Raising adaptive capacities through agrometeorological learning – lessons from Burkina Faso and Senegal

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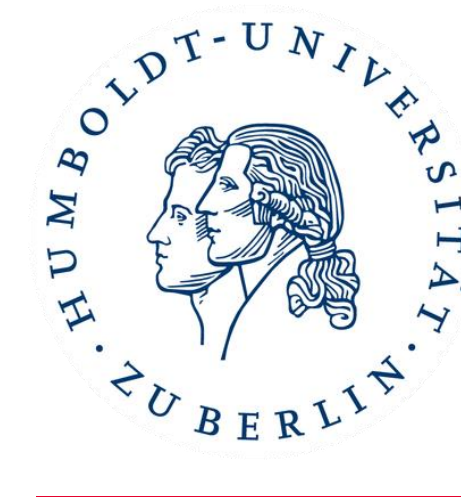
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## 1. Introduction: Objectives

Considering the increasing food insecurity and undernourishment through climate change in the semi-arid climatic zones of Burkina Faso and Senegal, enhancing agricultural resilience is crucial (FAO 2023; Röhrig et al. 2021; Tomalka et al. 2022). Insofar, this work package of the NUTRiGREEN project aims to:

- Empower farmers with tools for informed decision-making: local weather observation and agrometeorological learning.
- Gather local weather data and relate it to long-term averages.
- Examine the feasibility and impact of such initiatives in Senegal and Burkina Faso.

