Leibniz Centre for
**Agricultural Landscape Research**
(ZALF)

Land Use &
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# Towards understanding the wildfire dynamics and hot spots intensity in the central province of Cameroon: Contribution of Google Earth Engine (GEE) and spatial statistics analysis

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## Introduction

- In recent decades, the world is facing the degradation of its forest heritage (Bernhard et al., 2024).
- Countries in the Global South and Sub-Sahara Africa are experiencing the highest rate of deforestation and land degradation (AbdelRahman, 2023; Adam et al., 2023).
- Uncontrolled fires that spread through forests and grasslands generally caused by human actions damage ecosystems, wildlife, and human property.

## objectives

Contribute to understanding burned areas and current fire trends, assess their intensities and hot spots through their spatial and temporal dynamics in Yoko and Nanga-Eboko.

## Study area

- Yoko and Nanga-Eboko is situated in Cameroon between latitudes 4◦00′ and 6◦05′N, and longitudes 11◦30′ and 13◦30′E (Fig. 1)
- The study area dominated by forest and savannah mosaic, is subject to the recurrence of fires (Kana & Etouna, 2006b)
- It is a hotspot for forest decline, with significant environmental damage

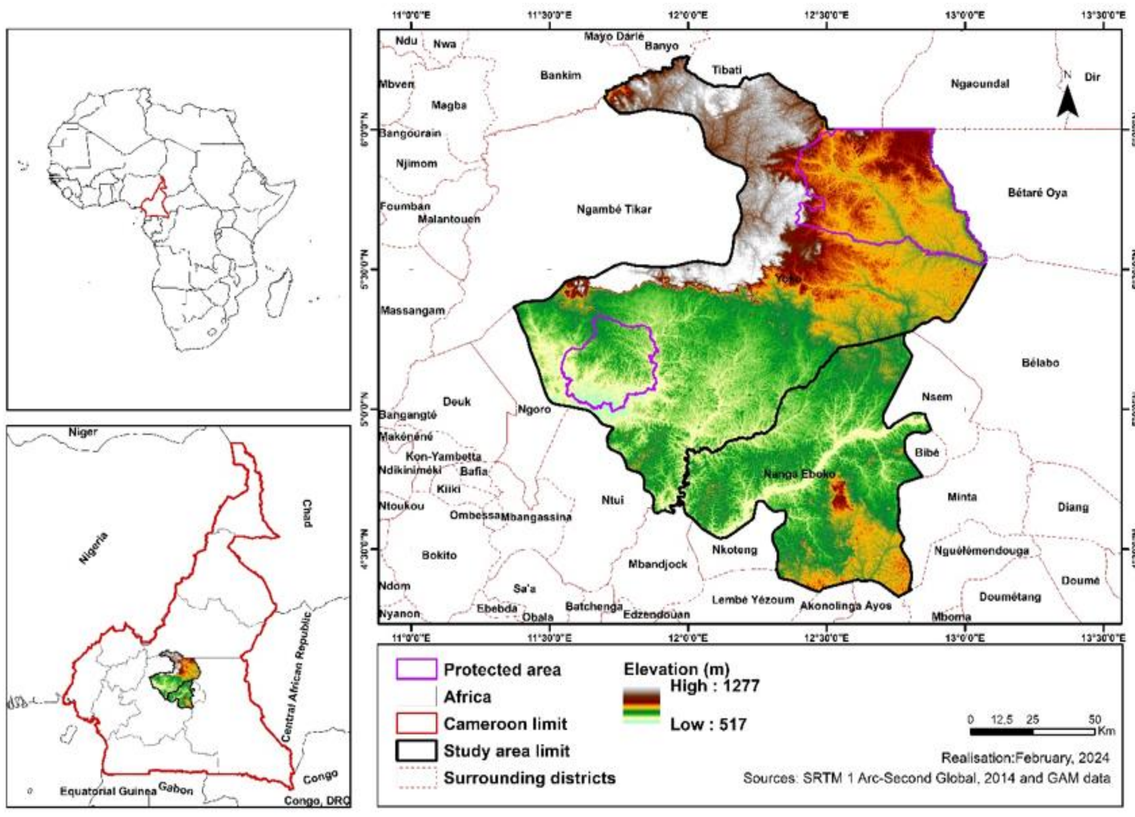


**Fig. 1. Study area location map**

## Conclusion

- The intensity of the fires in the area is high (large burned). The hot spots in the northwest and the centre correspond to the intensity of the burned areas
- The spread of fires is a function of agroecological, and anthropogenic realities.
- The trends are upward for burned areas and downward for active fires (2003-2023).

