environmental associations who can use this visualization for their campaign to save the environment.

1.3 Desired outcome

With this visualization we therefore want to make people aware of what is behind the production of coffee and what consequences it may have. We would like to specify that we do not want to demonize coffee, but only to report facts so that more and more people have at least the right knowledge to make a choice.

2 Git Hub Link

GitHub Link, `https://github.com/delgigio/Data_visualization.git`, (15.01.2024).

3 Data pre-processing

In general the preprocessing that was done for the visualizations was basic feature selection: removing features that where not used, or adding data that was useful in these scenarios. In certain cases we chose to visualize only a numbered amount of countries, exclude the large part and include only the main 5-6 countries, for exports and imports as it would lead to confusion in the visualizations and make it unreadable

4 Data visualization

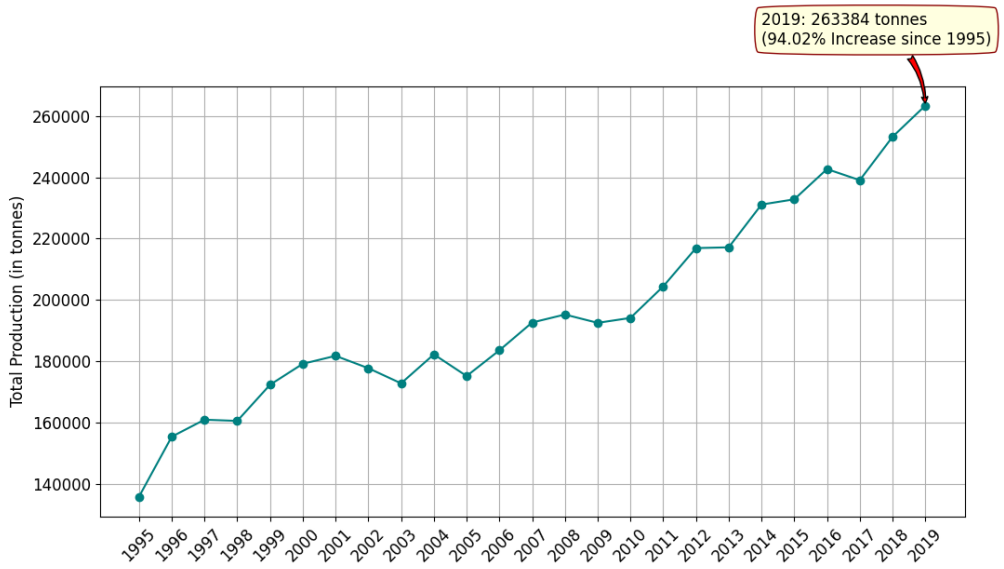

Figura 1: Total Coffee Production from 1995 to 2019

This graph shows data relating to coffee exports from the main producing countries. However, it is important to recognize that behind these numbers there is a more complex reality regarding the environment and its forests. Countries like Brazil and Colombia, which dominate the chart with the highest export volumes, are also known for their vast forests. For example, Brazil is home to a significant portion of the Amazon Rainforest, often described as the "lungs of the Earth" due to its crucial role in regulating the

global climate and absorbing CO2. In Vietnam, we find forests like that of the Mek, which is another vital ecosystem. The growing global demand for coffee has led to the conversion of forests into agricultural land to cultivate this precious resource. This practice can have deleterious effects on the environment, including loss of biodiversity, alterations to hydrological patterns, and release of stored carbon, thus contributing to climate change.