Undernourishment in Project Countries


Food Insecurity in Project Countries
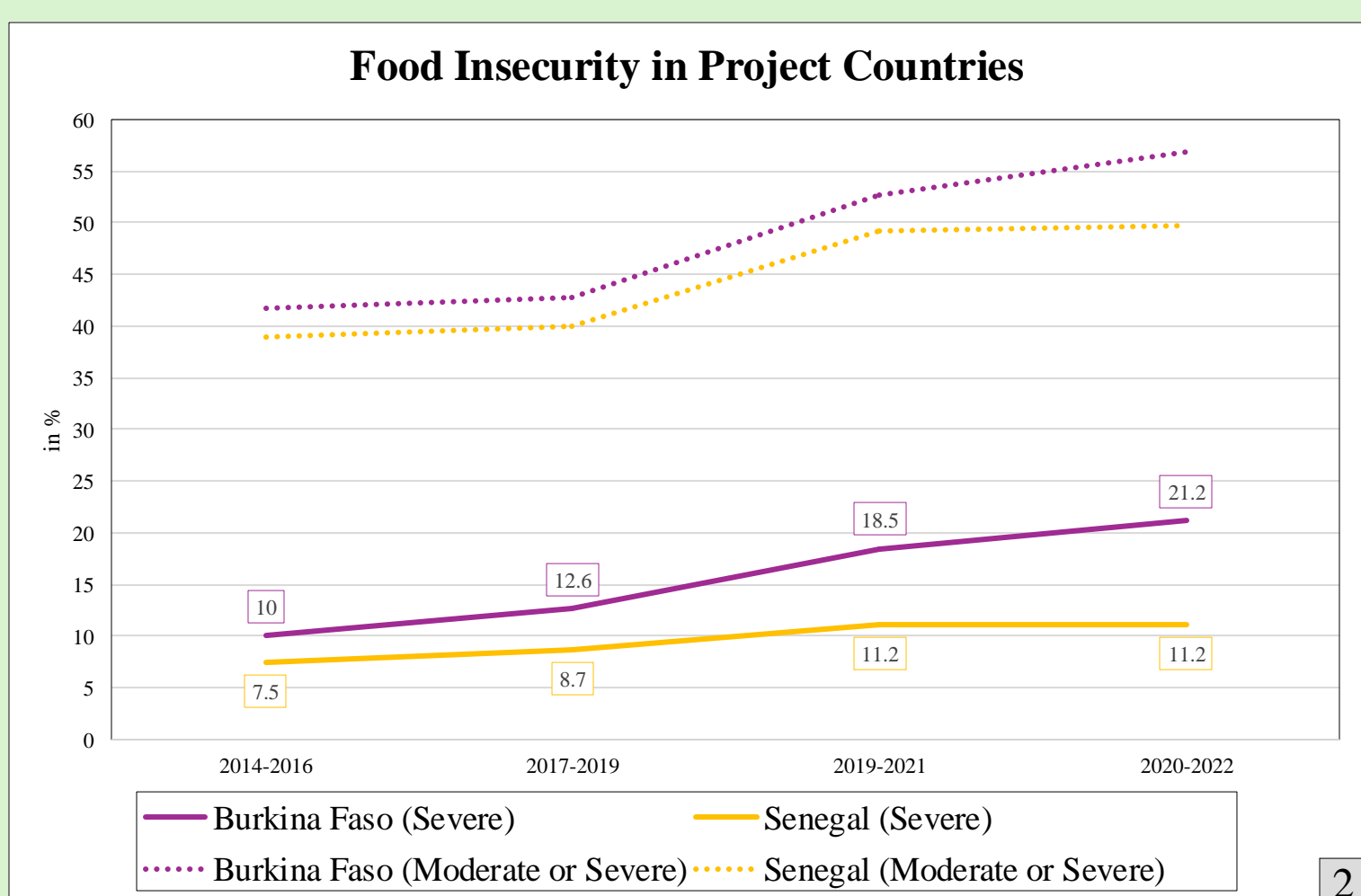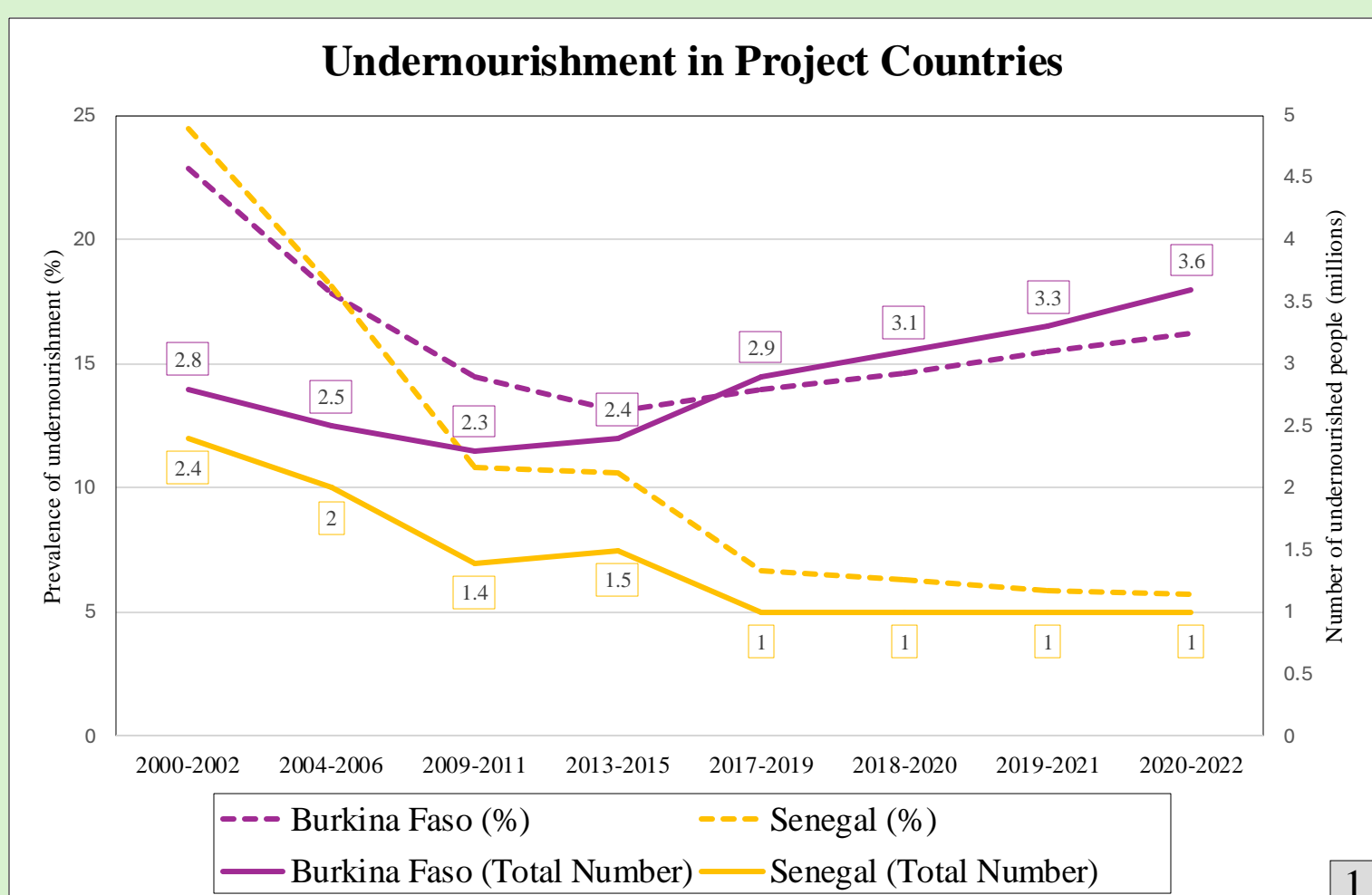
2. Method: Field Lab