## References

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AbdelRahman, M. A. E. (2023). An overview of land degradation, desertification and sustainable land management using GIS and remote sensing applications. Rendiconti Lincei. Scienze Fisiche e Naturali, 34(3), 767–808. https://doi.org/10.1007/s12210-023-01155-3

Kana, C. E., & Etouna, J. E. (2006b). Apport de trois méthodes de détection des surfaces brûlées par imagerie Landsat ETM+: Application au contact forêt- savane du Cameroun. Cybergeo. https://doi.org/10.4000/cybergeo.2711

## Methods

- Wildfire data were possessed, using the Google Earth Engine (GEE) platform due to its ability to assist in processing big geospatial data.

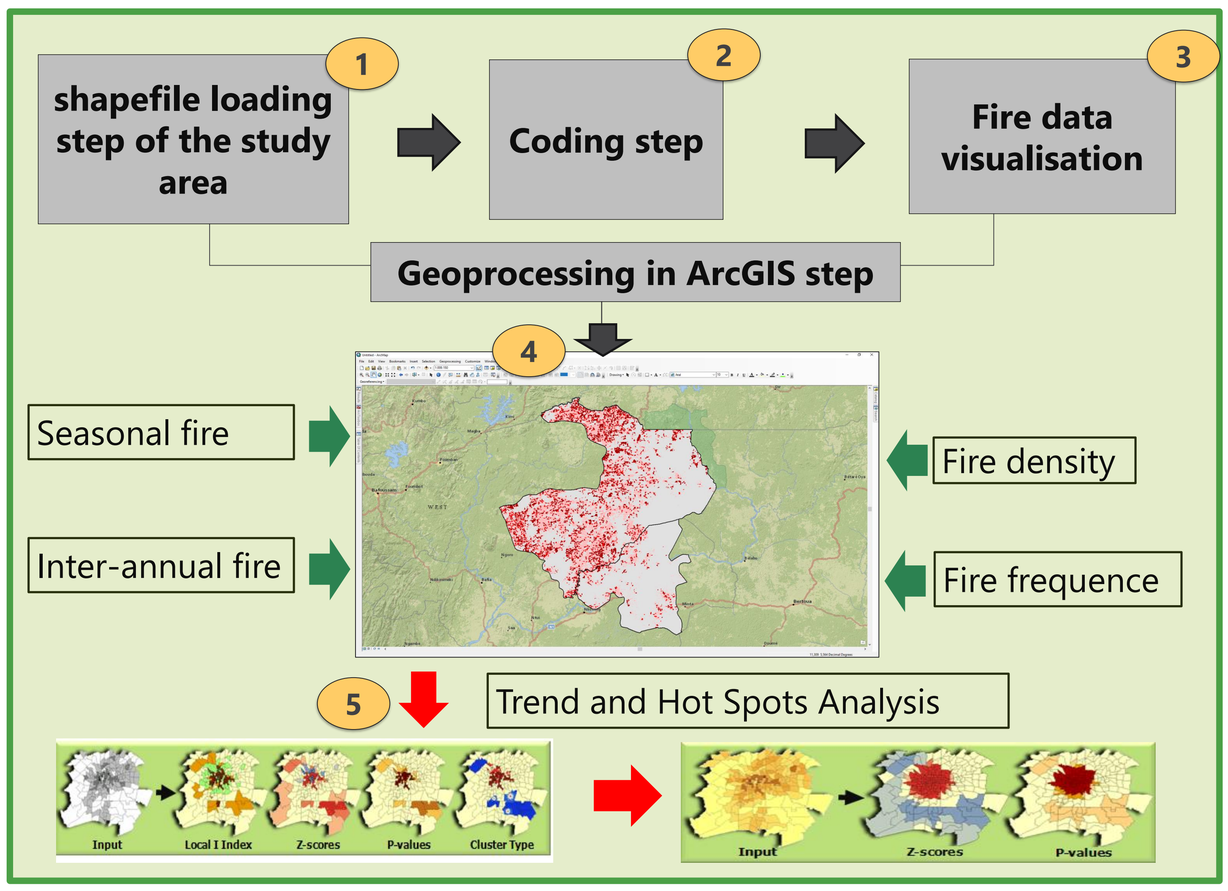


