Project research Workflow

Total precipitation of each specific location that occurred in 2023.
In September 2020, profuse and continuous rainfall in Sudan caused a devastating flood across 17 out of the 18 states Sudanese states with the Blue Nile reaching water levels not seen for nearly a century. It ranks among the most severe floods recorded in the region.
*We could have compared the precipitation level in the last 3 years.

This approach will facilitate the analysis of the urban heat dynamics in Sudan, helping you develop targeted interventions to mitigate these effects on vulnerable populations.

Finding data

First, download the Sudan city data set from https://simplemaps.com/data/sd-cities.

Geocoding Cities

Use the OpenStreetMap Nominatim API to retrieve latitude and longitude for each city.
The step is crucial for fetching weather information.

Data Cleaning

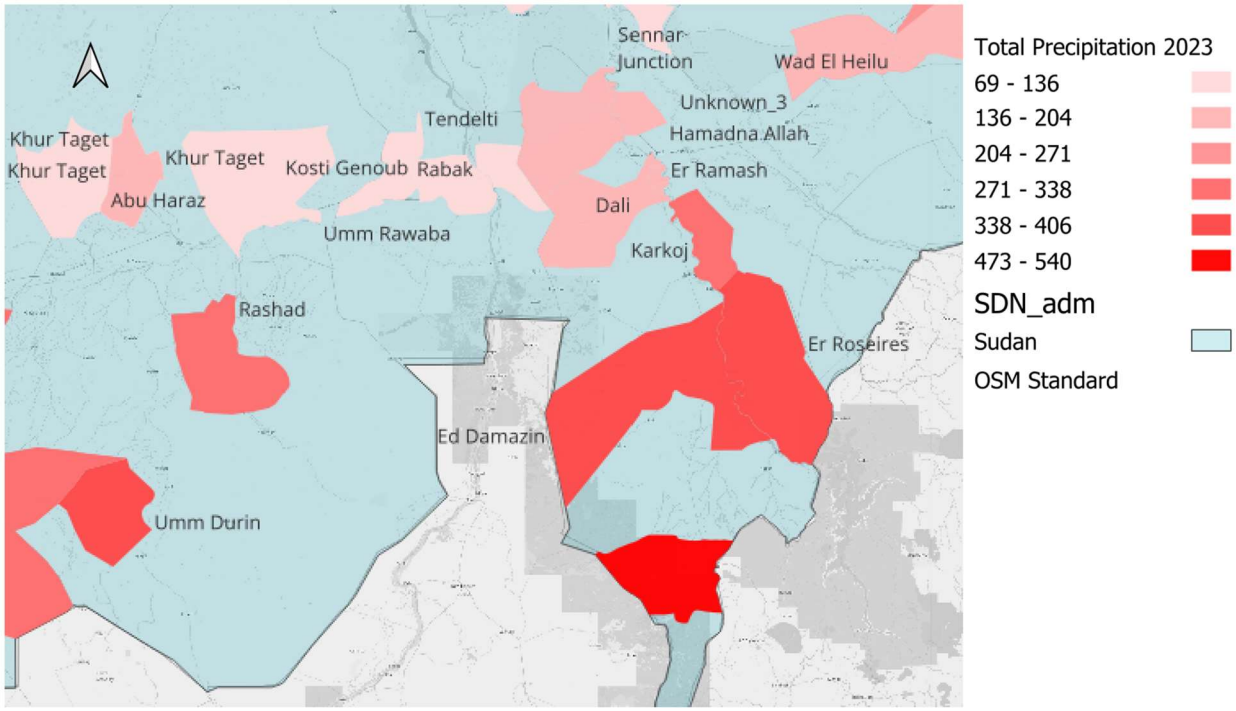
Utilizing OpenRefine or Power Query (P. Query) to clean the geocoding results and prepare the data for analysis.

Fetching Weather Data

using the open-meteo.com API to obtain total precipitation data for each city in 2023 to understand the impact of seasonal rains and potential flooding.

Data Merging and Analysis

Merge the cleaned city data with precipitation data to create a comprehensive dataset. Use this dataset in a GIS tool like QGIS to visualize and analyse total precipitation across different locations.



Objectives & Methodology:

Data collection: Collect rainfall data in the cities of Sudan, analyse the data for accuracy, and compare the outcome with historical weather information, to find out if there are trends or potential risks.
This is an attempt to understand the effects of precipitation on the urban heat island phenomena over Sudan, with an emphasis on flood-prone areas.
Development of Mitigation Strategies: Develop options for data-based mitigation of the impacts on vulnerable urban populations due to heavy rainfall and urban heat.

→As we already have 2023 data,
Project Start: New data collection as of **01/01/2024** to be completed by **31/12/2025.**
Can either use remote sensing or community volunteers who has access to cell phones.

Data collection App e.g. KOBO or Activity info that has access to GPS and can register weather temperature.
The data aimed to be collected:

- Geospatial data (to link it with weather data).
- Weather data
- Demographic data to determine the affected population.

Targeted Area Wadi al Nile / Blue Nile that has registered highest precipitations in 2023 and was highly affected in 2020-2022.

Phase 1: Pilot Implementation **(Month 1-3)** - Test interventions starting from the capital by training gov both NGOs and community volunteers.
Phase 2: Evaluation and Adjustment **(Month 4 - 5)** - Assess the outcomes and optimize strategies.
Phase 3: Full-Scale Implementation **(Year 2)** - Extend successful to rest of the regions with a focus of the affected areas between 2020 – 2022 and areas with highest precipitations in 2023.

The devastating floods of 2020-2022 have underscored the urgent need for informed and community-focused interventions that address both immediate and long-term vulnerabilities of the affected populations.

RISK

- Data accuracy and access to internet connection (which can be solved by offline storing sys).
- Lake of community engagement (culture would play a big role in engaging with community.
- Political background and instability.
- When it comes to scalability strategies which has resulted successful in one urban area may not be transferable to another due to different environmental, social, or economic contexts.