Between 2022 and 2023, local weather observers were engaged in the nine participating rural villages. To ensure that the project is self-sustaining, the observers received pre-training, follow-up meetings, and worked on voluntary basis. They manually collected daily data on:

- Maximum temperatures (°C)
- Minimum temperatures (°C)
- Rainfall (mm)

Following, the collected data was:
- Analysed and compared to long-term averages by student assistants.
- Fed back to the local weather observers.
- Evaluated in focus group discussions.
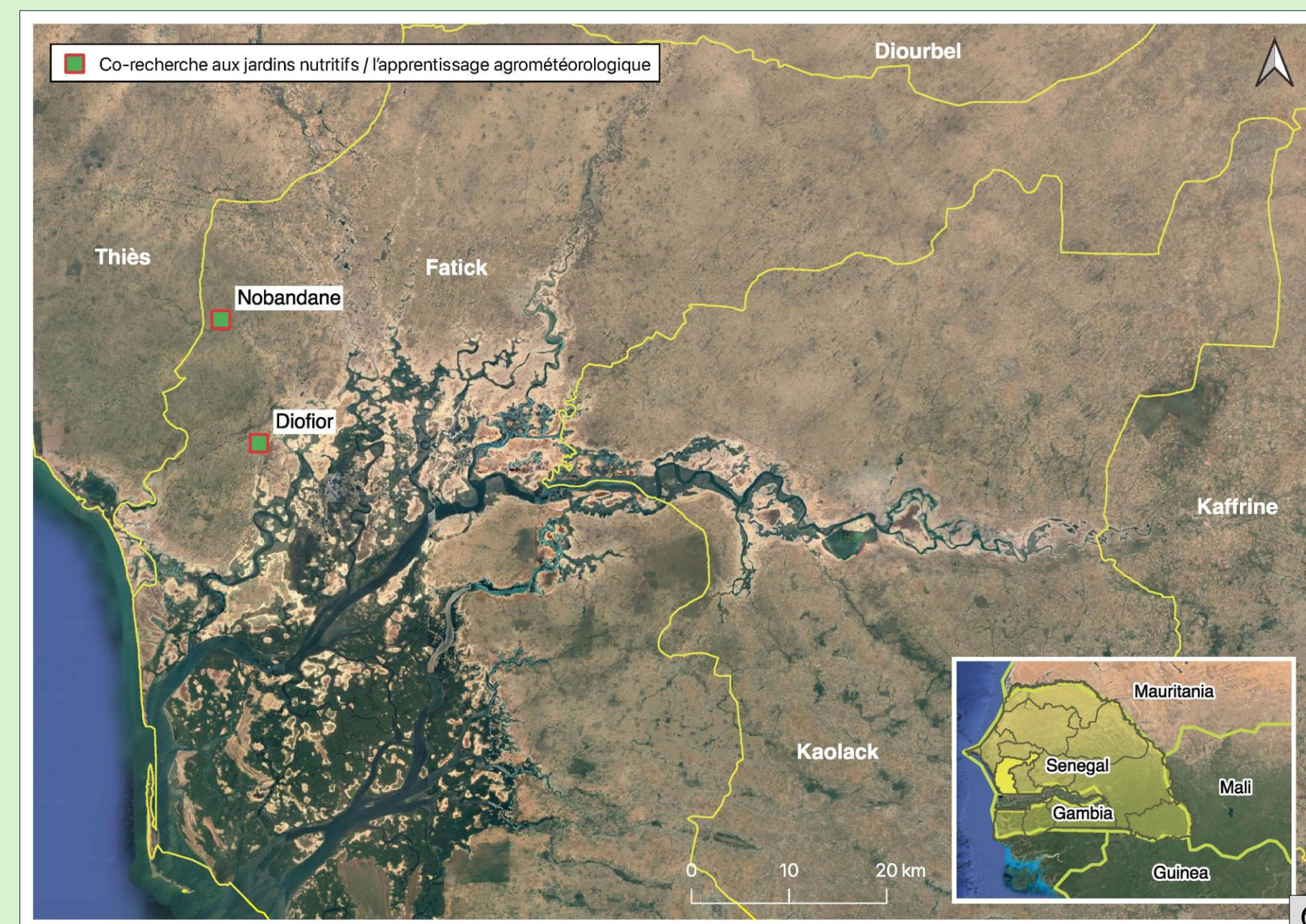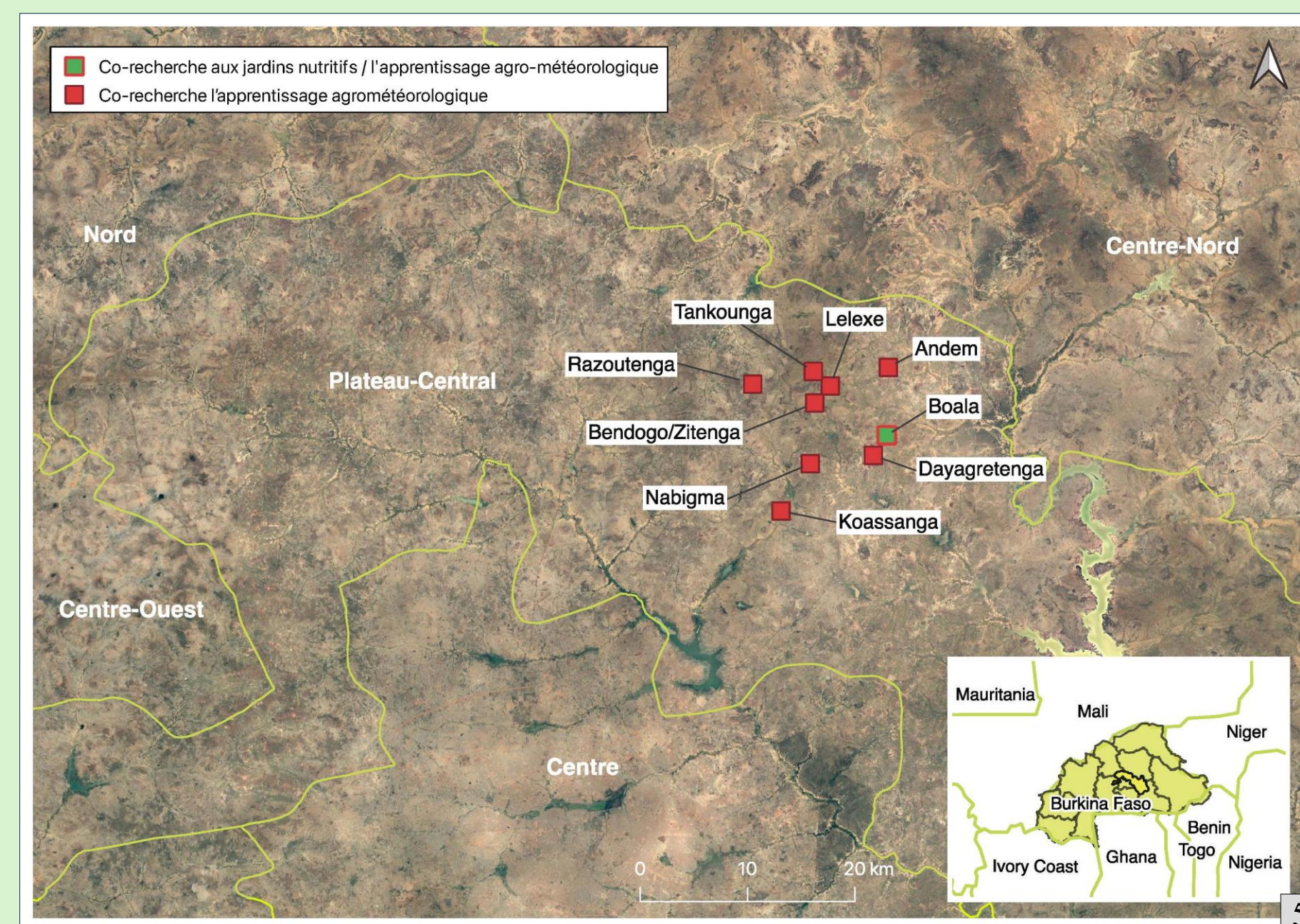

