CONTRIBUTION OF REMOTE SENSING TO THE ANALYSIS OF THE DRYING PROCESS OF LAKE TANMA UNDER STRONG CLIMATE VARIABILITY

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1. INTRODUCTION

- Climate change is placing increasing pressure on water resources worldwide.
- Major impacts: access to water, food security, and health.
- Vulnerability of lakes: significant decline in their surface area.
- In Africa, particularly in the Niayes region of Senegal, several lakes dried up as a result of the drought of the 1970s, including Lake Tanma, one of the largest lakes in the area, which was once a perennial body of water.
- Activities: agro-silvo-pastoral.
- **Objective**: The present study contributes to a better understanding of the drying process of Lake Tanma under climate variability conditions, using remote sensing techniques.

2. MATERIALS AND METHODS

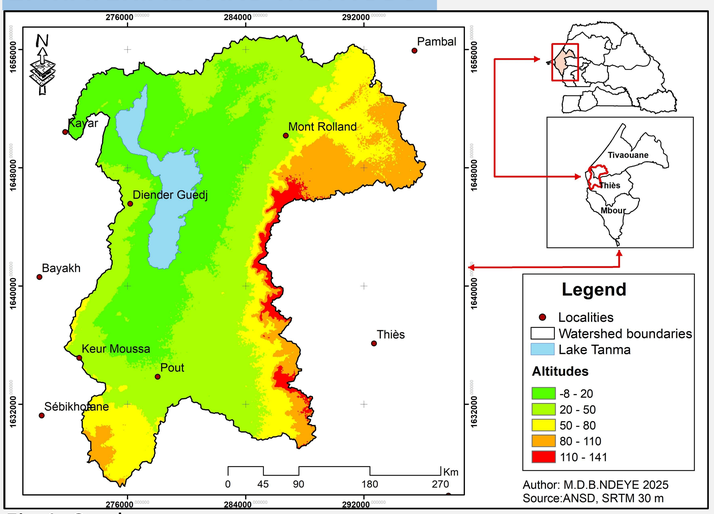

Fig.1: Study area

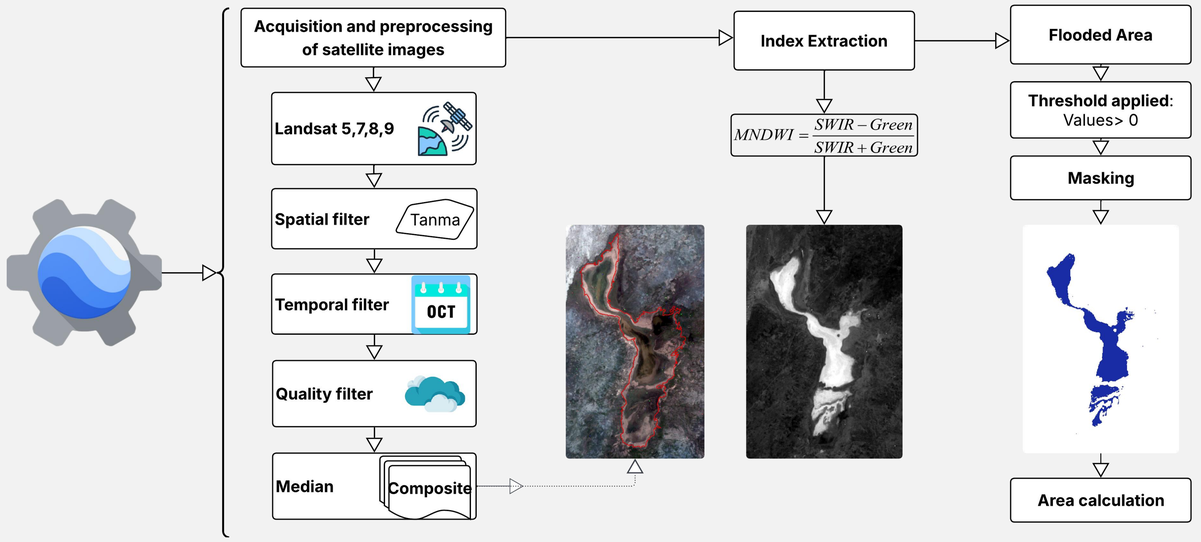

Tableau 1: Satellite images of Lake Tanma

Years	Source
1984, 1989, 2009, 2010	Landsat 5
2000	Landsat 7
2019, 2020	Landsat 8
2024	Landsat 9

