

EO and AI for more resilient and equitable cities in Africa

Characterising Deprived Urban Areas

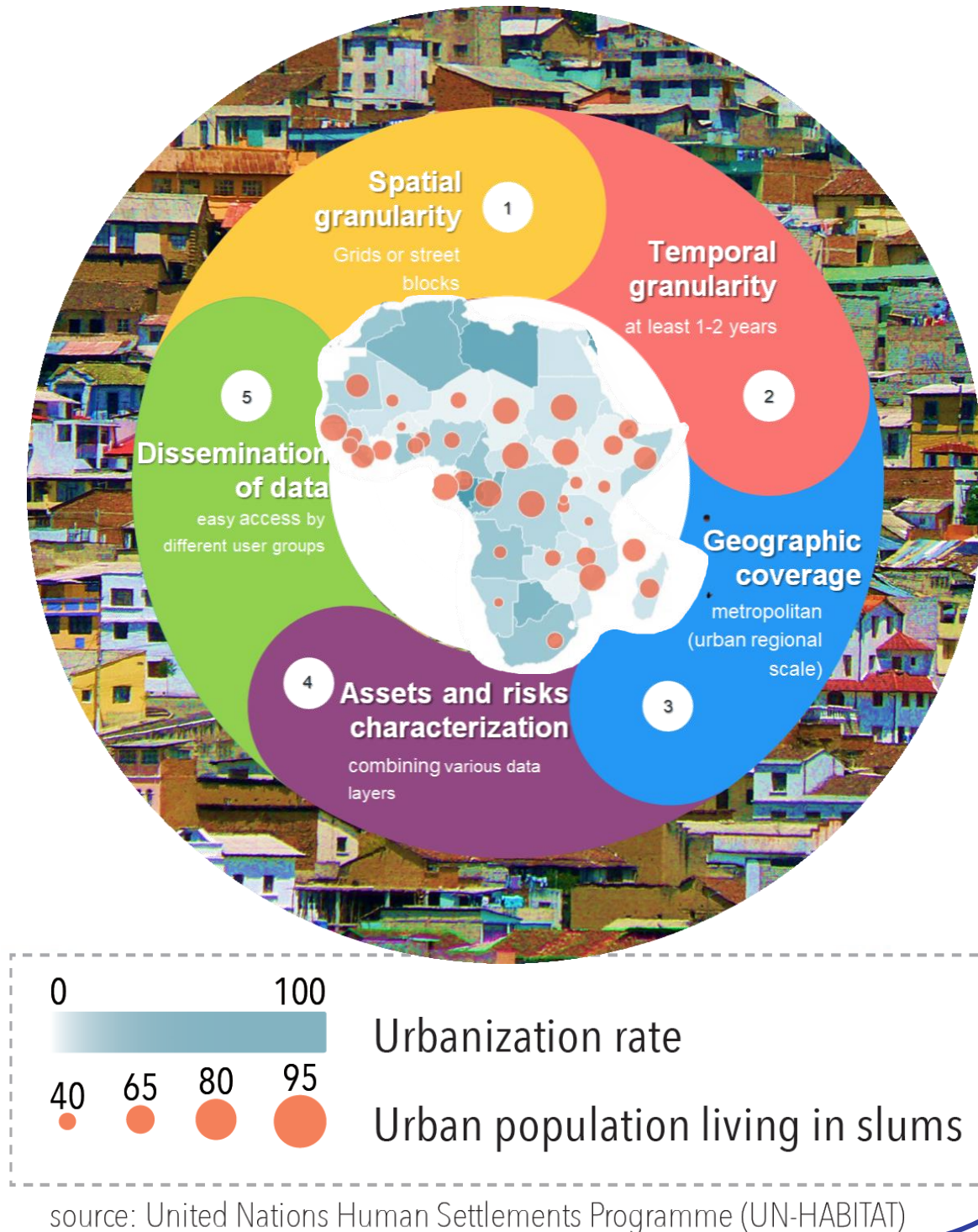
