Coffee Yield Analysis: Effects of Rainfall and Temperature

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Date: 27/08/2025

Abstract

This project investigates the effect of rainfall and temperature on coffee yield in a coffee estate. By analyzing sample data, it was observed that higher rainfall and moderate-high temperatures correlate with increased coffee production. The results provide insight into how environmental factors influence coffee cultivation and can aid in planning optimal production strategies.

1. Introduction / Background

Coffee growth is influenced by several environmental factors, with **rainfall and temperature** being two of the most significant. Understanding the relationship between these factors and yield can help estates optimize cultivation practices and improve production efficiency.

Aim: To study how rainfall and temperature affect coffee yield in a coffee estate and identify patterns that influence productivity.

2. Methodology

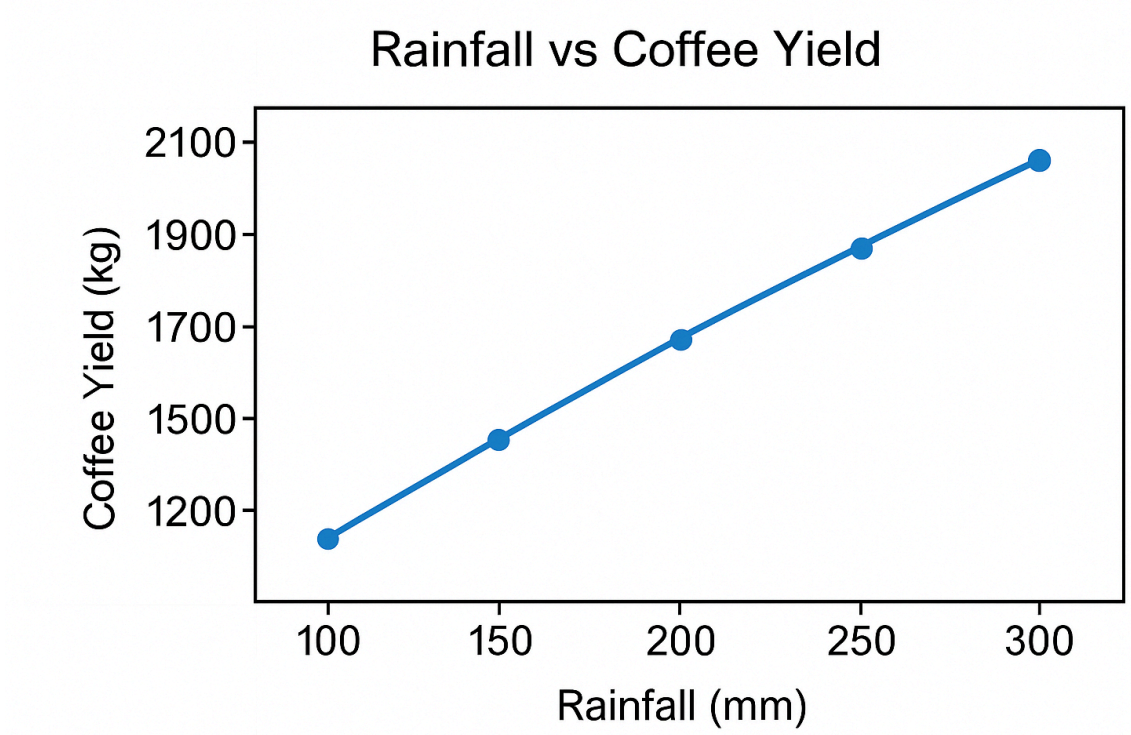
- Collected sample data on rainfall (mm), temperature (°C), and coffee yield (kg).
- Analyzed trends using line and bar charts.
- Observed correlations between environmental factors and coffee yield.
- Tools used: Google Docs for calculations and chart plotting.

