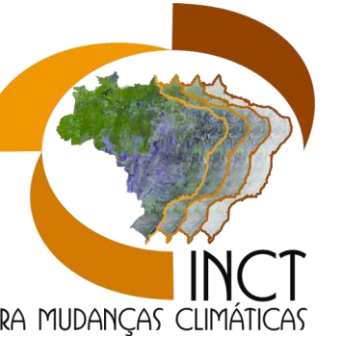


Kelly Ribeiro¹, Eráclito Rodrigues de Sousa-Neto¹, Paulo José Duarte-Neto², Jean Pierre Henry Balbaud Ometto¹, Rômulo Simões César Menezes², José Willian Ferreira¹

¹Earth System Science Center (CCST) – National Institute for Space Research (INPE)– São José dos Campos-SP, Brazil,

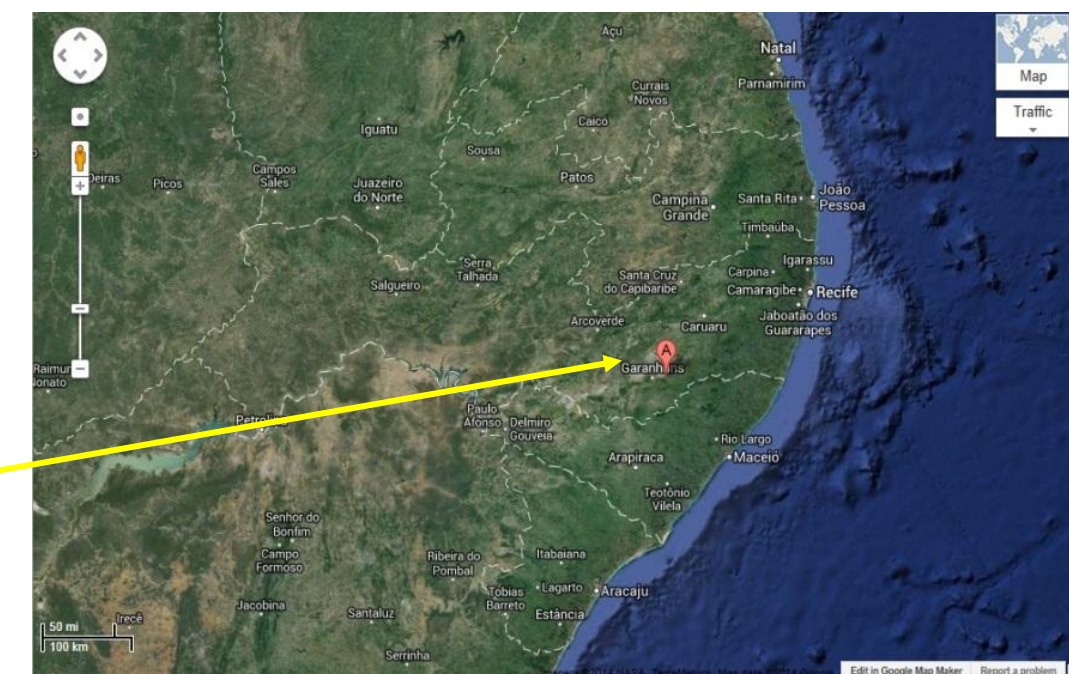
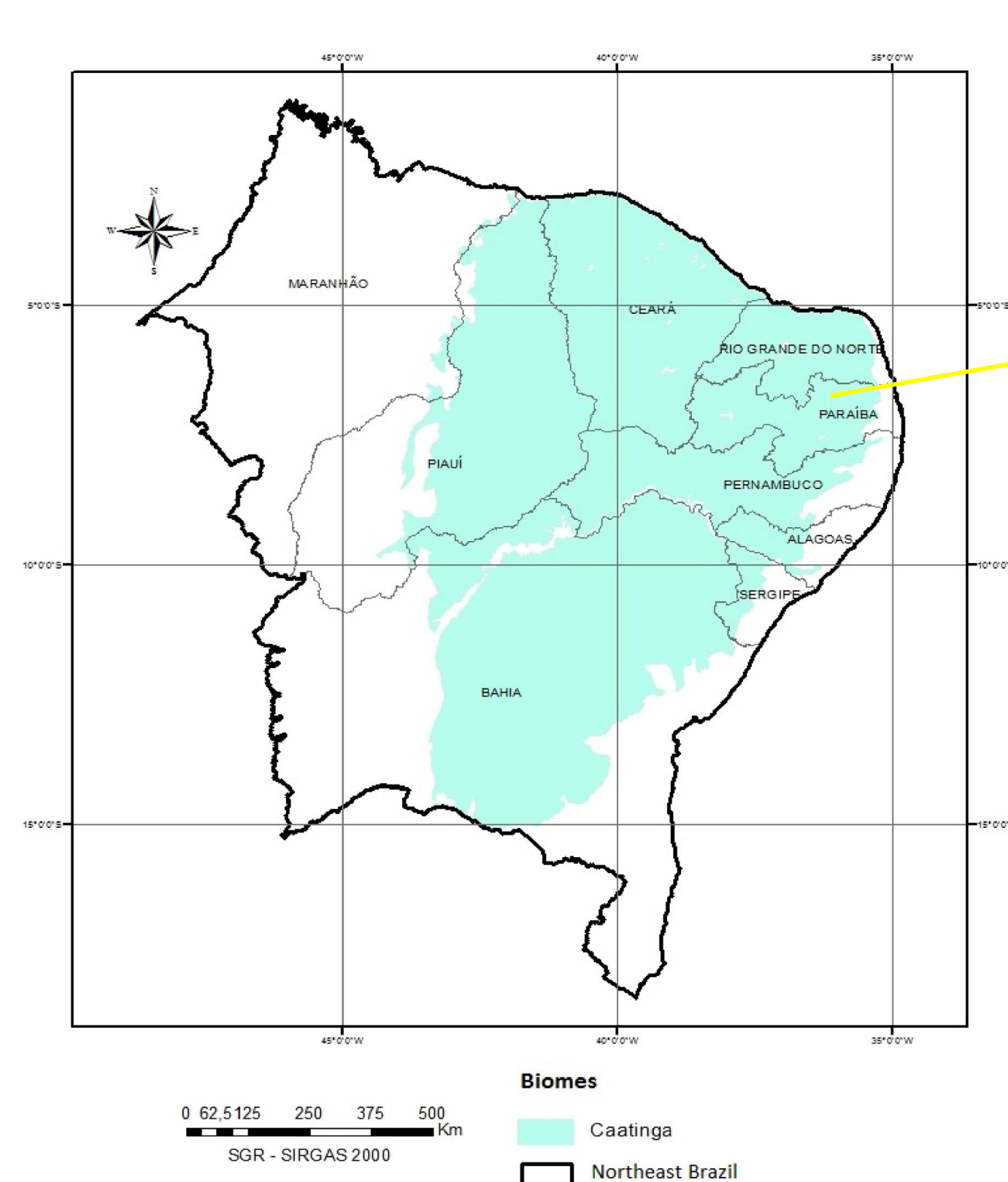
²Federal University of Pernambuco (UFPE)- Recife-PE, Brazil



