



ONEKAN



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to make visible

*Earth **Observation**-based modelling for making thermal inequality visible in African cities*



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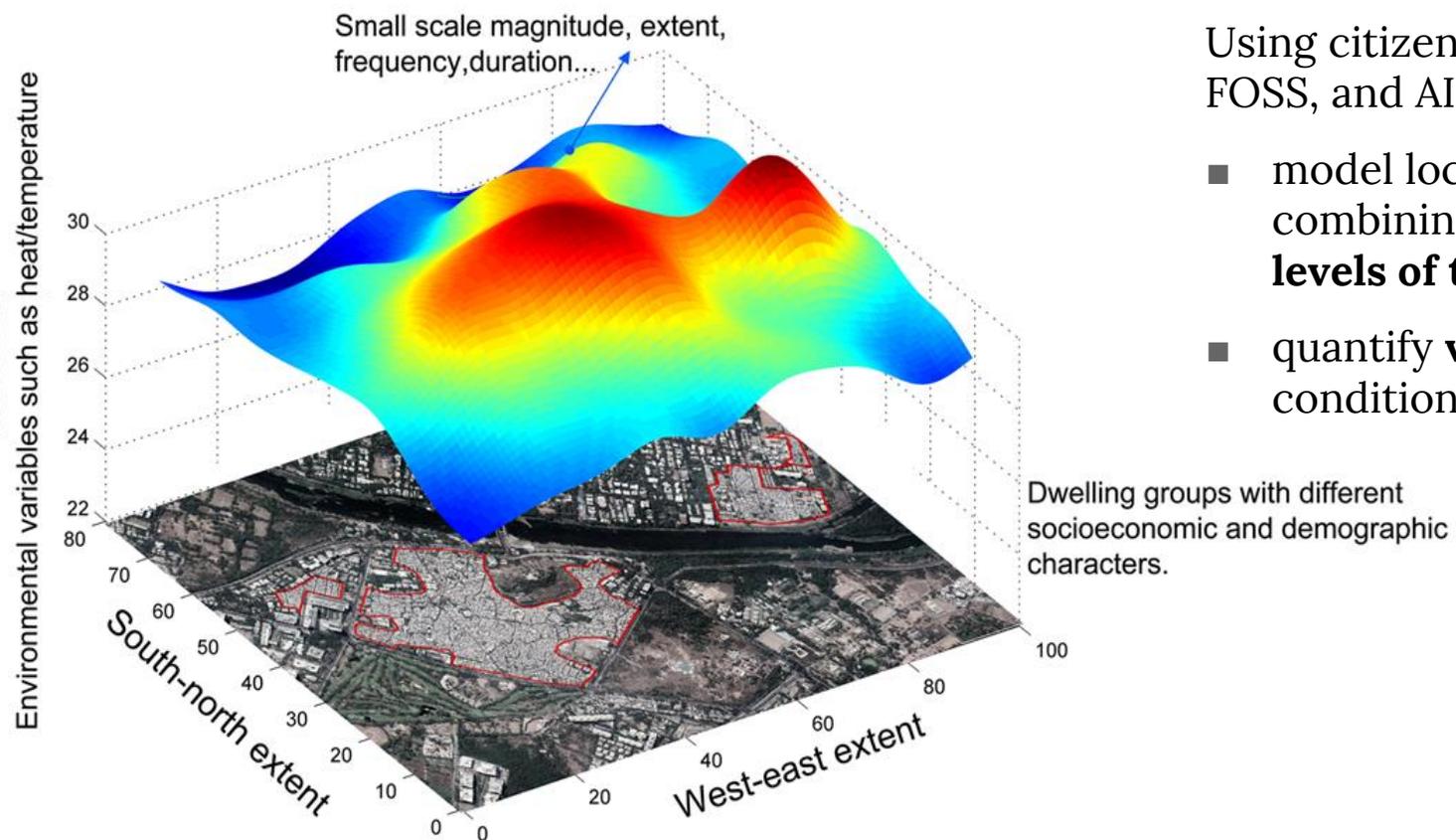
WHAT?

Research question: How and why are urban dwellers with different levels of deprivation divergently exposed to variations of temperatures and extreme heat ?

