

# CLIMATE CHANGE AND COFFEE PRODUCTION IN THE AMAZON

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# INTRODUCTION

- The Amazon region is fragile and vital to the environmental balance of South America.
- The temperatures and precipitation of the Amazon region create a favorable climate for the cultivation of high-quality coffee beans.
- The forest also creates an environment conducive for coffee production in agroforestry systems (AFS).



# INTRODUCTION

- Agroforestry systems are systems that combine coffee cultivation with trees and other plants.
- This approach aims to improve the sustainability of production, promote environmental preservation, and offer benefits for both farmers and the environment (Environmental Services).





# THE PROBLEM

The increase in average temperatures, the changes in rainfall patterns, and the greater frequency of extreme weather events are factors that can have a negative impact on the Amazon ecosystem, and have a direct impact on the quality and sustainability of coffee production in the region.



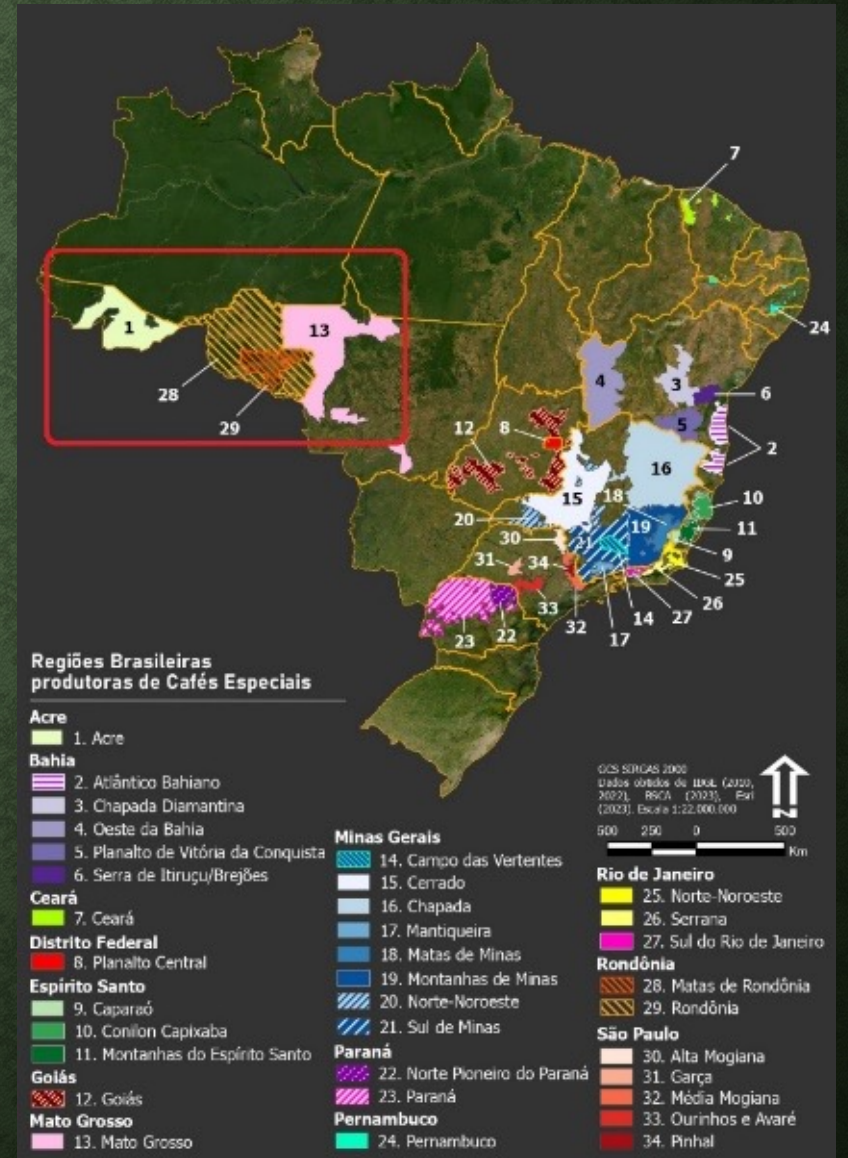
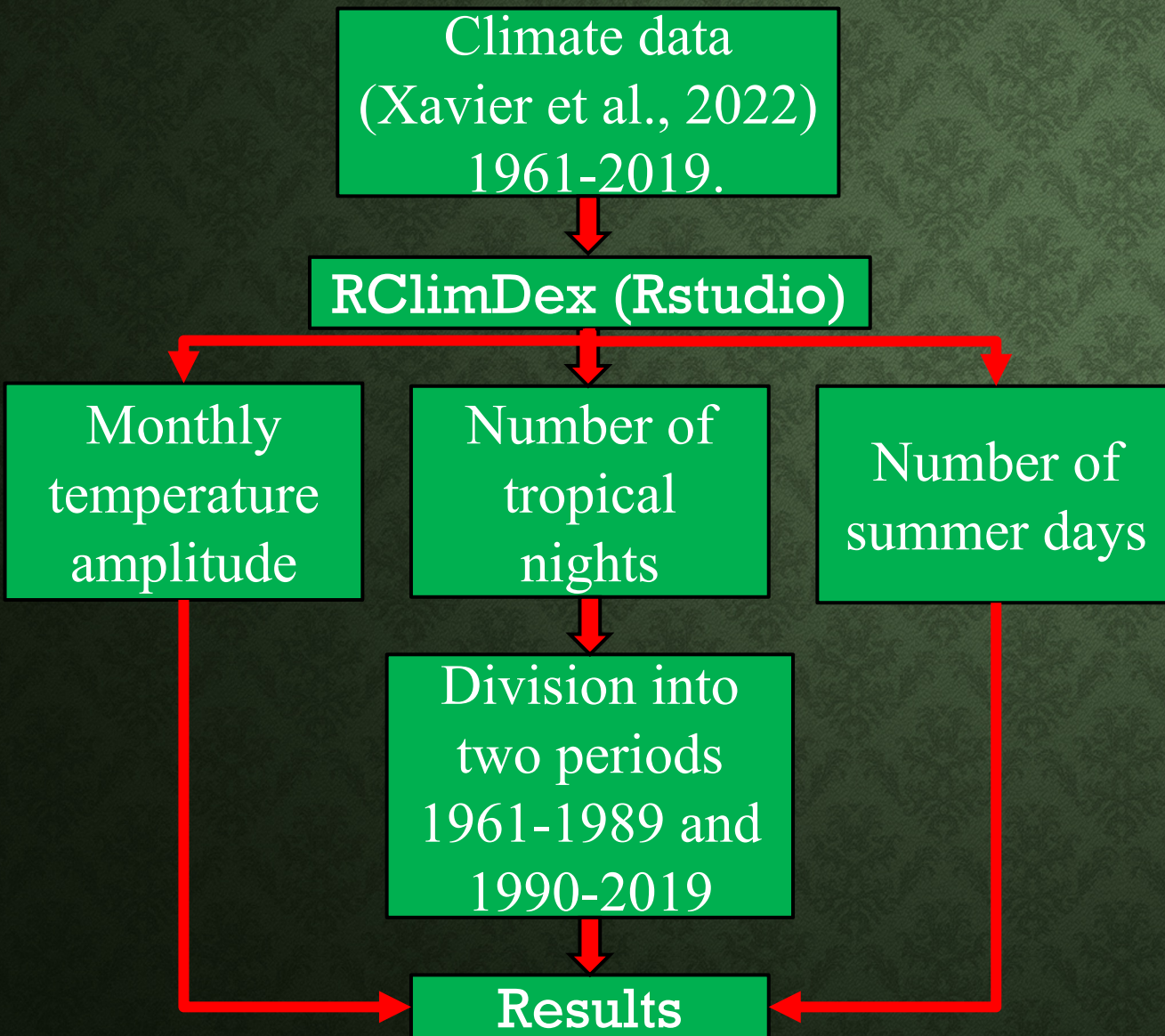