3. Data Table

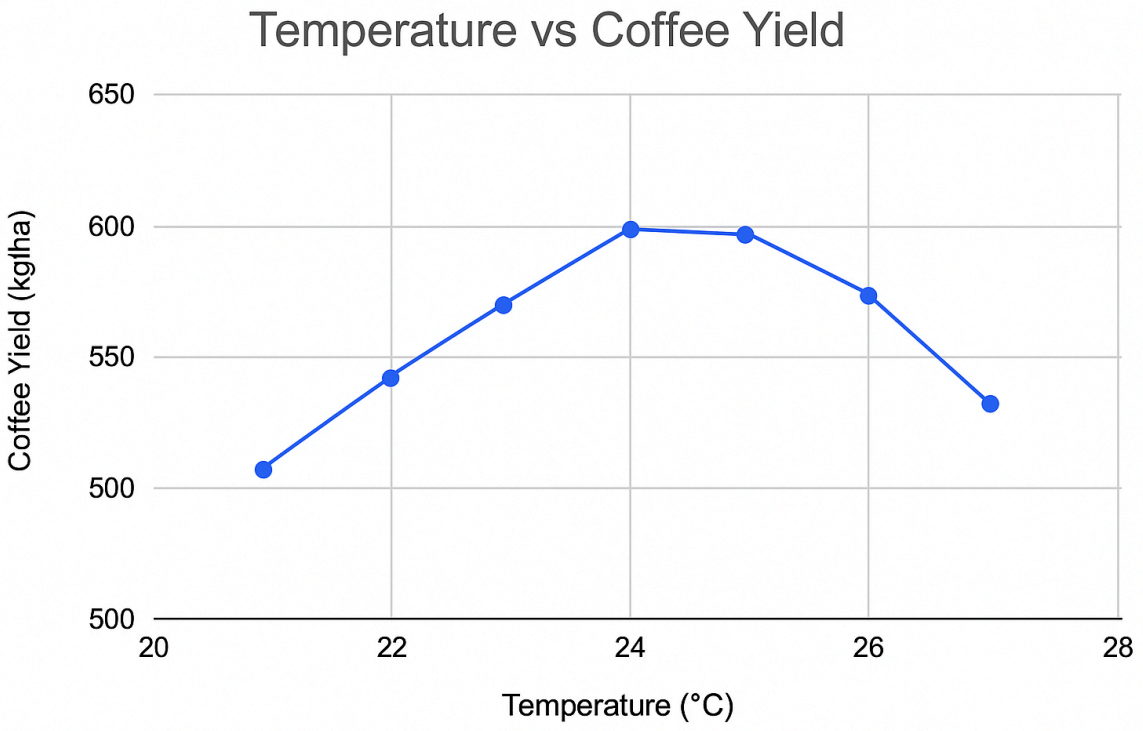
Rainfall (mm)	Temperature (°C)	Coffee Yield (kg)
100	22	1200
150	23	1500
200	24	1700
250	25	1900
300	26	2100

4. Charts / Graphs

- **Graph 1:** Rainfall vs Coffee Yield



- **Graph 2:** Temperature vs Coffee Yield



Both graphs show a positive trend, indicating that higher rainfall and temperatures within this range increase coffee yield.

5. Observations / Analysis

- Coffee yield increases from **1200 kg** at 100 mm rainfall to **2100 kg** at 300 mm rainfall.
- Temperature increases from **22°C to 26°C**, with a corresponding increase in yield.
- Approximate quantitative insight: Coffee yield increases by ~200 kg for every 50 mm increase in rainfall and by ~200 kg for every 1°C increase in temperature.
- Both rainfall and temperature are positively correlated with coffee yield.

6. Conclusion

- Coffee yield is positively influenced by rainfall and moderate-high temperatures.

- Estates with higher rainfall and suitable temperatures are likely to produce more coffee.

- Understanding these factors aids in planning coffee cultivation and optimizing production strategies.

Future Work:

- Expand dataset to include multiple estates and years.

- Include other factors such as soil type, fertilizer use, or pest control.

7. References / Acknowledgment

- Data source: `coffee_estate.csv` file provided for the project

- Tools used: Google Docs, simple calculations, line/bar charts