Goals: The study aims to assess the changes in the fluxes of the nitrous oxide (N₂O) due to land use and land cover changes (LUCC) in the Brazilian semi-arid region during dry and rainy seasons in 2013 and 2014.

Introduction

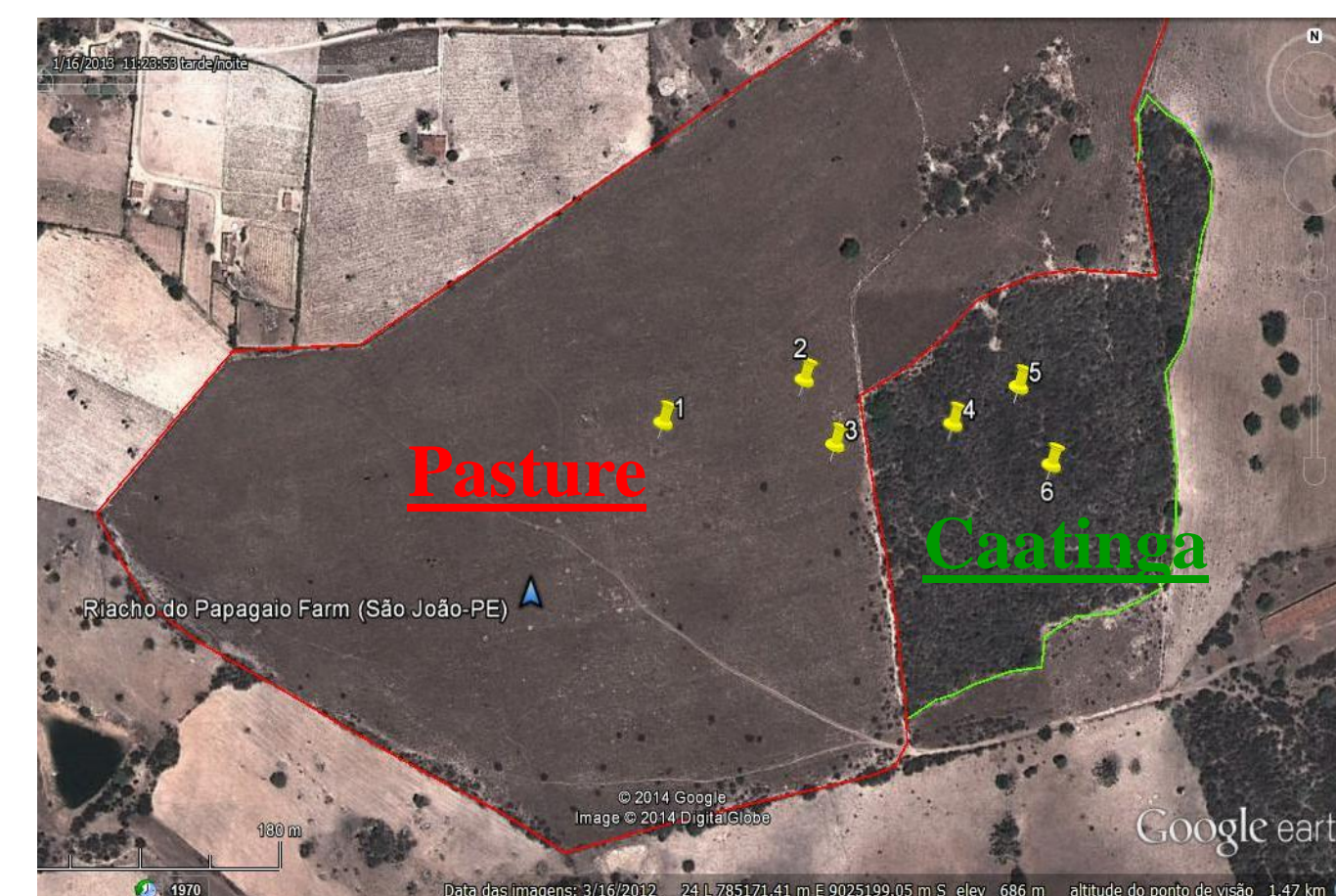
- The Caatinga biome is located in the Brazilian semiarid region, and it is an exclusively Brazilian biome;
- It occupies an area of 850 mil km² (11,4% of the country);
- About 22 million people live in the region, of whom 12 million suffer from drought;
- One of the poorest and least developed regions of the country;
- Among the environmental problems prolonged drought are the most striking.