**Fig. 2. Fire data processing steps**

## Results

- Strong presence of fire intensities (49.5 ha to 2651.7 ha) with a density ranging from 0 to 10.89 active fires (n) per km2.
- The trend is upward for burned areas and slightly downward for active fires (Mann Kendall and Sen's Slop statistics test), while for anomalies, 3.5 ha and 2n (number of fire) more were observed
- November, December, October, February, and March are the most prone fire months.
- High intensity of fires with an average of 1629.70 ha burned monthly and 931.26 ha considering the entire data series (2003-2023). Hot spots and strong areas spatial correlation (Moran's I = 0.009081; Z-Score = 15.454067; and P < 0.001) are observed in areas with a high fire occurrence

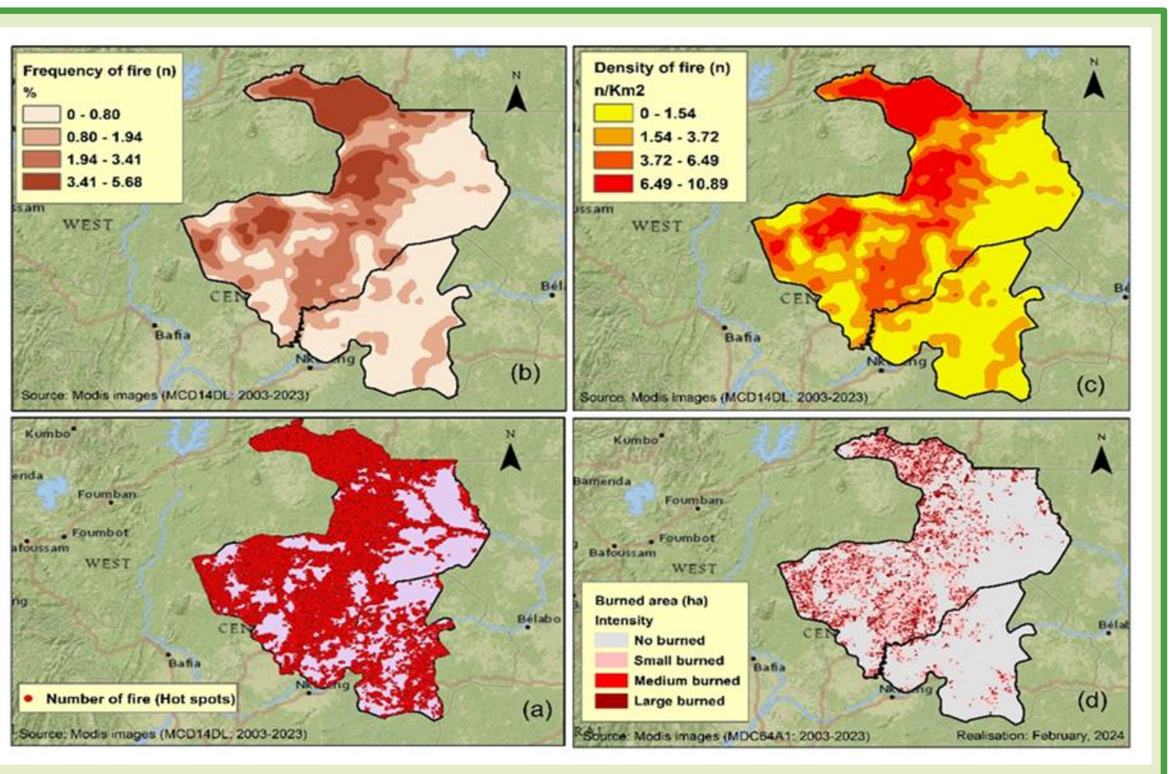


**Fig. 3. Fire maps**

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