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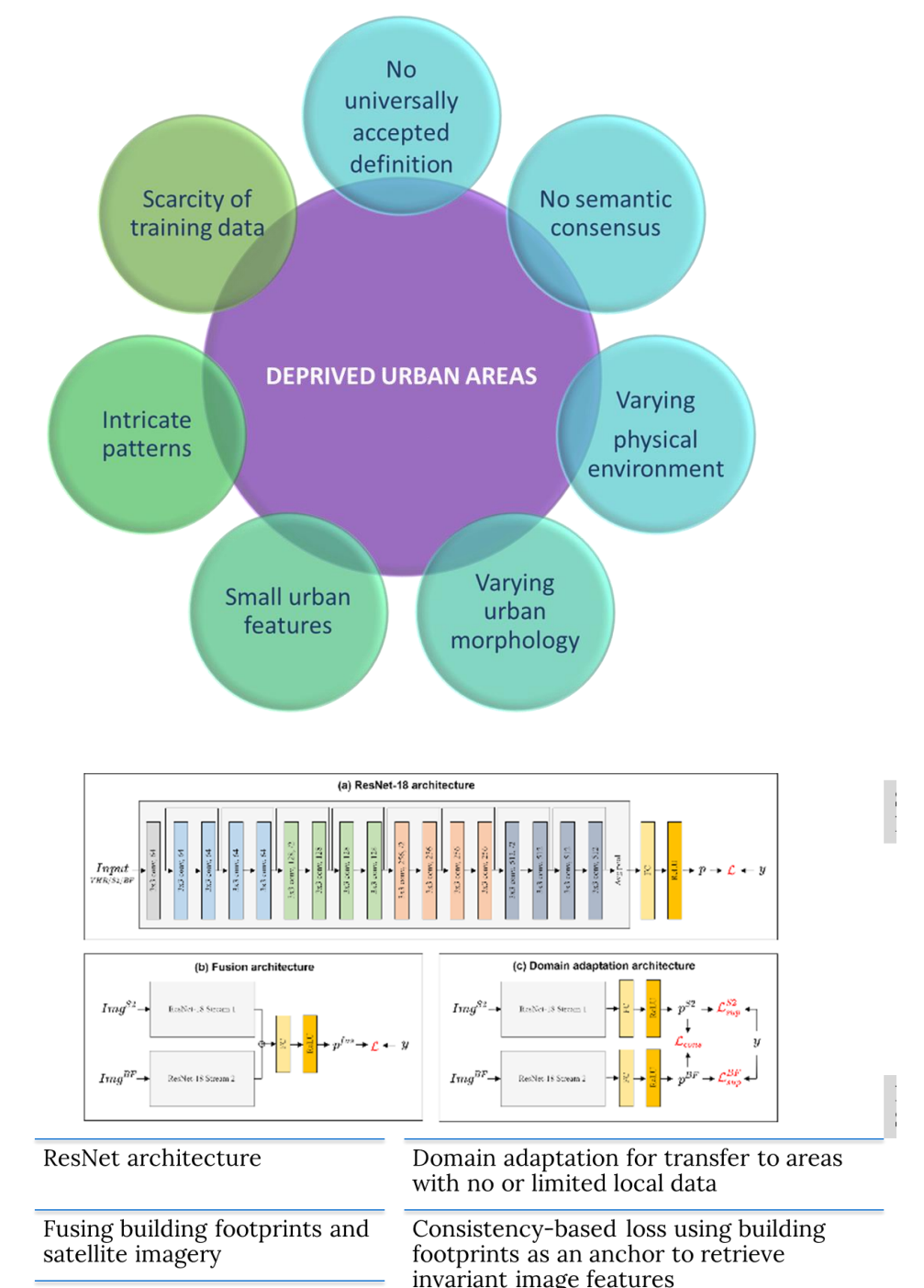
1 INTRODUCTION