# RESEARCH OBJECTIVES

- Understand how the climate has changed over the last 30 years in the study areas.
- Infer how climate change may affect the production of specialty coffees in the Amazon region.
- Consider sustainable coffee production alternatives that preserve Amazonian biodiversity.



# MATERIALS AND METHODS





# RESULTS

## Monthly temperature amplitude (DTR)

- Increasing trend for all regions studied.
- July/August/September (winter) had highest thermal amplitudes (13.88° C).
- December/January/February (summer) had lowest thermal variation (9.79° C).

Average monthly temperature range for the period, from 1961 to 2019.

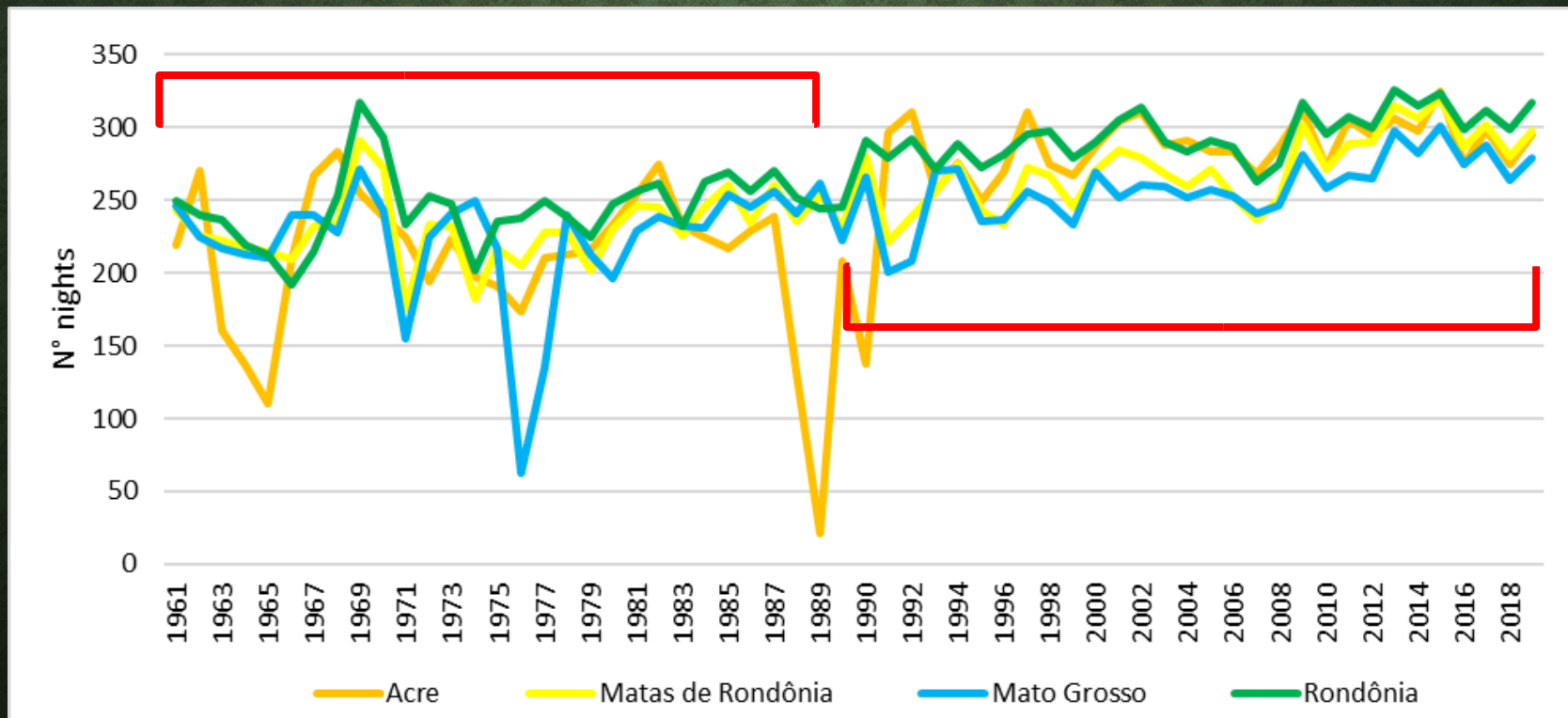
	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec
Acre	9.10	9.12	9.24	9.53	10.00	11.29	12.94	13.58	12.59	11.14	10.00	9.28
Matas de Rondônia	9.11	9.08	9.39	9.80	10.64	12.46	14.34	14.87	13.04	11.49	10.20	9.38
Mato Grosso	9.33	9.40	9.67	10.24	11.30	13.34	15.23	15.70	13.43	11.71	10.39	9.55
Rondônia	9.07	9.03	9.27	9.56	10.24	11.92	13.81	14.37	12.75	11.31	10.09	9.34
	9.00 to 10.99			11.00 to 12.99			13.00 to 14.99			15.00 to ...		



# RESULTS

## Number of tropical nights (TR)

- Showed an increasing trend from 1961-1989 (n=226) as well as from 1990-2019 (n=277) in all regions studied.