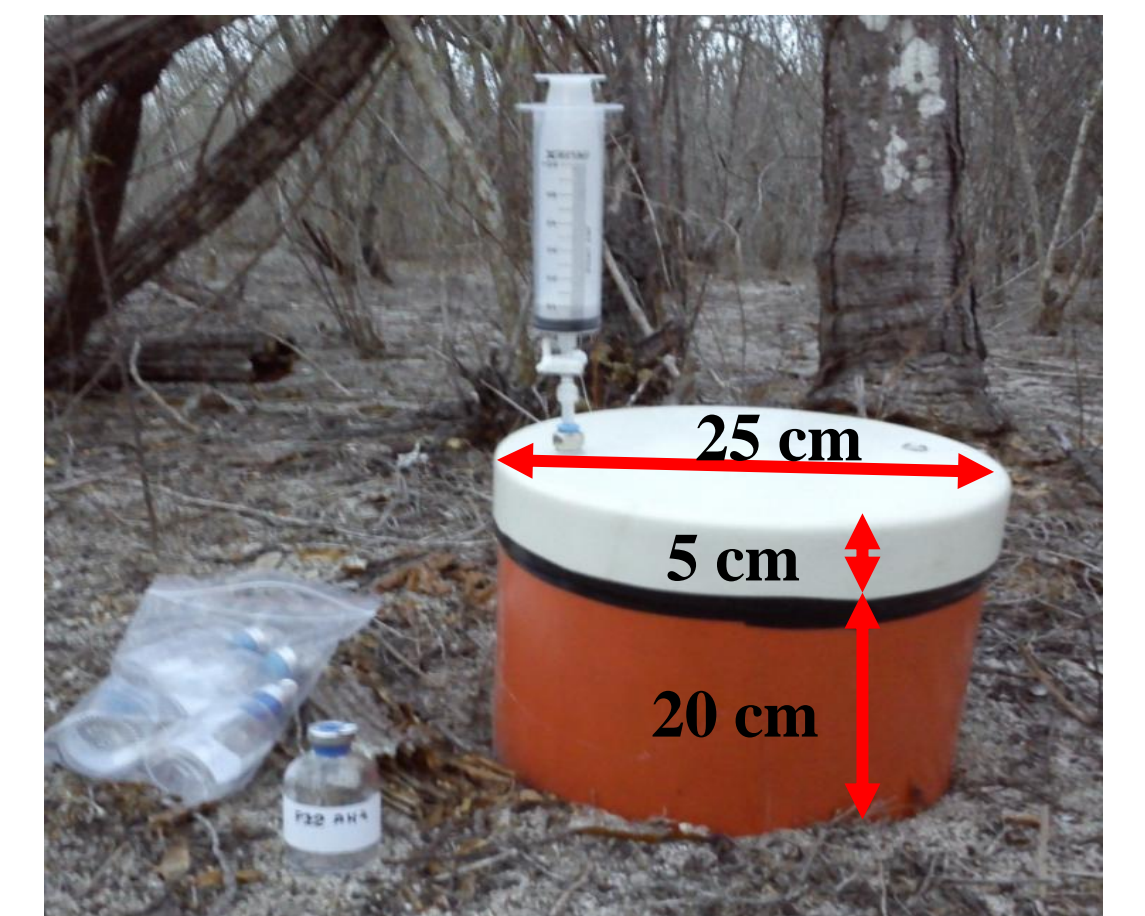
- Livestock as the main activity of the rural population and precursor of the systematic replacement of native vegetation by grazing areas and responsible for serious environmental problems such as loss of biodiversity and desertification
- The area of pasture in the biome extends over 293,756.4 km², representing 35.5% of the biome and 19.8% of the pasture area in Brazil

Methods

This experiment was conducted in the municipality of São João, in Pernambuco State. The region has warm, humid climate with average annual rainfall of 800mm. The soil is classified regolithic neosol characterized by sandy soils presenting high erodibility.