Hypothesis

Using citizen science & open or low-cost satellite images, FOSS, and AI, it is possible to:

- model location, extent and characteristics of areas combining both **high levels of deprivation and high levels of temperature variation/extreme heat**
- quantify **vulnerable population** exposed to such conditions



Methodology

EARTH OBSERVATION



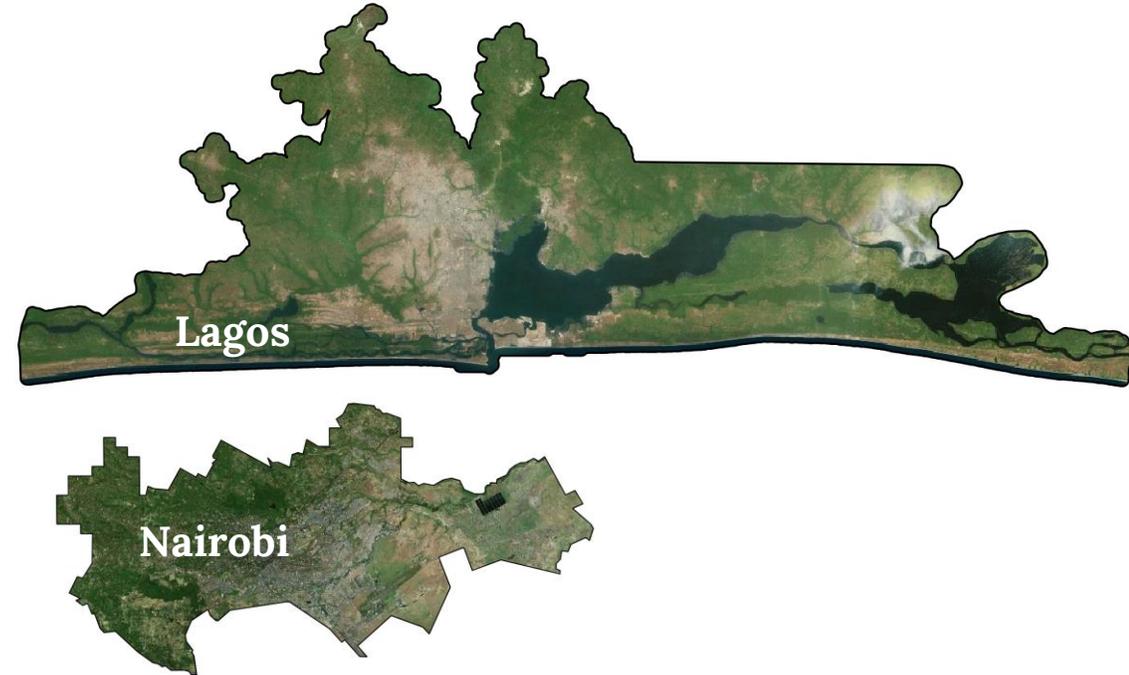
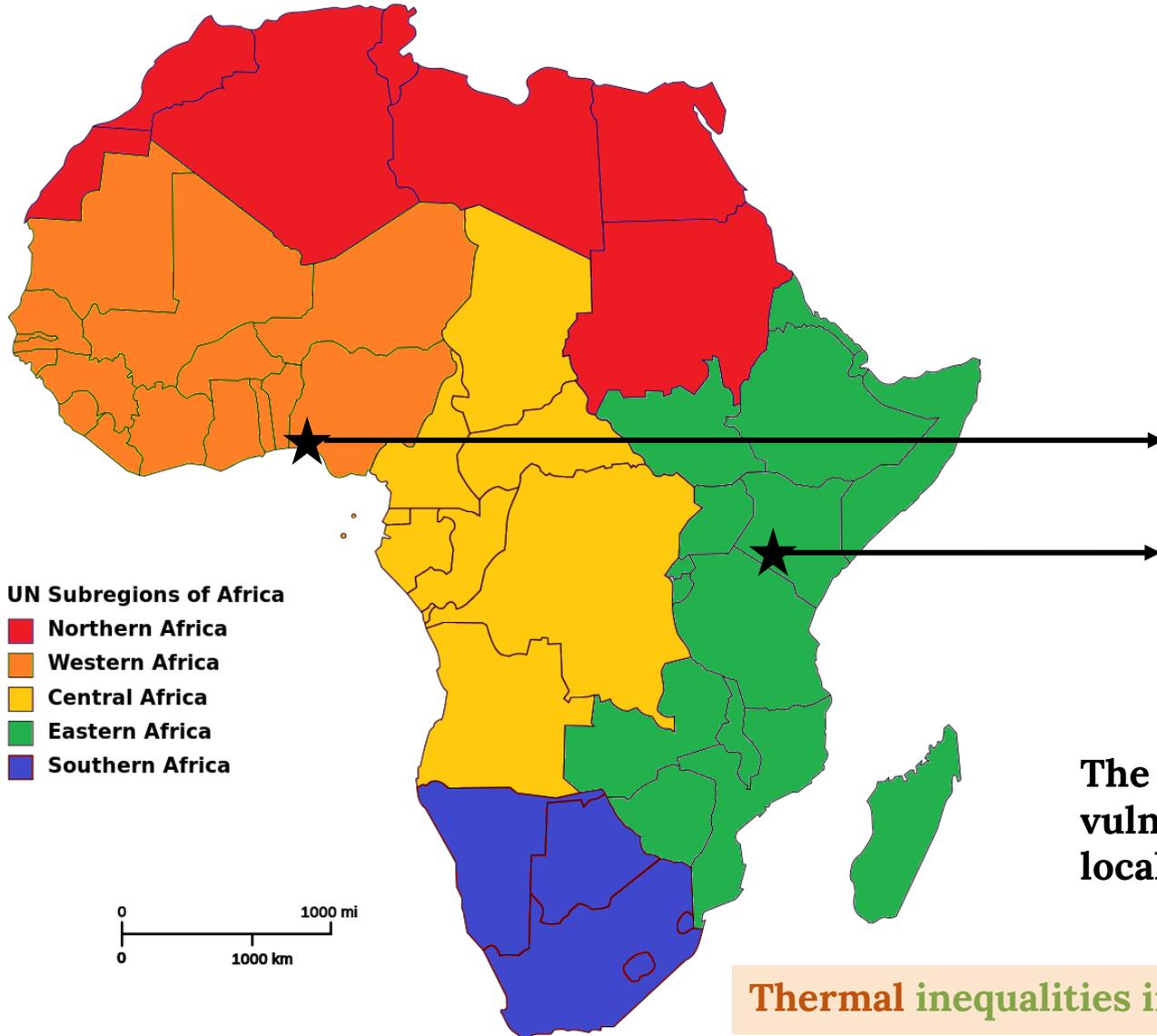
CITIZEN SCIENCE