3. RESULTS

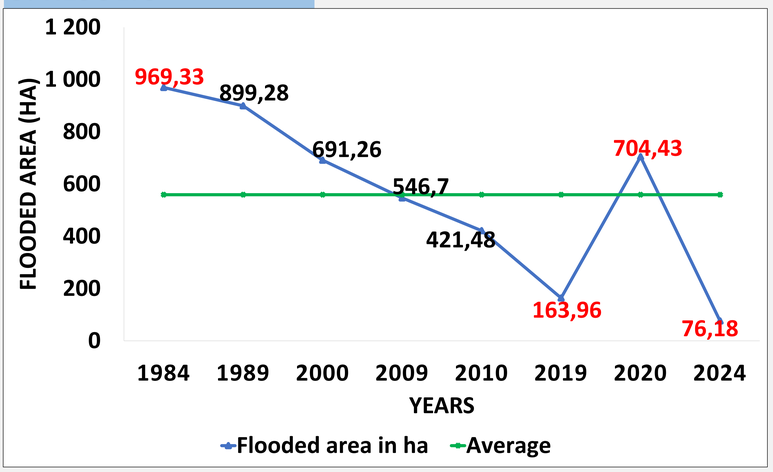

Fig.2: Intra-decadal variation in the flooded area of Lake Tanma

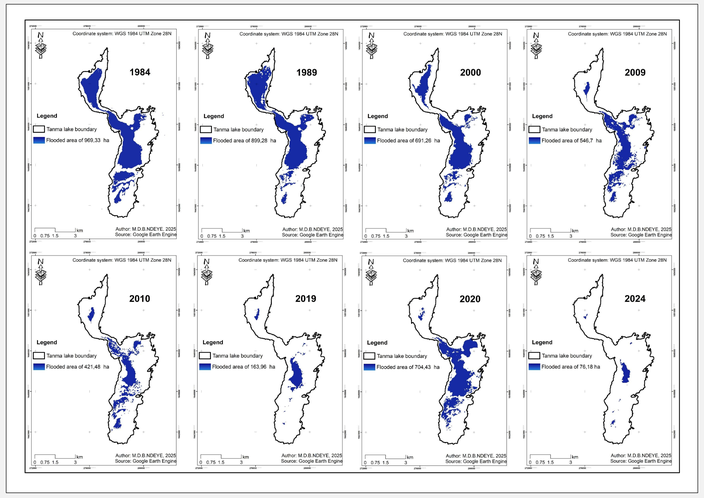

Fig.3: Decadal dynamics of the flooded area of Lake Tanma

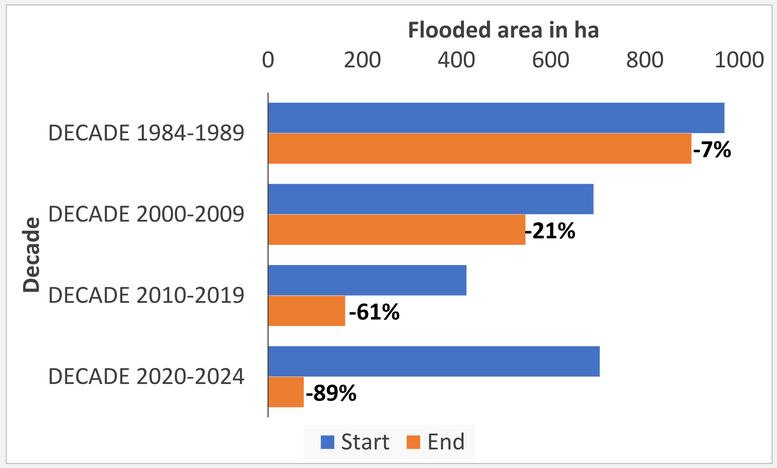

Fig.4: Change in the flooded area of Lake Tanma from year to year

4. CONCLUSION

- Study of the spatiotemporal dynamics of Lake Tanma's water surface area using satellite imagery from 1984 to 2024.
- Significant overall variation in water surface area: a 57.8% decrease from 969.33 ha in 1984 to 76.18 ha in 2024; average of 559.08 ha.
- Non-linear evolution with significant fluctuations, notably a peak of 704.43 ha in 2020..
- Variability by period: 7% from 1984–1989, 21% from 2000–2009, 61% from 2010–2019, and 89% from 2020–2024.
- A study of hydro-climatic parameters (rainfall, temperature, evapotranspiration) is needed to determine the lake's drying-up process.

5. REFERENCES

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