Aerial view of the Farm *Riacho do Papagaio*



Dry Season



Rainy Season

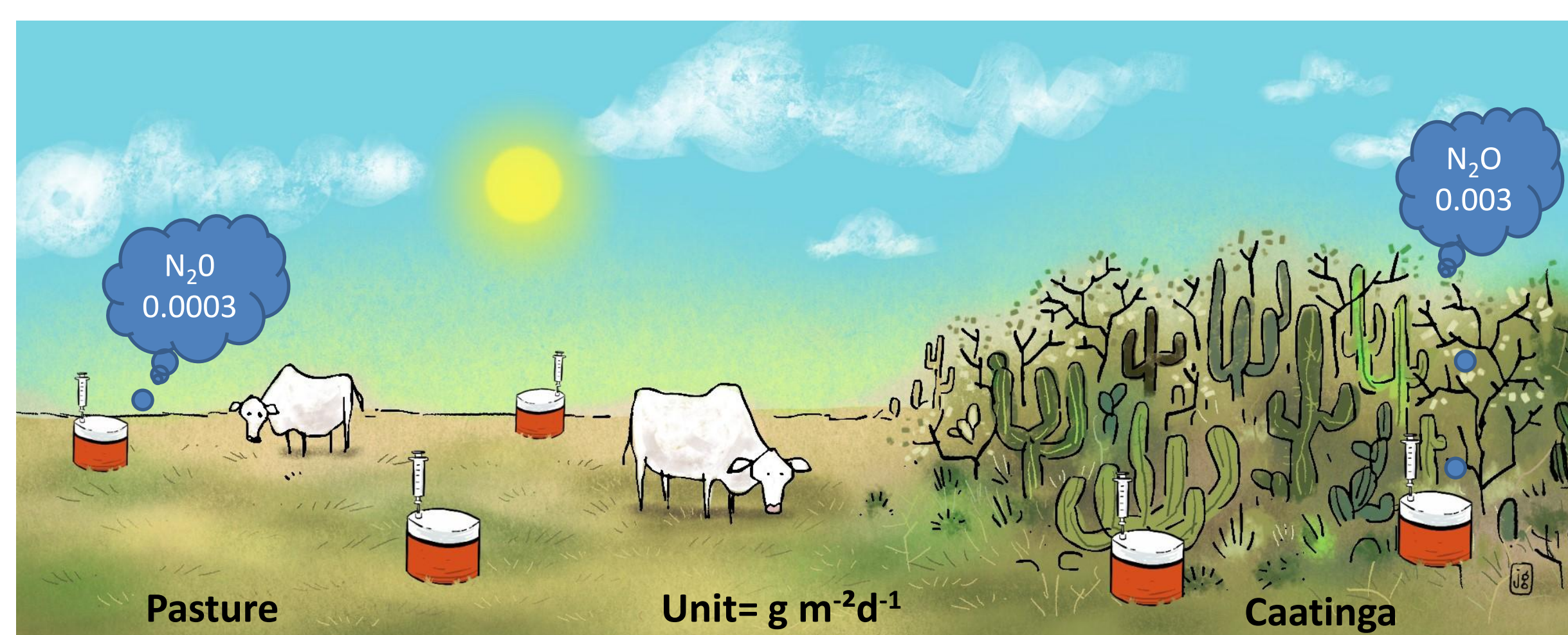


This experiment was set up to assess the impact of LUCC on GHG emissions in the Caatinga biome in two different soil covers: preserved Caatinga forest and pasture, distributed in 3 blocks (replicates)

Collections were made in 2013 and 2014, with two campaigns per year: one in the dry season (September – April) and the other in the rainy season (May to August).

The fluxes were measured using static PVC chambers in periods of 30 minutes.