- Cities in sub-Saharan Africa are faced with rapid urbanisation, leading to growing needs for affordable housing and basic services
- An estimated 60% of urban dwellers live in 'slums'
- Inclusive development requires targeted efforts
- Spatial data are sorely lacking to support informed decision-making and policies
- We are harnessing the potential of Earth Observation and AI for taking stock of the situation in a synoptic manner
- Our research provides innovative methodologies, consistent, reliable maps and quantitative indicators of deprived urban areas



② METHODS

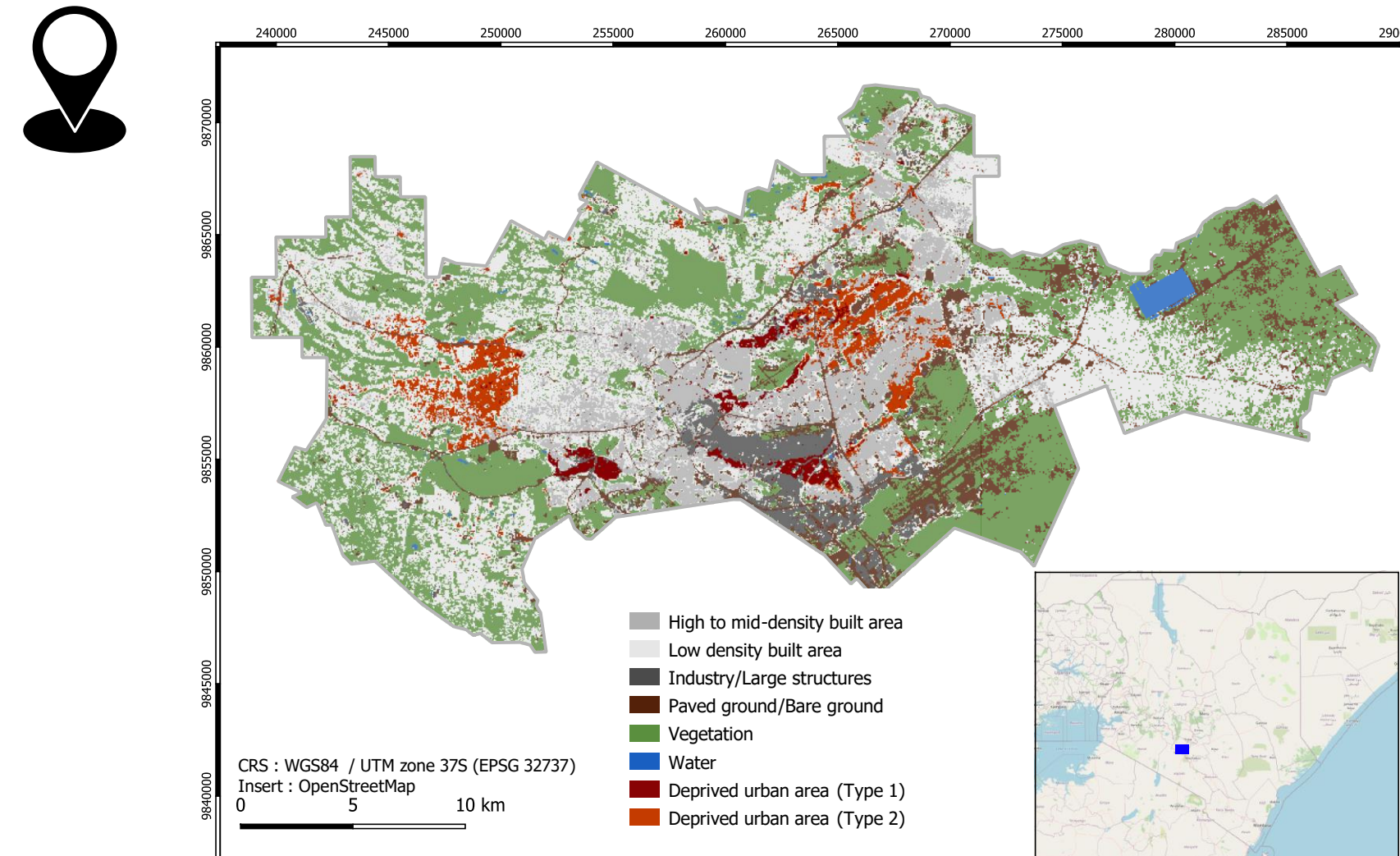
- The spatial study of deprived urban areas comes with several challenges
- We develop advanced methods involving Machine Learning/Deep Learning models to extract their location, their detailed environmental and physical characteristics, and higher-level information (e.g., population, exposure)
- We use mostly open EO imagery (Sentinel-1/2, ECOSTRESS,...) and open geodatasets
- When needed, *in situ* data are collected with the communities, in a participatory approach
- We produce gridded maps, at a resolution of 100 m
- Indicators can be derived at varying aggregation levels, e.g., in administrative units