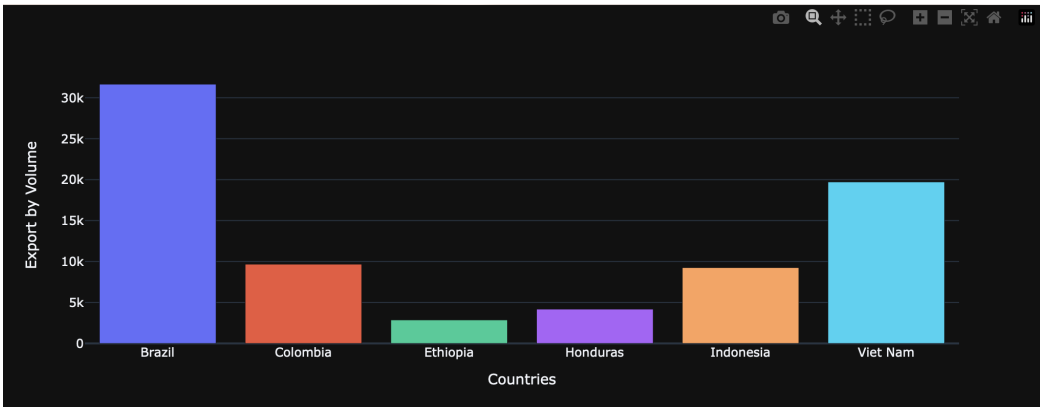

Figura 2: Coffee export for the highest producing countries worldwide until 2013

This graph shows data relating to coffee exports from the main producing countries. However, it is important to recognize that behind these numbers there is a more complex reality regarding the environment and its forests. Countries like Brazil and Colombia, which dominate the chart with the highest export volumes, are also known for their vast forests. For example, Brazil is home to a significant portion of the Amazon Rainforest, often described as the "lungs of the Earth" due to its crucial role in regulating the global climate and absorbing CO2. In Vietnam, we find forests like that of the Mek, which is another vital ecosystem. The relationship between coffee production and deforestation is complex. The growing global demand for coffee may lead to the conversion of forests into agricultural land to cultivate this valuable resource. This practice can have deleterious effects on the environment, including loss of biodiversity, alteration of hydrological patterns and release of stored carbon, thus contributing to climate change.

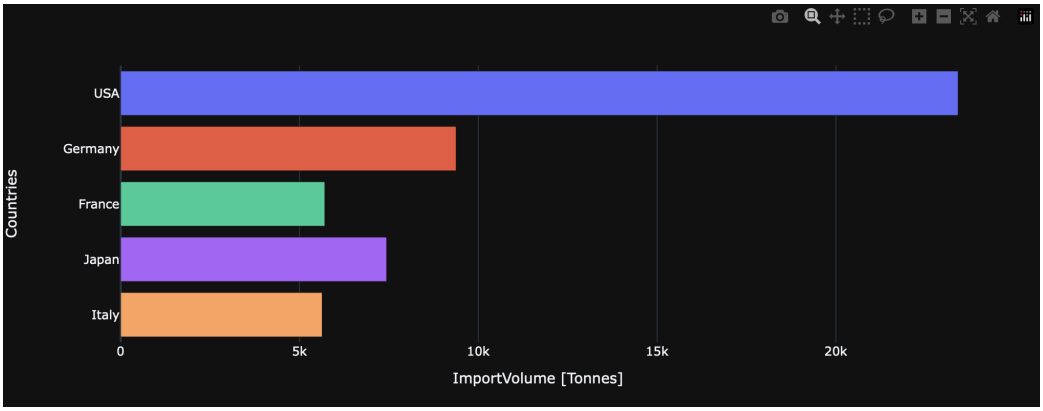

Figura 3: Top 5 coffee importing countries in time to 2013

The largest importers of coffee are industrialised countries such as the USA, Germany, France, Japan and Italy. This fact raises fundamental questions about the balance of economic power and how global goods such as coffee are traded and consumed. First, one might observe a certain irony in the fact that while producing countries face direct challenges related to coffee production, such as deforestation and labour exploitation, industrialised countries enjoy the benefits in the form of consumption and corporate profits. These countries often have control over the distribution and marketing networks, thus influencing the final price of coffee and securing a disproportionately large share of the profit generated by the coffee industry, leaving a very small part to the producersFurthermore, the demand for coffee in industrialised countries has created a 'coffee culture' that emphasises speciality and high-quality drinks. This can lead to a disconnect between consumers and the origins of the product, with little attention paid to the conditions under which coffee is grown and harvested. This disconnect can contribute to indifference towards the environmental and social impacts of coffee production in developing countries.