3. Learning Process & Results

1
- Communities expressed a strong demand for measured rainfall data.
- Local weather observers were empowered to read and interpret climate data.
- Processed data in form of climate diagrams is now accessible to participating local communities.


Ombrothermal Diagram Koassanga: 2023

2
- Maximum and minimum temperatures are on average higher than the long-term average.
- Precipitation values for April, May, June, August, September and October are well below average.

Note: Long-term average of rainfall and temperature values refer to annual average data 1991-2020 (World Bank 2024 a; b).


Total rainfall at project sites
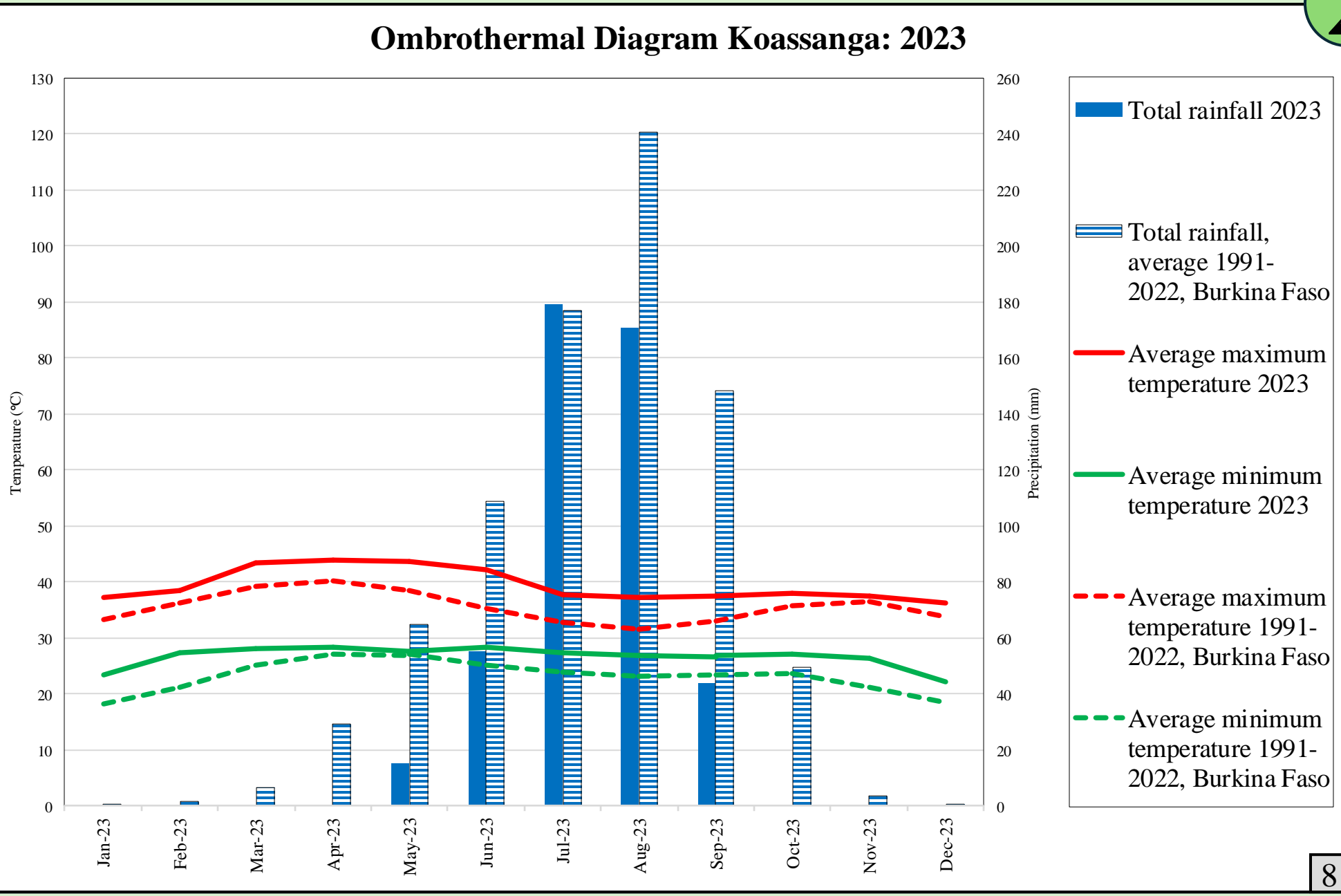
3
- Except Nabingma and Razoutenga, all project sites recorded lower rainfall in 2023 than in 2022.
- All project sites recorded rainfall below the long-term average in 2022 and 2023.
- For 2022 and 2023 in Koassanga, the precipitation was 41% lower than the long-term average.