Results



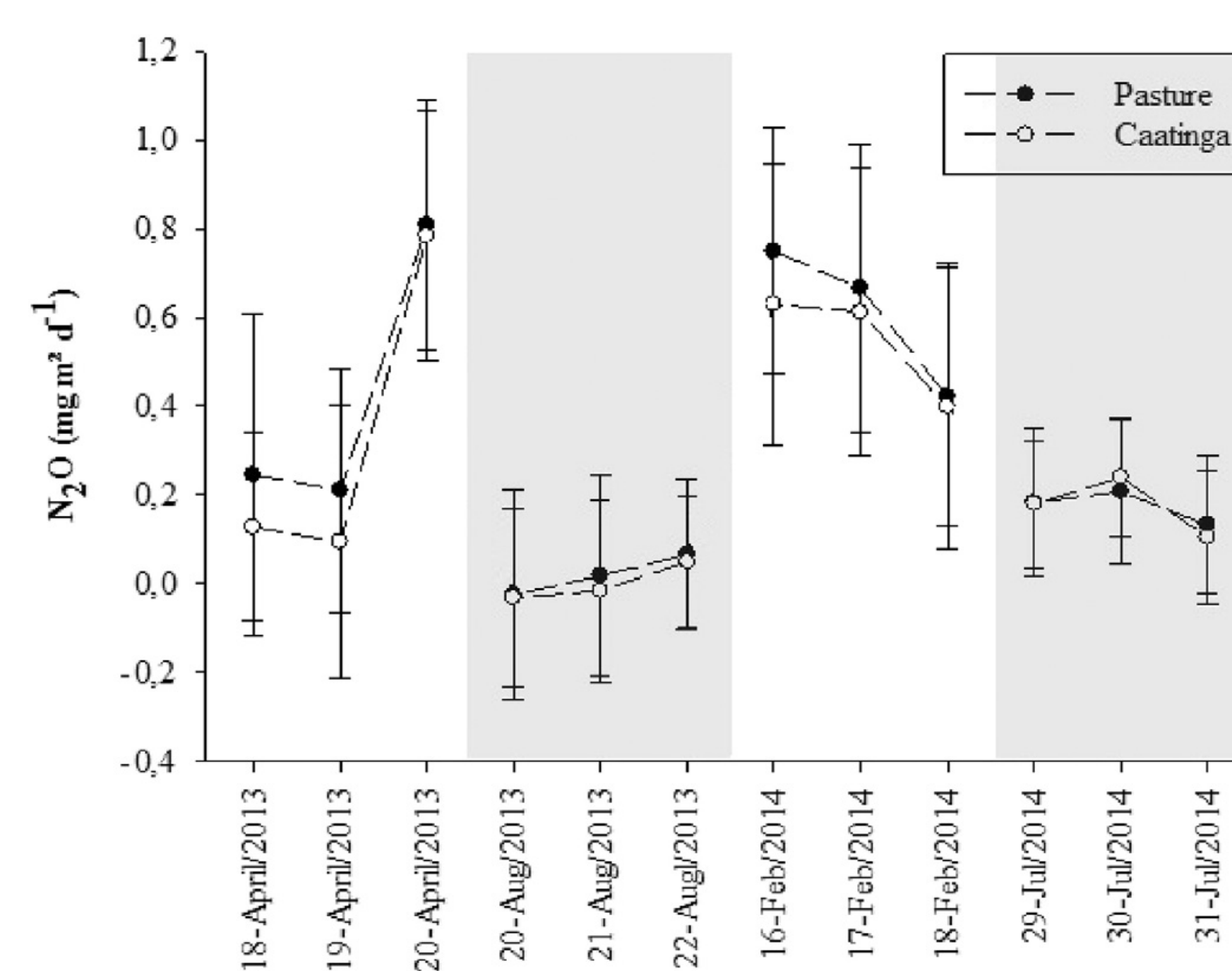
- Land use/cover changes have altered biogeochemical cycles in the Caatinga.

