

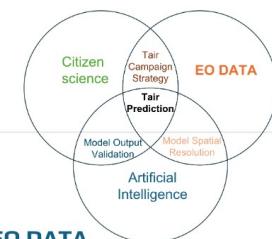
INTEGRATING CITIZEN SCIENCE AND EARTH OBSERVATION DATA IN AFRICAN SLUMS

INTRODUCTION

- Temperature extremes in Sub-Saharan Africa projected to increase in magnitudes and durations twice more relative to Europe (IPCC, 2023; World Cities Report 2022)
- Intra-urban Heat studies reveal higher LST (Temperature of the earth surface) in low-income/deprived settlements such as slums.
- Yet there is limited studies and data about air temperature (perceived temperature that impacts health) in slum areas.
- These areas are often overlooked by planning agencies due to their informal status though they lack the adaptive capacity to deal with these climate challenges.
- A main pillar of EWS is risk detection and monitoring: Currently non-existent in most slum areas.



METHODOLOGY



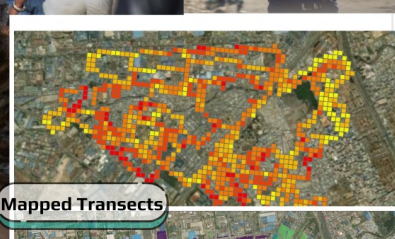
CITIZEN SCIENCE

20 youths from each informal settlement

- Collaboratory citizen science: from conceptualization to and model validation
- Knowledge exchange: Workshops to leverage local knowledge and Community awareness
- Transect walks: Measuring temperature across diverse urban morphologies in 12 informal settlements

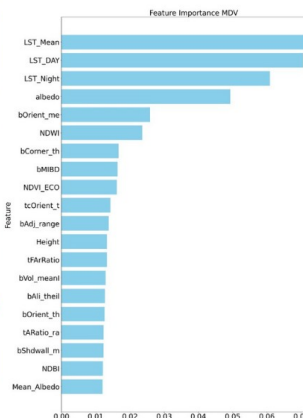
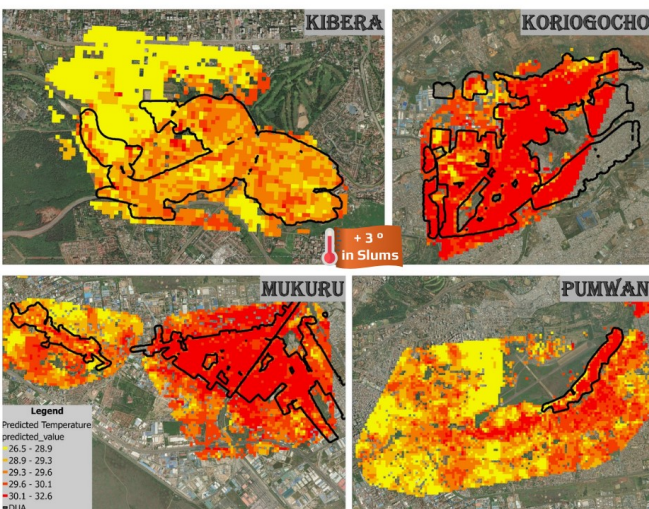


Community Engagement



Mapped Transects

RESULTS



TRAINING TESTING
MAE: 0.05 0.08
R2: 0.98 0.87
RMSE: 0.09 0.14

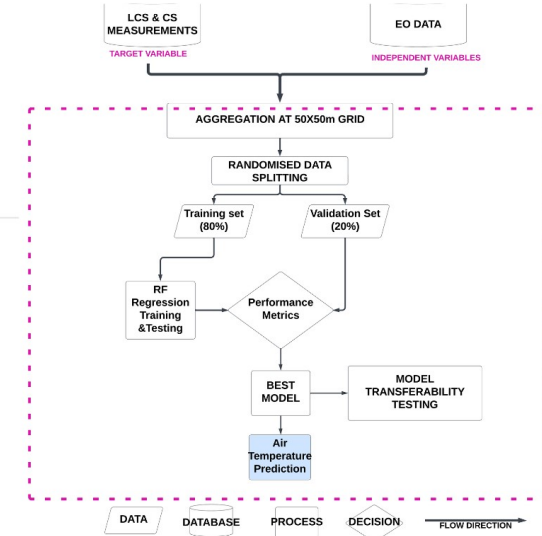
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EO DATA

Covariates	Source	Resltn
Building footprint (Morphometrics)	Google open buildings V3	(EPSG:43 26)
Building Height	WSF 3D	90m
Elevation	ALOS PALSAR	12.5m
NDVI, NDBI, NDWI	Sentinel2	10m
LST	Ecostress	70

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MACHINE-LEARNING MODEL



CONCLUSION

This study reveals intra-urban heat disparities. Slum settlements are consistently warmer than formal areas: a hazard amplified by morphology and surface characteristics.

By integrating citizen science generated data with AI, we demonstrate how young community members can contribute to local heat monitoring, becoming frontline actors in hazard detection.

Empowers young people in marginalized communities to advocate for equitable climate resilience.



VARYING LIVING CONDITIONS

