

Building a Locally Informed Climate and Health Data Infrastructure in Bangladesh

UM: Pamela Jagger (SEAS), Joe Eisenberg (SPH), Mohammed Ombadi (CLASP), Andrea Mahieu (SEAS), Swati Mishra (SPH)

icddr'b: S.M. Manzoor Ahmed Hanifi, Rehnuma Haque, Sharoardy Sagar, Saief Zawad

Introduction

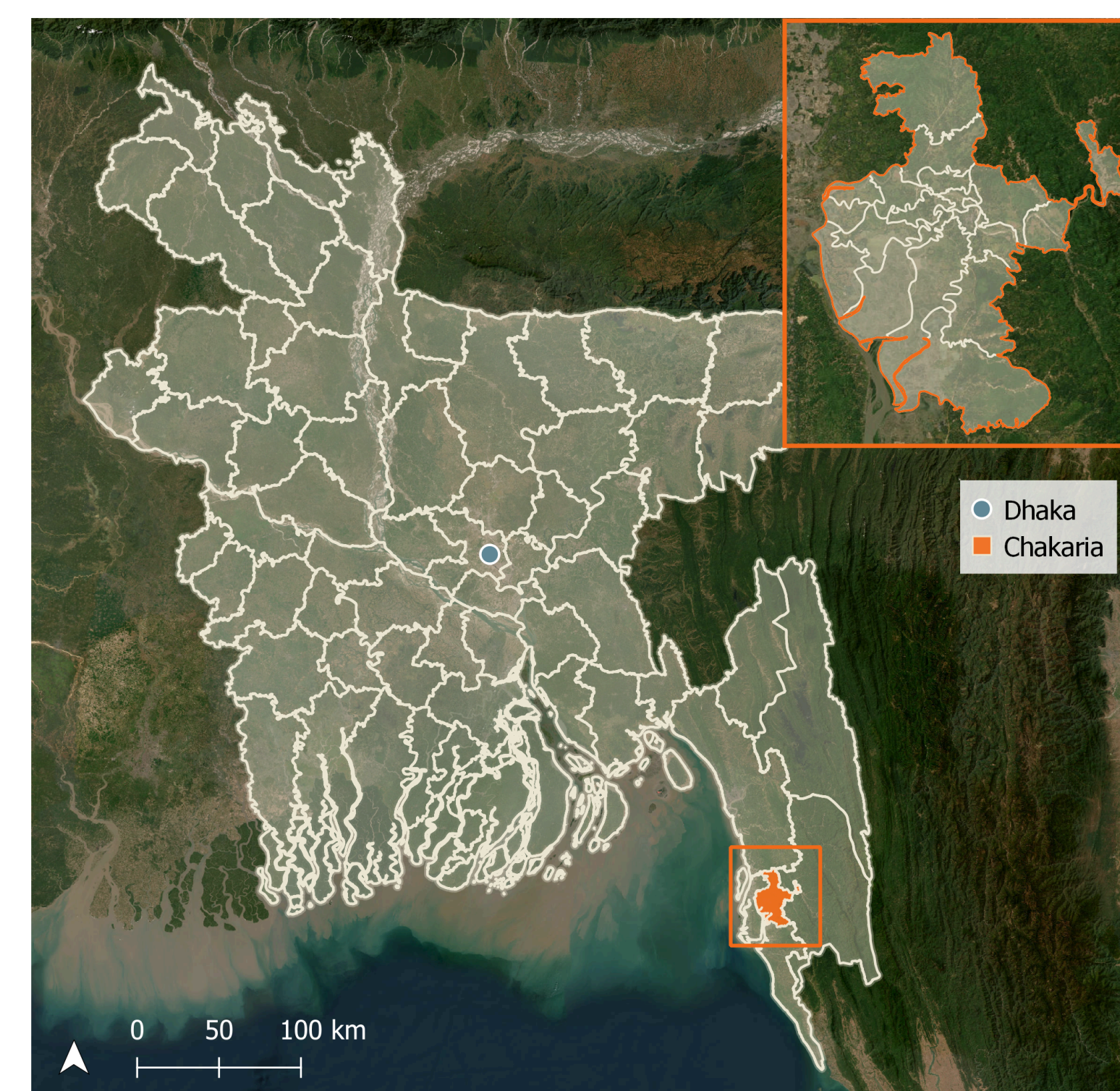
- Bangladesh is among the countries most affected by extreme weather events [1].
- We focus on **Chakaria, Bangladesh**, a rural and coastal area with many climate and health risks.
- Since 1999, icddr'b has run a demographic and health survey (HDSS) across 19,000 households in Chakaria.
- Our research aims to:
 - **Validate a climate shock survey** for use in the Global South
 - **Create an integrated research and surveillance platform** for robust assessments of impacts of extreme weather.