Characterisation of total rainfall at project sites
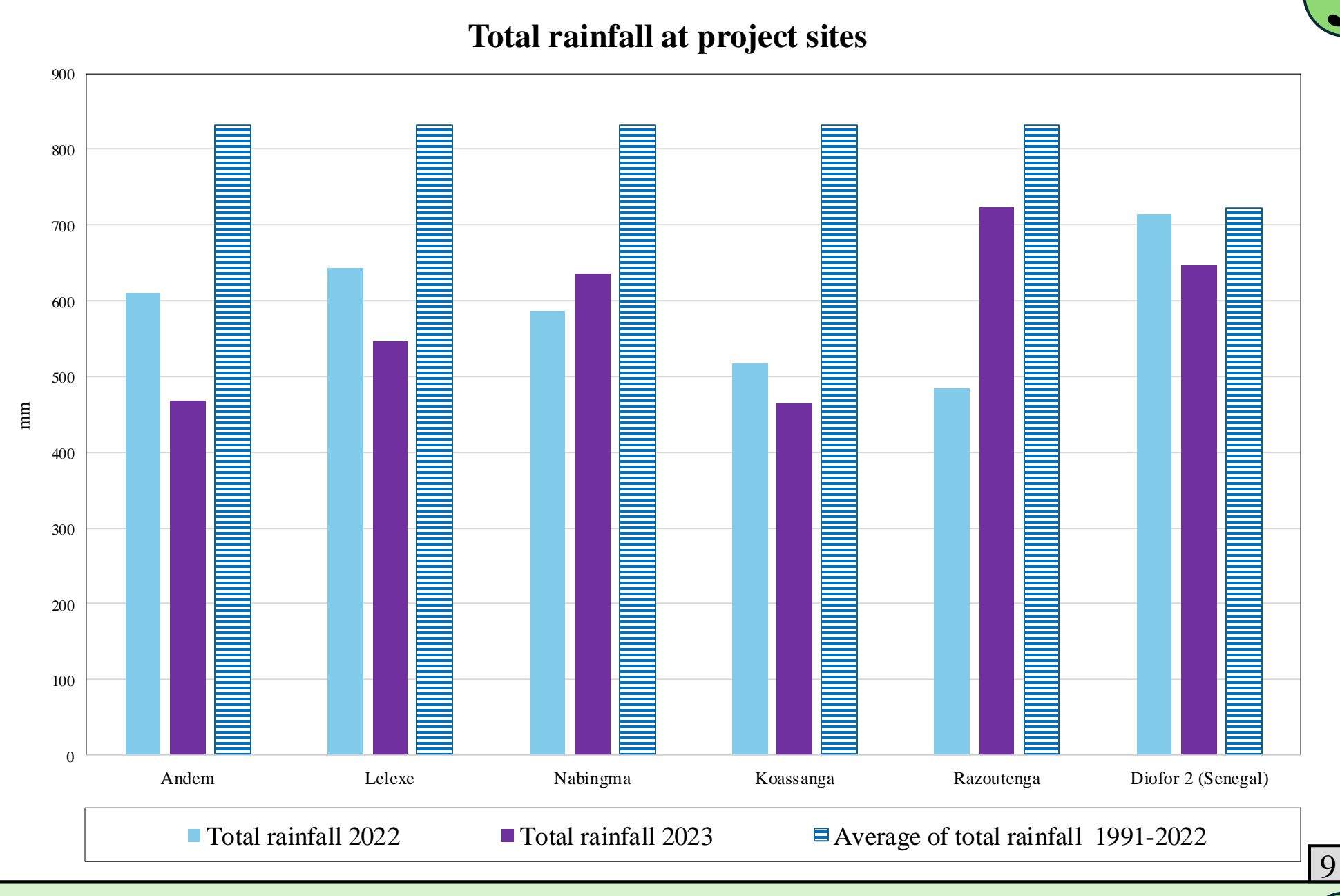
4
- Precipitation was higher in 2022 than in 2023, but it was spread over fewer days.
- On average, there were more days of heavy rain (37 mm or more per day) in 2022 than in 2023.