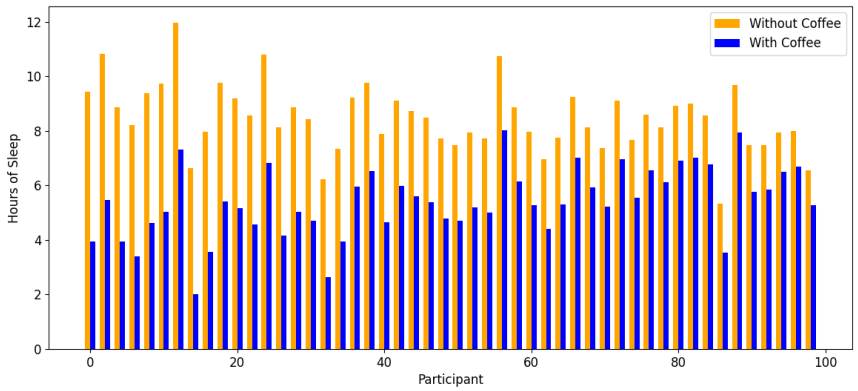

Figura 4: Sleep difference with coffe and without coffee

This graph reports the results of a study in which regular coffee consumers were asked to abstain from coffee for a certain period. Their sleep was monitored every night by calculating how many hours they got. Sleep monitoring was also done when the subjects consumed coffee so that the results could be compared. This graph shows 50 participants of the study and it is clearly seen that generally all the participants who consumed coffee slept much more. In the graph you can see a pair of bars that refer to the same participant while he drank the coffee and while he didn't drink it. A similar result was obtained with all other participants.

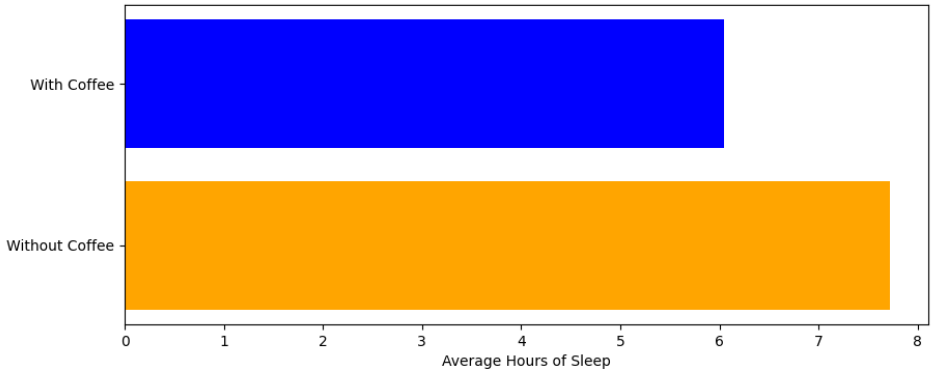

Figura 5: Comparison of Average Sleep Duration

Here we can see the results of the study on a general scale and it is clear that when you don't consume coffee you sleep much more on average. Obviously this can also depend on the type of person but on average it is like this.

5 Interface design

Our interface is very simple in that our site consists of a single page and the topics are displayed in sequence so that the user can read and interpret the charts clearly. In addition, some graphs are interactive and allow the user to stop at different points according to their interest. For each graph, there is a description that allows the user to enter deeper into the meaning of the graph.

6 Next steps

For the future, it would be useful to add more insights. In this way, more information can be obtained by gaining a much deeper insight into the topic. It would also be useful to find a way to amplify the target audience so that more and more people become aware of the topic.

References

1. PubMed documentation, `https://pubmed.ncbi.nlm.nih.gov/`, (15.01.2024).

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3. Setuptool Documentation, `https://setuptools.pypa.io/en/latest/`, (15.01.2024).