IDEAtlas - GeoAI for mapping Urban Deprivation

Organization: Academia
Data Type: Citizen data, Geospatial data, Artificial Intelligence, Data for SDG monitoring
Region: Global
Timeline: For the World Data Forum we can provide, models and user guides.
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Sponsoring Organization:

University of Twente

Supporting Organization(s):

Objective:

The IDEAtlas EO solution uses a lightweight Multi-Branch Convolutional Neural Network (MB-CNN) to detect and characterise informal settlements and model deprivation. The model fuses multi-modal inputs, including Sentinel data and built-up density layers (no-cost data), achieving high accuracy in cities where morphological characteristics are distinct, with an accuracy of around 80%. The platform delivers:

- **City-scale maps of informal, formal, and non-built-up areas (at 100 m grid resolution).**
- **Slum severity index derived from EO and ancillary geospatial data (0–1 deprivation scale).**
- **City-level metrics: population living in informal settlements, area of deprived settlements, and temporal trends (2019–2023).**
- **Multi-temporal change detection to track expansions, demolitions, and shrinkages.**

Description:

Approximately 1.1 billion urban residents in Low- and Middle-Income Countries (LMICs) continue to reside in Deprived Urban Areas (DUAs), areas that lack access to adequate housing, essential services, and protection from environmental and economic risks. Yet, governments face critical data gaps in monitoring progress toward SDG 11.1.1 – the proportion of the urban population living in slums, informal settlements, or inadequate housing. Traditional data sources, such as censuses, are often outdated, aggregated at coarse administrative levels, or do not accurately reflect their dynamics. As a result, policy decisions related to housing, upgrading, disaster risk reduction, and service provision remain poorly informed.

The IDEAtlas project demonstrates that Earth Observation (EO) and Artificial Intelligence (AI) can provide timely, consistent, and scalable spatial intelligence to bridge these data gaps.

We are happy to provide the IDEAtlas datasets and models for the commitment to the data initiative.

We will monitor the progress via the use of our data portal https://portal.ideatlas.eu/ and the increase in the number of cities mapped.

We will provide annual updates in the form of short reports.