Methods

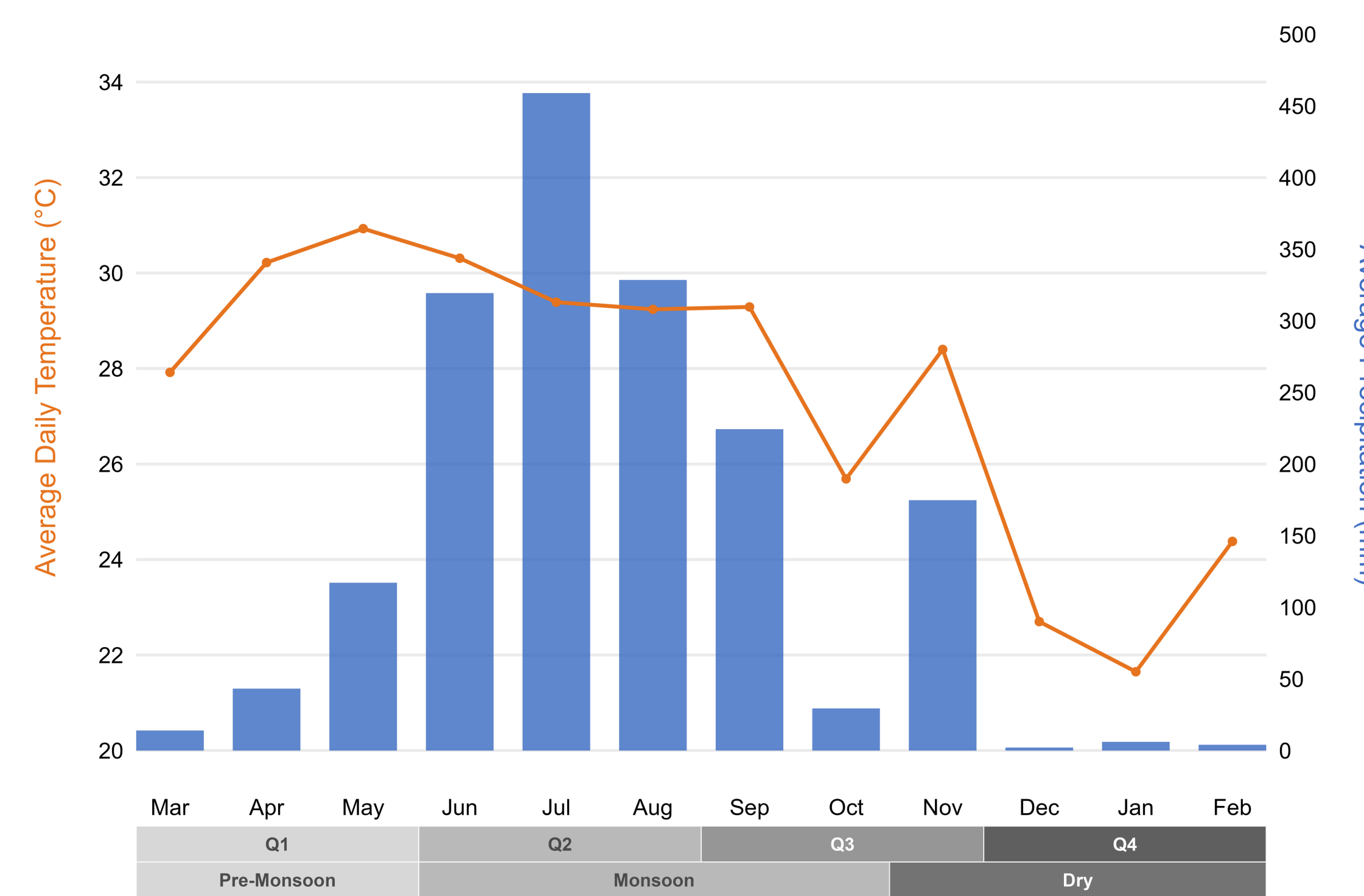
- **Climate shock survey** to assess impacts and adaptations to extreme weather (heat, flooding, heavy rainfall):
 - 490 households
 - Baseline + 4 Quarterly visits
- **Environmental monitoring:**
 - Outdoor weather stations
 - Indoor temperature loggers
 - Purple Air monitors
 - Drinking water salinity measurements
- **Integrate data:**
 - icddr'b long-term HDSS data
 - Household survey data
 - Downscaled climate data
 - Health center data

Preliminary Results from Baseline Survey

- **Extreme heat and heavy rainfall are common challenges.**
 - Over the past 12 months, 99% of respondents experienced extreme heat and 94% experienced heavy rainfall.
- **Households experience mental and physical impacts of extreme weather.**
 - Most common impacts of extreme heat: Physical health issues (94%); sleep disturbances (94%); increased health expenses (92%); mental health issues (92%).
 - Impacts of heavy rainfall: Data to be collected during quarterly visits.
- **Households adapt in a variety of different ways.**
 - Most common adaptations to extreme heat: Modifying work schedule to avoid peak heat hours (87%); reduced food consumption (87%); taking cool showers (83%); wearing lightweight clothing (82%).
 - Adaptations to heavy rainfall: Data to be collected during quarterly visits.



Map of Bangladesh with inset map of Chakaria district. Administrative boundaries and satellite imagery from [2, 3]



Average temperature and precipitation in Chakaria, Bangladesh (2010-2020). Strips indicate survey quarters (Q1-Q4) and climatological seasons. Climate data from [4].



Recent flooding in Chakaria



Homes destroyed due to a recent cyclone in Chakaria



Weather station installed on top of the icddr'b office in Chakaria

References:

- [1] Eckstein, D., Kunzel, V., & Schafer, L. (2021). Global Climate Risk Index 2021 [Briefing Paper]. Germanwatch. <https://www.germanwatch.org/en/crisis/>
- [2] Global Administrative Areas Database (2025). Version 4.1. <https://gadm.org/>
- [3] ESRI World Imagery (2026). <https://www.arcgis.com/home/item.html?id=10df2279f9684e4a9f6a7f08feb2a9>
- [4] Weather and Climate (2026). Climate Chakaria: Weather By Month. <https://weatherandclimate.com/bangladesh/chittagong/chakaria>

Extreme heat and heavy rainfall are common challenges in Chakaria, Bangladesh.

Households experience both physical and mental impacts of extreme weather.

More research is forthcoming on impacts and adaptations over next 12 months.