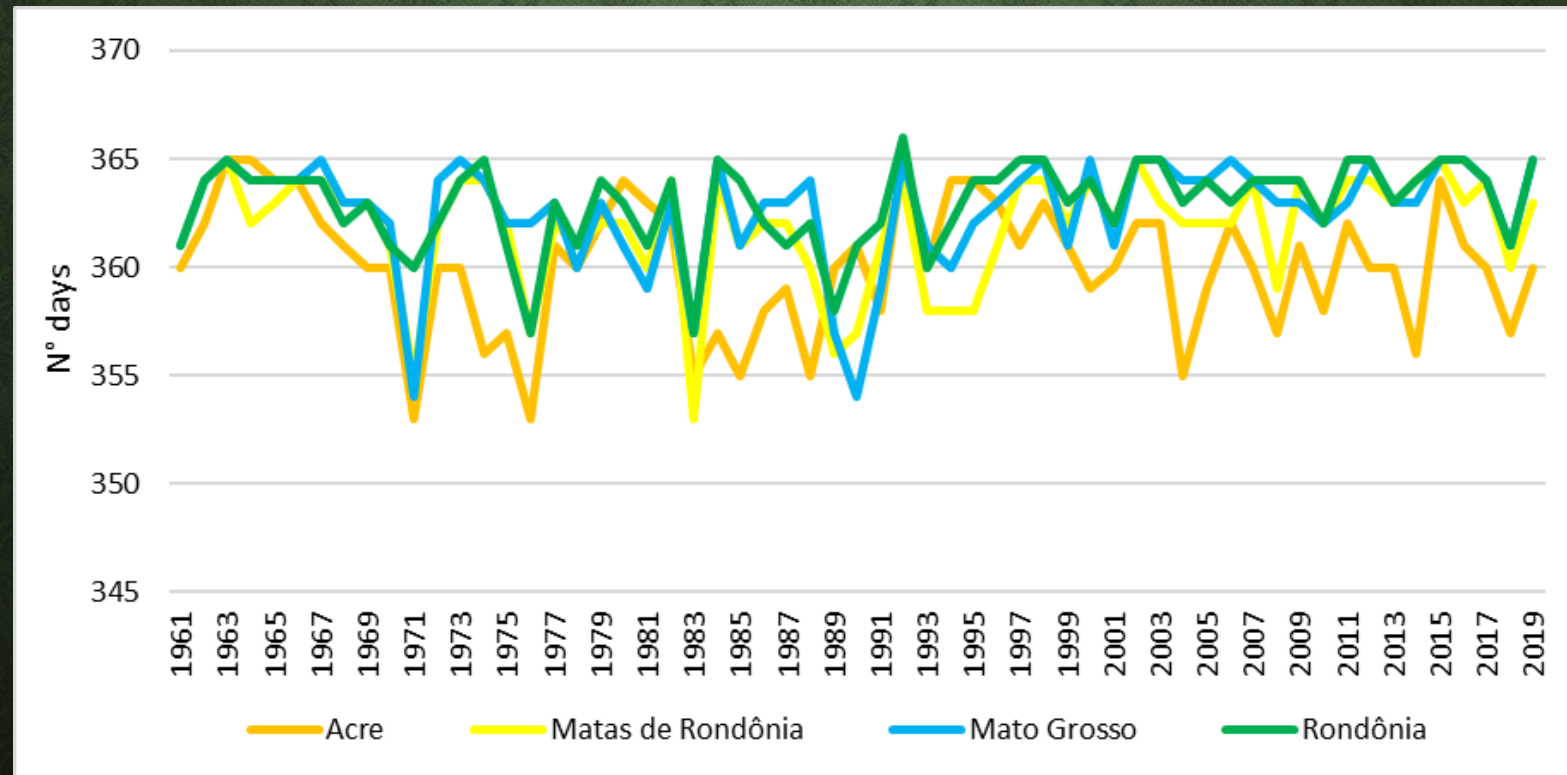




# RESULTS

## Number of summer days index (SU)

- All regions showed an increasing trend in the number of summer days.
- Increased for days with temperatures equal to or greater than 30° C.





# DISCUSSION

- The identified changes require from coffee producers in the Amazon the need to adopt resilient agricultural practices.
- These changes can negatively affect the balance of the forest ecosystem and the quality of coffee produced in the Brazilian Amazon regions. To enhance resilience and preservation, agroforestry systems can be employed.
- The challenge is to find a balance between the preservation of Amazonian biodiversity with the production of specialty coffees. The expansion of AFS aid in increasing resilience and preserving the forest.



# CONCLUSION

- Thermal amplitudes are greater in winter compared to summer.
- Temperature is increasing, with more summer days and hotter summer nights.
- New temperature patterns in the Amazon could impact coffee production.
- Preserving the rainforest and ensuring sustainable coffee production is essential for the sustainability of all of the Amazon region.





# JE VOUS REMERCIE DE VOTRE ATTENTION



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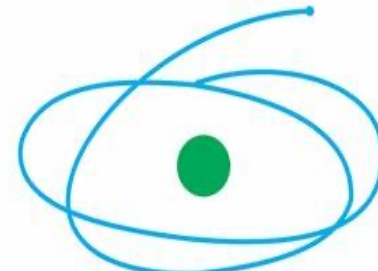
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