- Gaseous emissions correlated with soil temperature

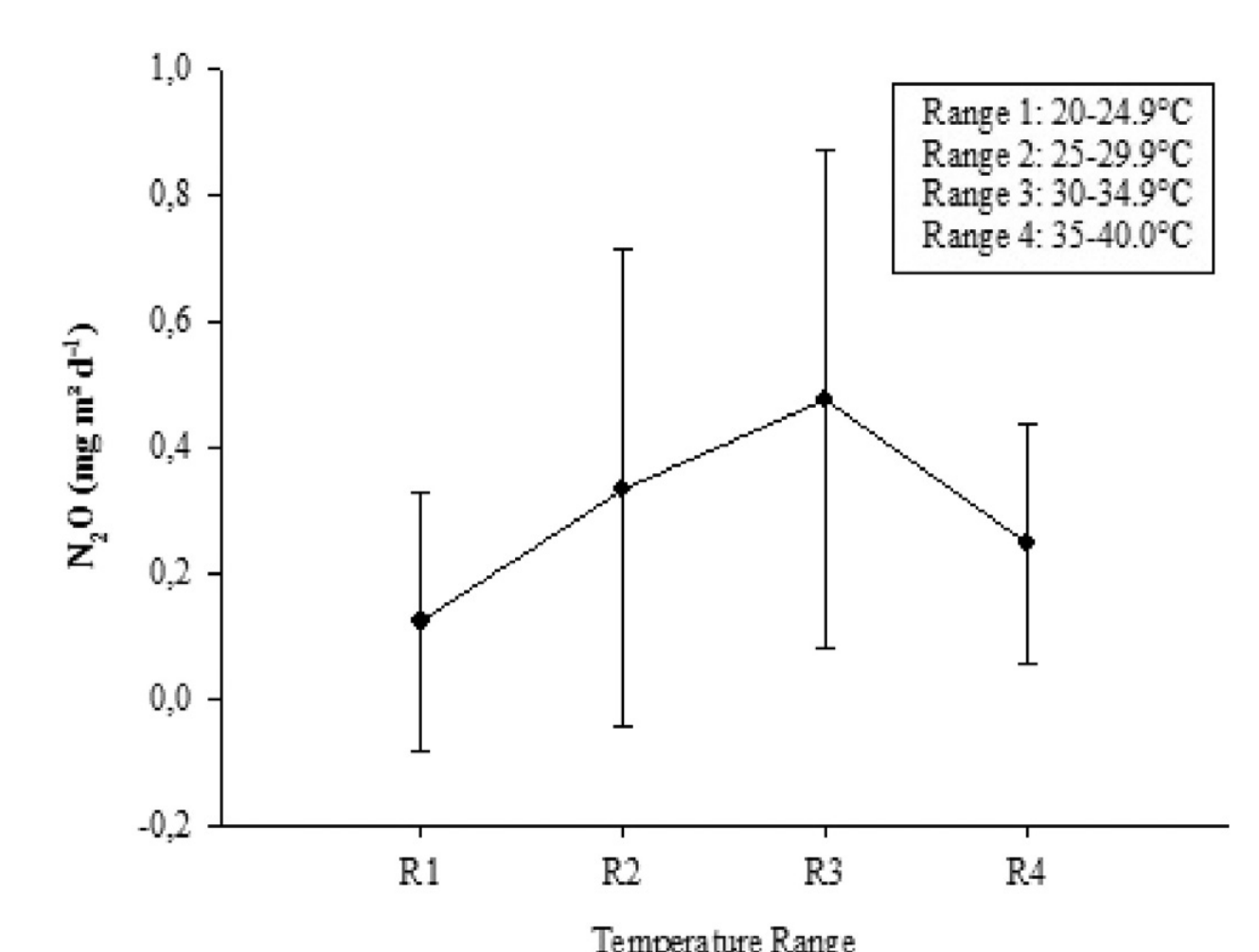
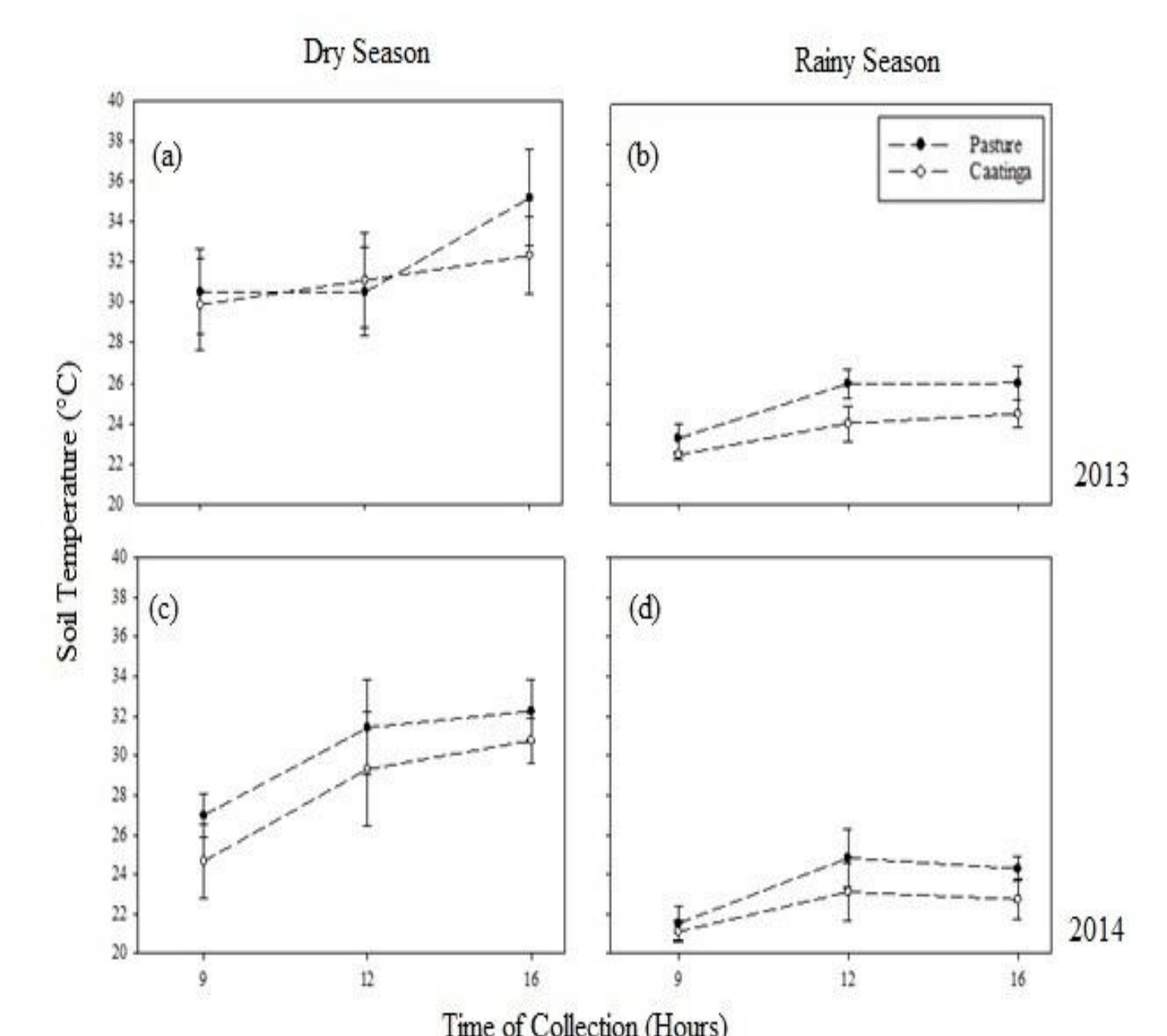
- There was no difference between emissions measured in native vegetation and pasture treatments

Nitrous oxide fluxes seemed to be influenced by different temperature ranges ($r = 0.36$; $P = 0.000$) In a range of temperatures from 30 °C to 34.9 °C (R3), emissions were significantly higher in the other temperature ranges ($P = 0.000$). Fluxes did not present significant correlation with soil moisture (not presented here).

In this study, soil cover did not significantly influence soil gas fluxes. Instead, soil fluxes were influenced by climatic and edaphic conditions. Our results show that N₂O fluxes were mostly positive, indicating emission of GHG from soil to atmosphere and that emissions vary with season



Nitrous oxide fluxes seemed to be influenced by different temperature ranges ($r = 0.36$; $P = 0.000$)



Conclusions

- Our findings show that changes in land cover are not the major drivers of significant emissions in the study site, and they showed the influence of edaphic conditions and climatic factors over soil gas production.

- The environmental variables (temperature and soil moisture) are important regulators in GHG; however, the climate and high rainfall variability inherent in the environment, associated with anthropogenic changes in the region hamper determining emissions trends for the biome.

Acknowledgments

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