WHERE?

Study areas | Two SSA fast growing cities

- Nairobi affected by temperature variations
- Lagos affected by extreme heat



The variability of heat exposure and the number of exposed vulnerable people are absent from existing data, models and local dwellers' knowledge.

Thermal inequalities in SSA cities are invisible: Need to put them on the map!



HOW?

Methodology | Citizen science & Earth Observation-based modelling (AI)

AIR TEMPERATURE variations and extremes

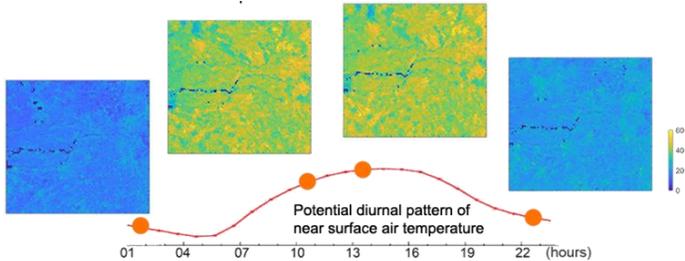
Data-poor context

DEPRIVATION index

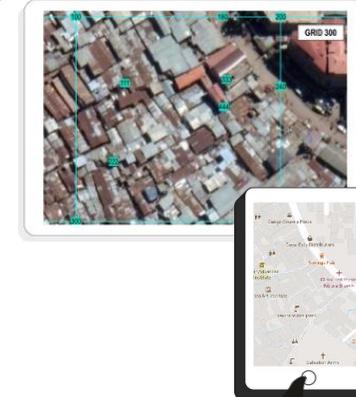
Surveys



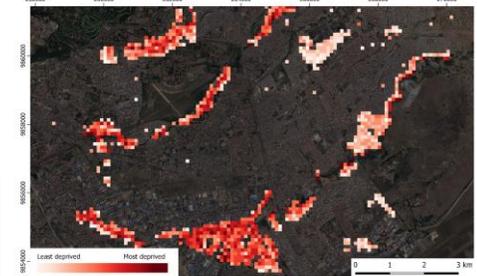
EO-based model



Surveys



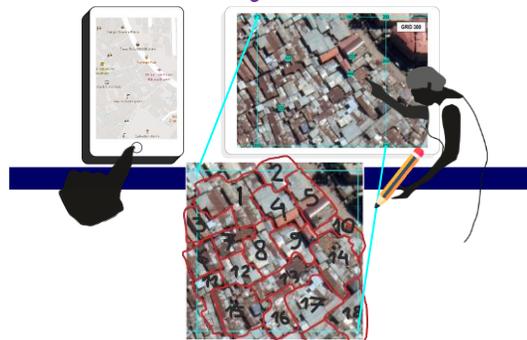
EO-based model



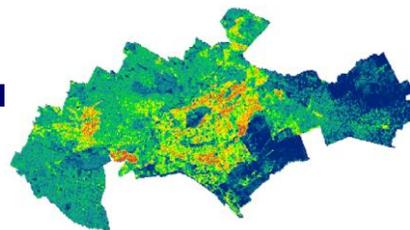
AREAS WITH HIGH DEPRIVATION AND HIGH TEMPERATURE VARIATIONS

POPULATION distribution

Surveys



EO-based model



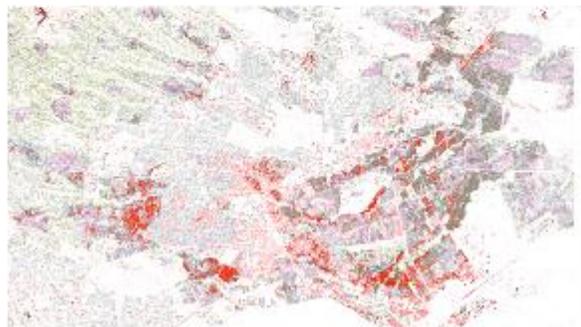
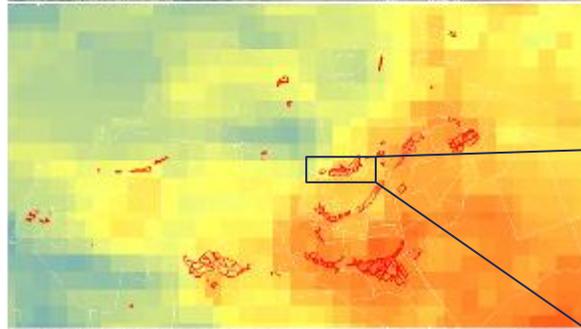
EXPOSURE

Number of people exposed

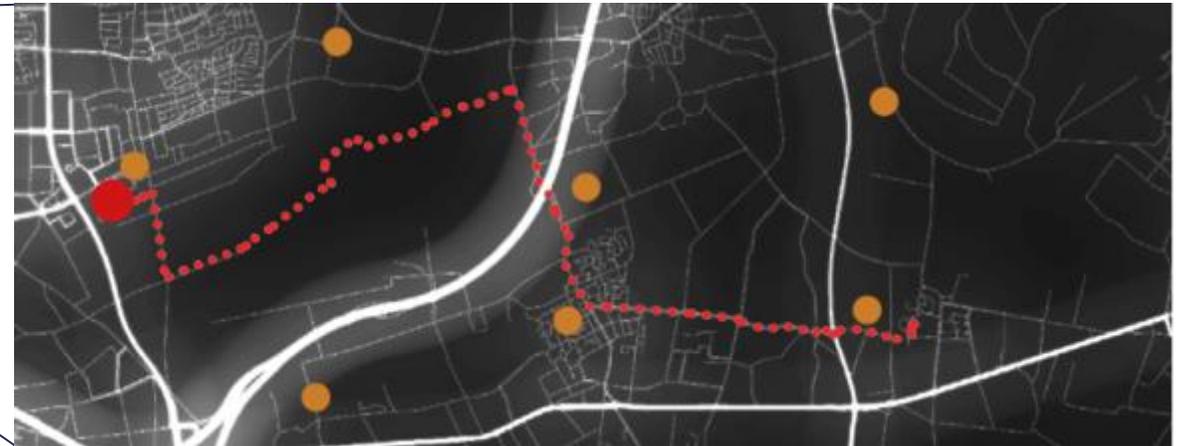


HOW?

Methodology | EO approach | Air Temperature modelling



- Main goal: High resolution temperature maps in both space and time in target neighbourhoods
- In-situ fixed measurements complemented by transects guided by varying urban environments



t_0 : In-situ measurements (orange) complemented by transect (red) that will cover varying urban environments, and also stay close to the in-situ measurements for verification



FOR WHAT PURPOSE?

Societal Impact | Towards green and sustainable cities

- Better understanding of relationships between urban deprivation and exposure to temperature variations and extremes
- Transferable methods combining advancements in EO and citizen science
- Evidence of climate vulnerabilities of the urban poor
 - setting priorities – most vulnerable first
 - campaigning for more climate-resilient urban spaces
- Stimulating awareness and supporting advocacy with data
- Low-cost local adaptation measures – improving living quality



EARTH OBSERVATIONS FOR THE SUSTAINABLE DEVELOPMENT GOALS