Note: World Bank data does not provide information on the number of rainy days, therefore it has not been possible to compare these with the long-term average.
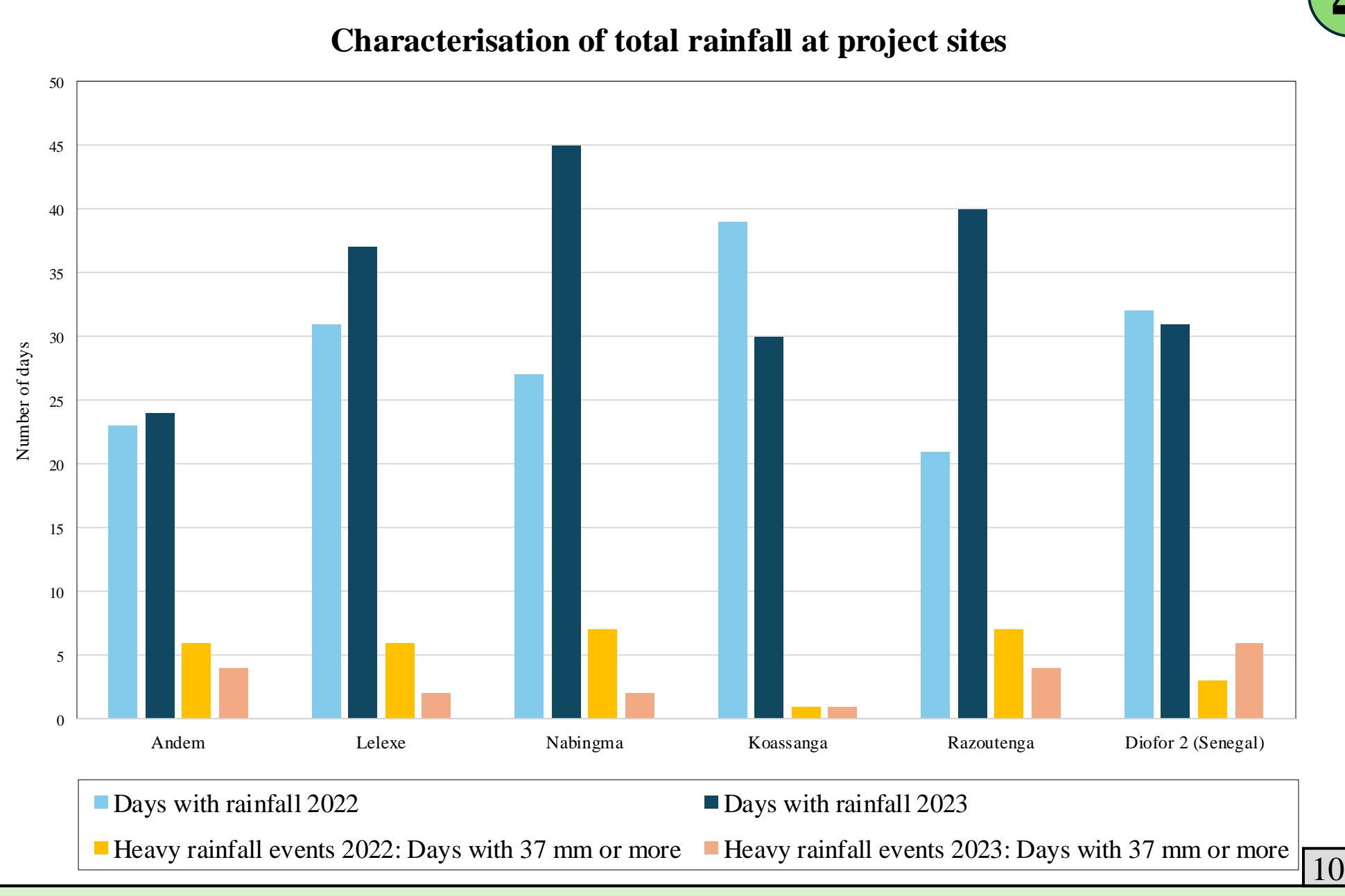
4. Conclusion

Reflections on Agrometeorological Learning:

1. Challenges included illiteracy, logistical issues and technical problems. For most of the participants, it was their first contact with thermometers and precipitation gauges. Weather observers reported problems with the thermometers: Some of them stopped functioning due to separating liquid inside.
2. Rainfall is the limiting factor for most farmers as apparently, measuring rainfall is more important than temperature: In Burkina Faso it was reported that villagers are very interested in the precipitation. They like to visit the observers after rain events and ask how much rainfall was measured.
3. Participants reported that they are now finally enabled to read and understand the weather diagrams of the municipality.
4. The Senegal team concluded that learning about agrometeorology should be closely linked to training in agroecology to ensure greater relevance for participating farmers.

Reflections on Quality of Collected Data:

1. Official long term weather data from national weather stations is inaccessible in both countries.
2. Finding farmers who are willing to participate in the project was partly difficult and even impossible in two of the nine initially planned villages in Burkina Faso.
3. Collected data was incomplete: Only three villages collected complete datasets, the rest missed consistent data reports for the project period. This can be explained by the effort involved in daily data collection.
4. Resulting, and to avoid the time-consuming daily observation, participants suggested measuring only rainfall during the rainy season.

Literature:
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Figures:
1, 2: Visualization by Arvid Sprenger (2024) based on data from FAO (2023).
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8, 9, 10: Visualization by Arvid Sprenger (2024) based on data collected within the project.
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