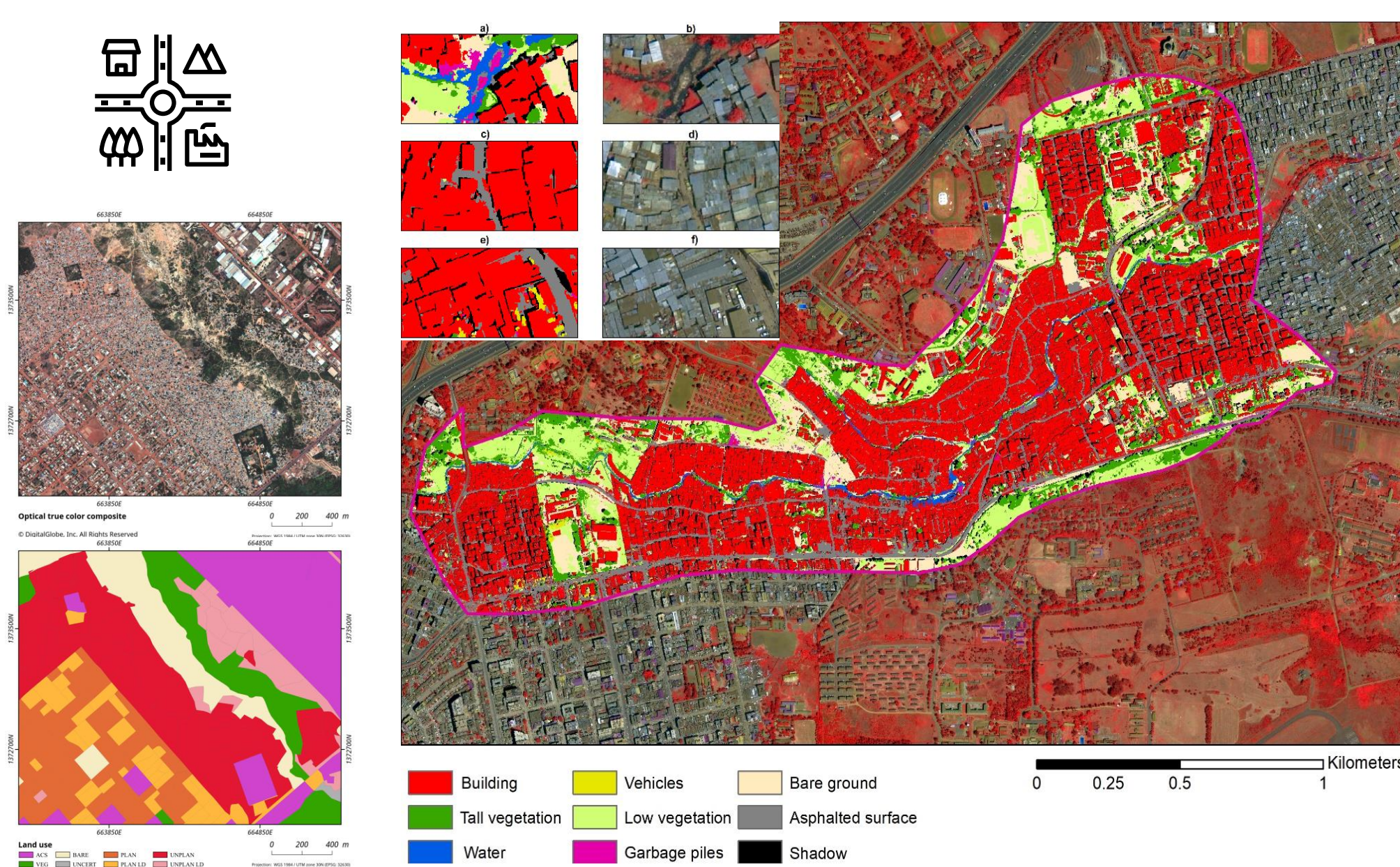
③ RESULTS

- Examples of applications

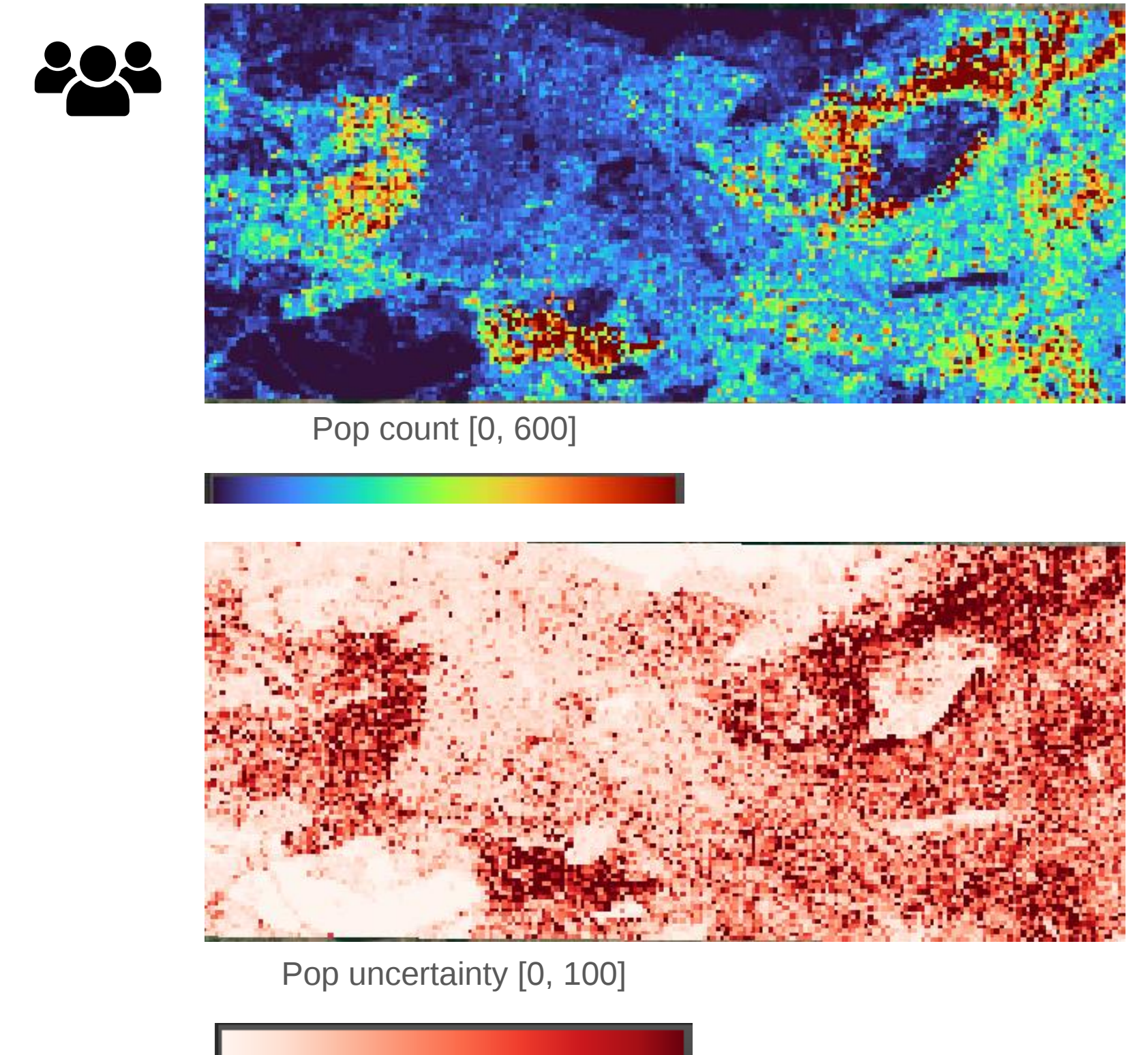
LOCATION AND EXTENT



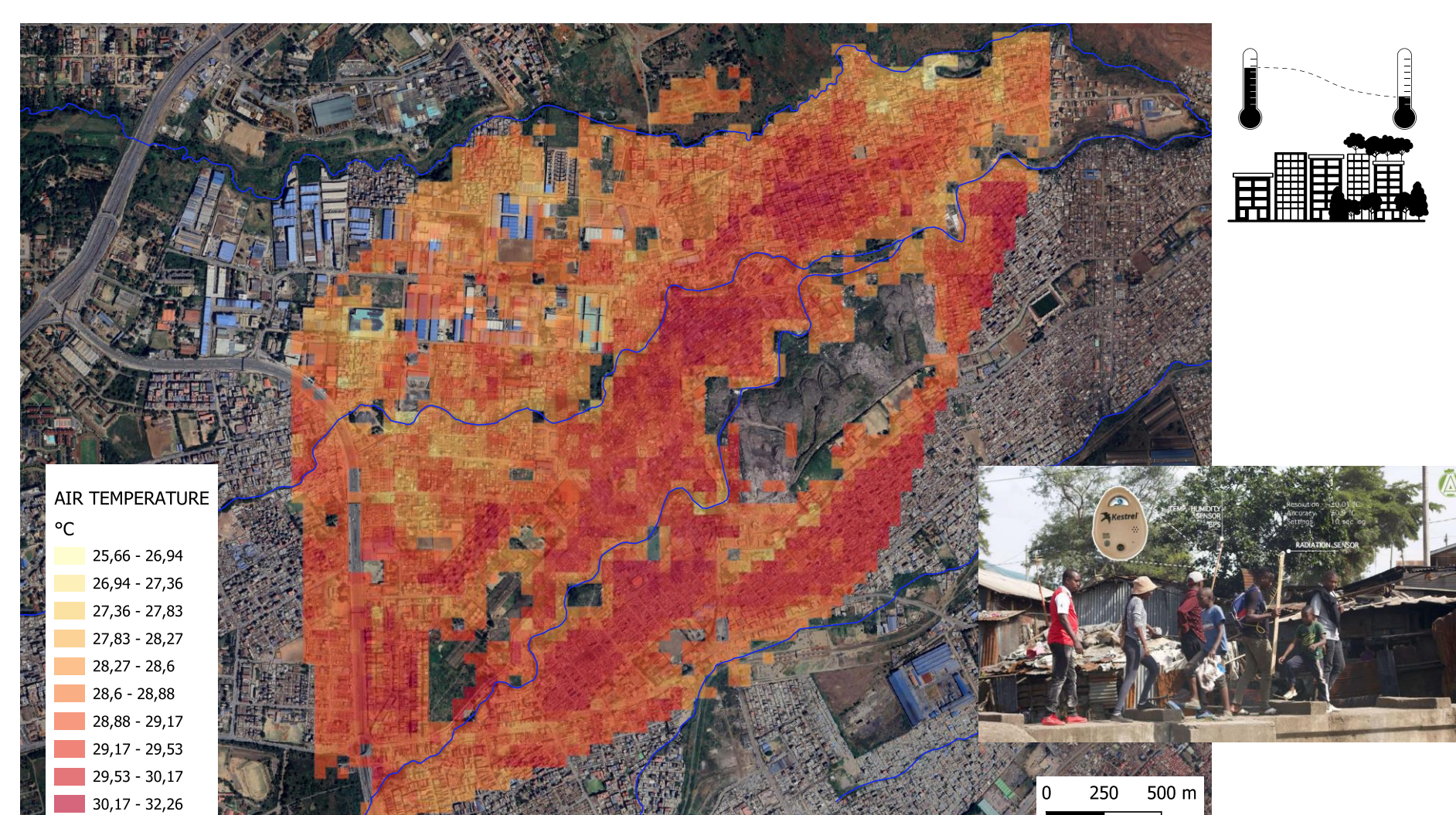
LAND COVER AND LAND USE



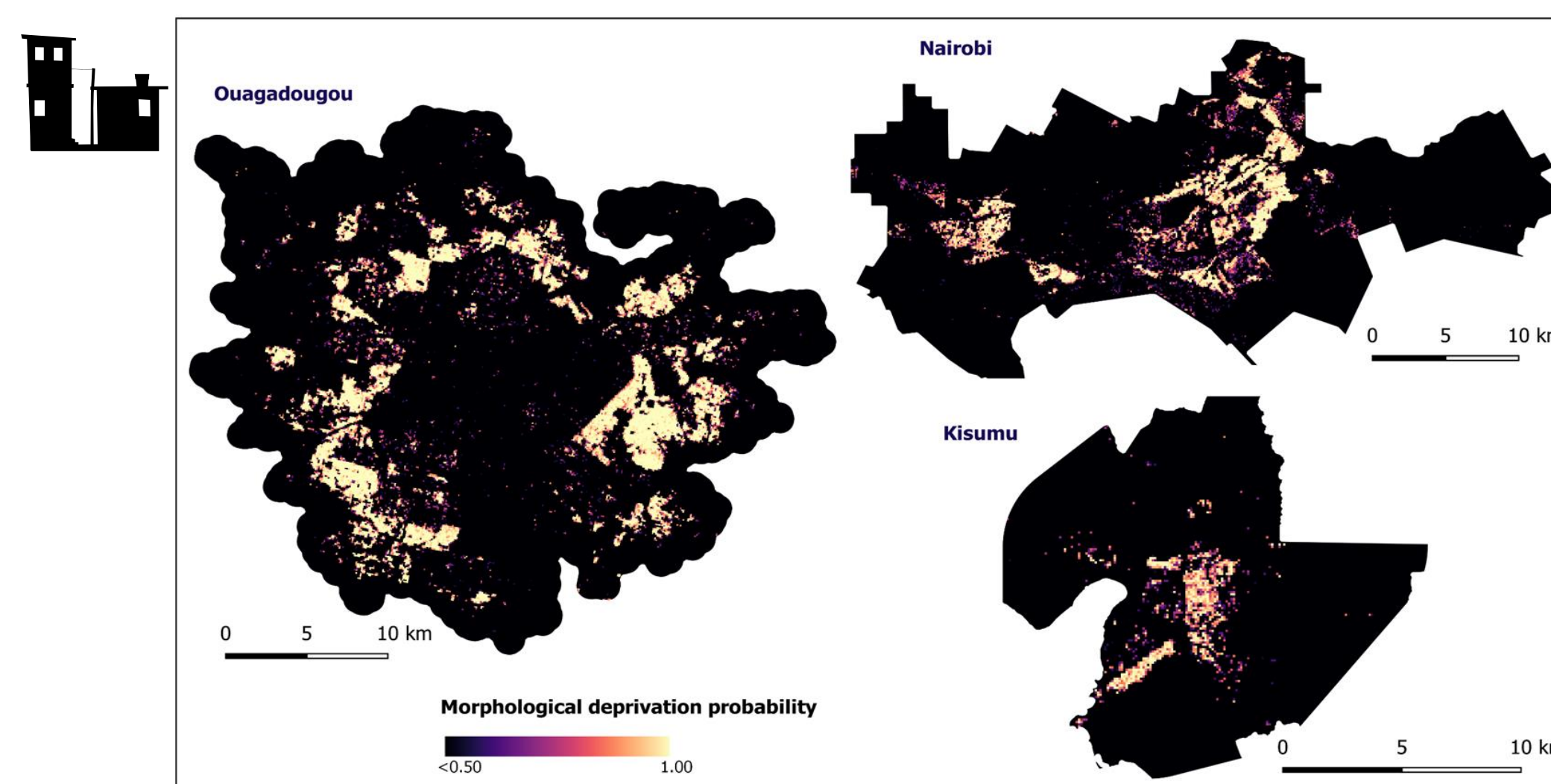
POPULATION



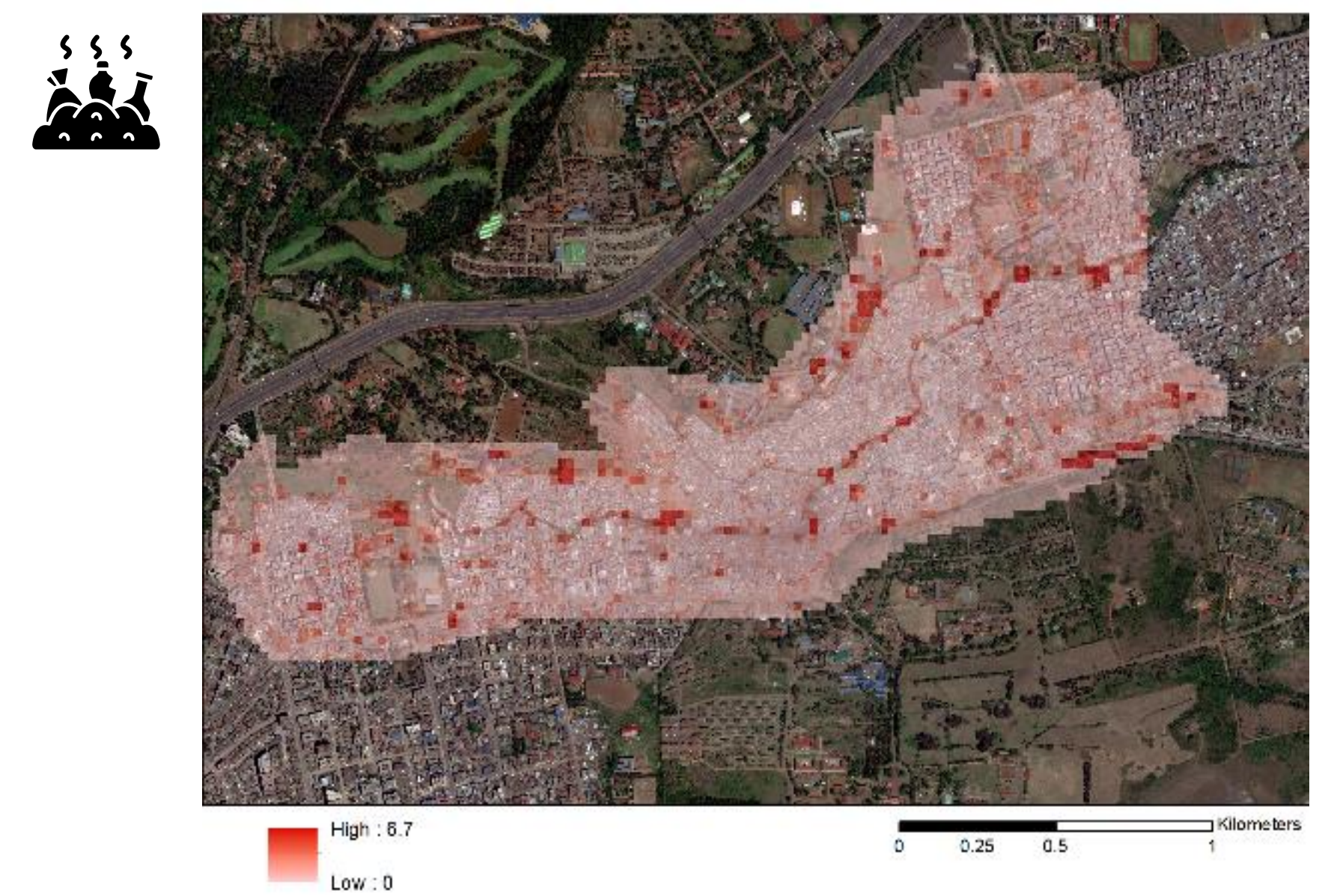
THERMAL EXPOSURE



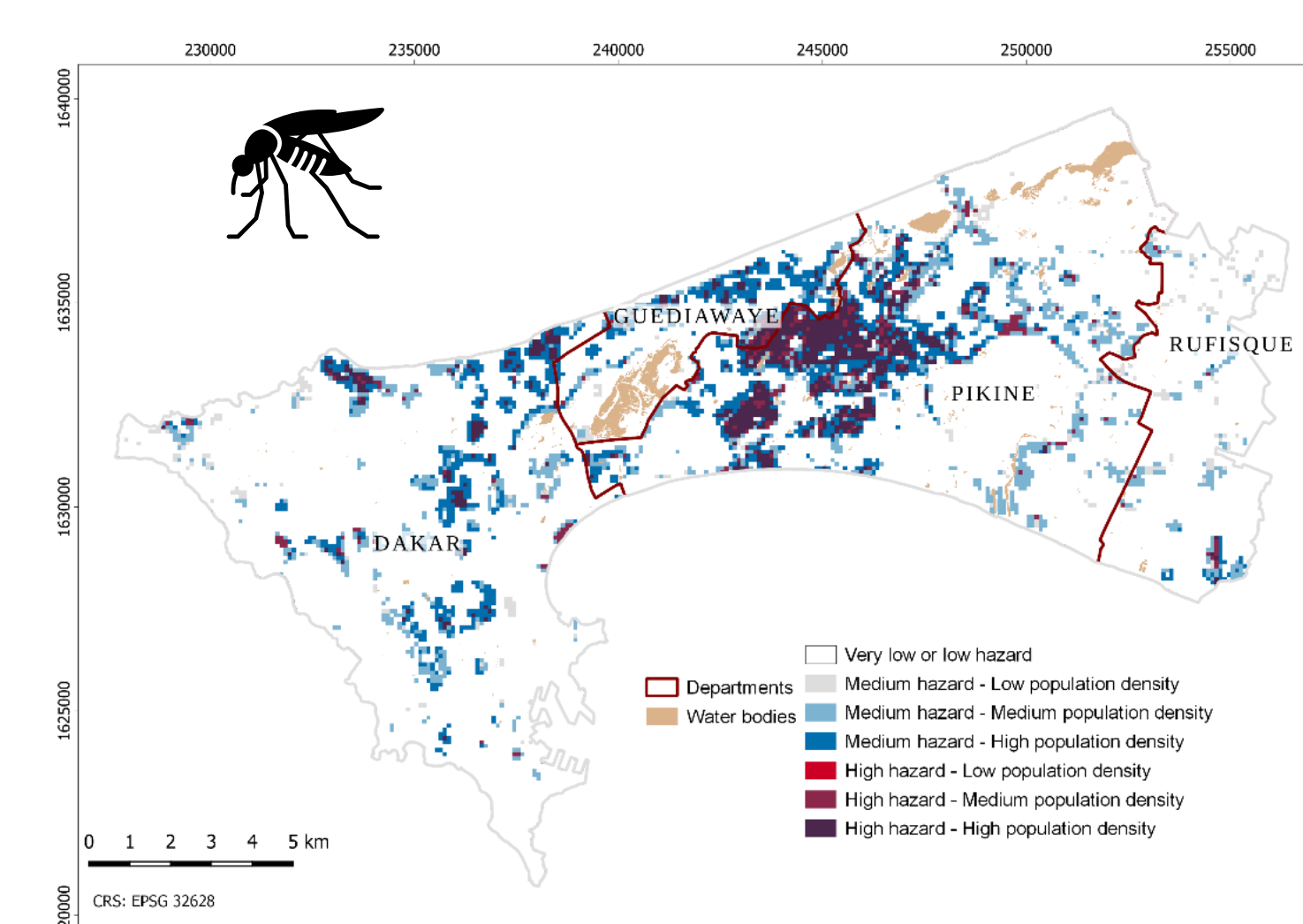
DEPRIVATION PROBABILITY



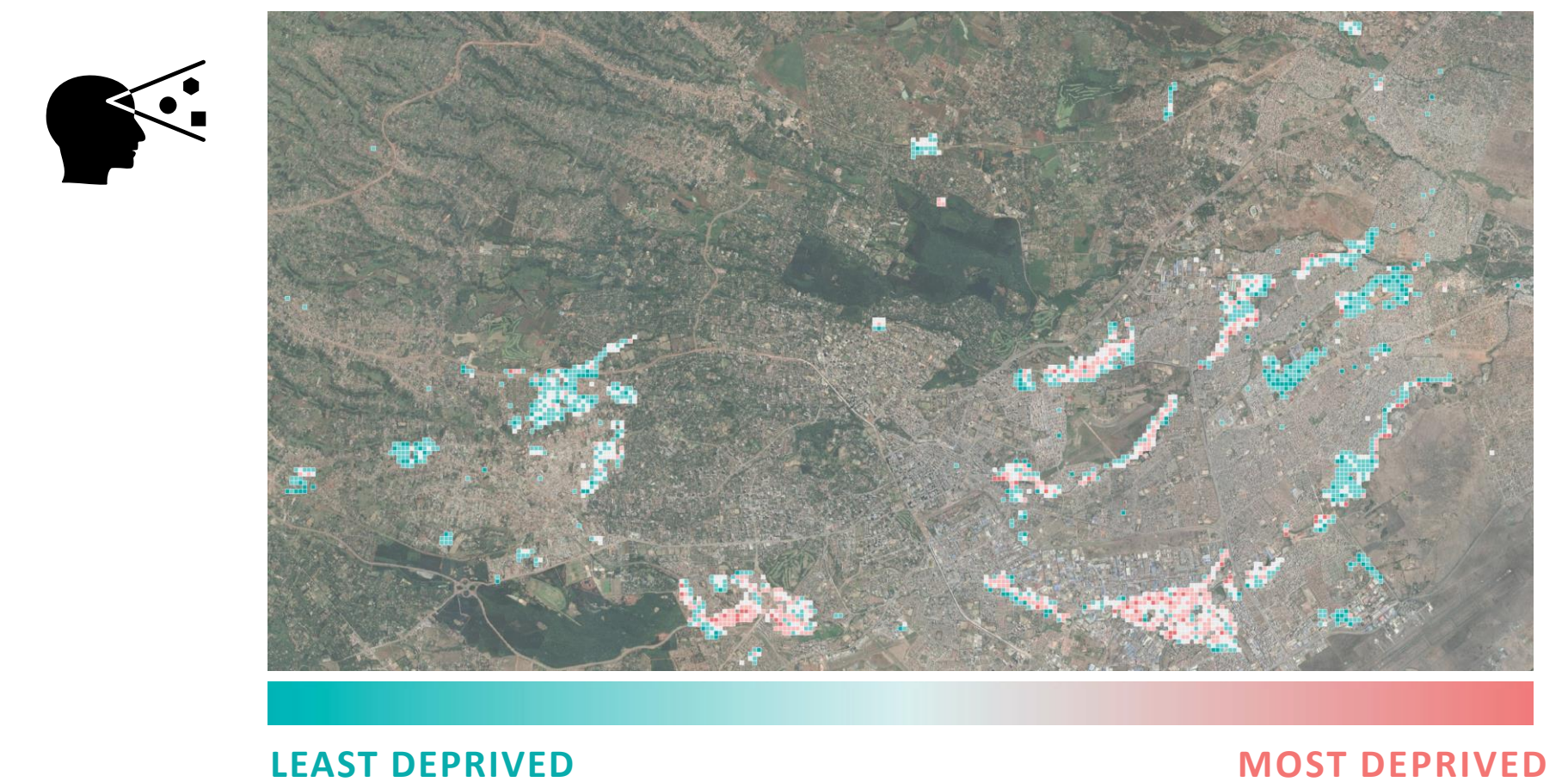
SOLID WASTE



VECTOR-BORNE DISEASES



HUMAN PERCEPTION



④ CONCLUSION

- Earth Observation, AI, and geospatial methods are key to providing quantitative spatial knowledge to tackle urban challenges in Africa
- They underpin essential tools and frameworks to support sustainable development with the aim of creating more resilient and equitable urban environments
- Through various applications, we aim to bring geospatial research output closer to effective support tools for evidence-based policies and targeted interventions



5 MORE INFORMATION



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