



Urban
Big
Data
Centre

IDEA
MAPS
Network

Beyond VGI:

Participatory validation and the institutional uptake of Open Geospatial Data

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Community/grounded Validation is not simply a quality-control step. It is a potential mechanism for making open geospatial data credible, interpretable and potentially actionable for institutions.

If NMCAAs pretend to become data integrators, beyond validation (yet VERY VERY important) – there are institutional problems to be solved

Outline

1. What is IDEAMAPS?

A co-created, participatory data ecosystem for mapping urban deprivation across the Global South — built on four principles: grounded, transformative, transferable, feasible.

2. IDEAMAPS Validation

An 8-step framework — Define → Interpret → Engage → Validate → Capture → Re-locate → Iterate → Open — built through Participatory Action Research.

3. The Colombian Case

Re-locating the model to Pereira & Pasto: credible, participatory data meets institutional barriers to uptake.

4. Final Thoughts

“slum” mapping approaches

Field Mapping

using GPS or drawing on printed imagery. Often performed by residents to generate data for planning and advocacy.



Computer models

using AI or machine-learning methods and satellite imagery. Requires training data of slum/non-slum areas.



Census & Survey

approaches use household-level data to classify “slum” households, then aggregate. An area with >50% “slum” households is a “slum” area.



Digitising imagery is

done manually in GIS software, sometimes by a person unfamiliar with the local context. Digitized imagery is often used to train computer models.



To co-create an integrated **data ecosystem** that enables **routine, accurate** mapping of slums, informal settlements, and other deprived areas across LMIC cities

Pilot cities: Lagos, Kano (Nigeria) and Nairobi (Kenya)

Expansion cities: Beira (Mozambique), Kisumu (Kenya), Abuja (Nigeria), Accra (Ghana), Harare (Zimbabwe), Katmandu (Nepal), Pasto & Pereira (Colombia)

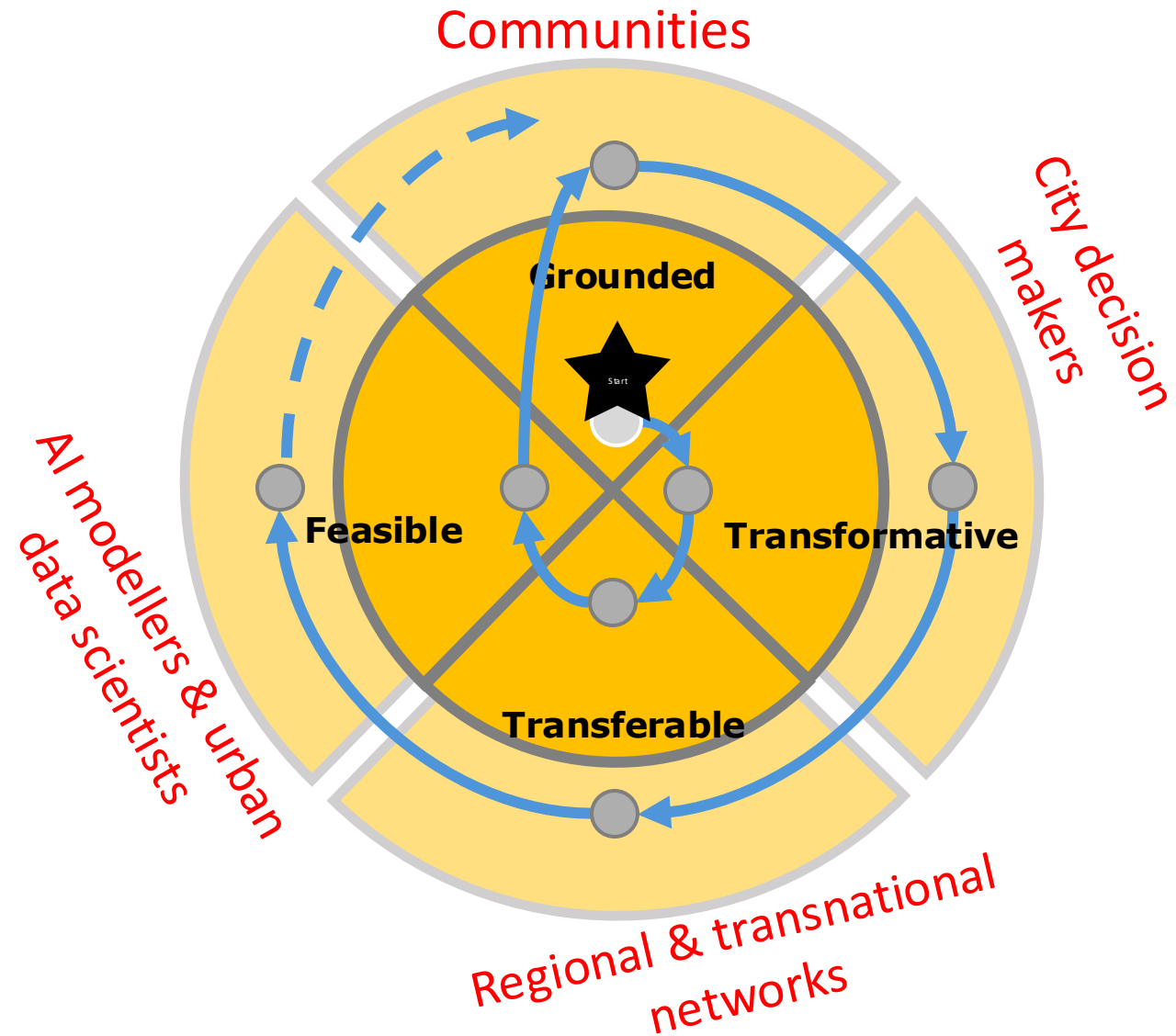
www.ideamapsnetwork.org

Concept paper: <https://doi.org/10.3390/socsci9050080>



Principles of justice-oriented data Ecosystems:

Double Loop Co-Creation Process



- **Grounded:** models must be grounded in the perspectives, priorities and worldviews of the disadvantaged people whose situations they intend to represent (i.e., the “data subjects”).
- **Transformative:** model outputs should be actionable by enabling policy and decision makers to take concrete steps towards improving living conditions for disadvantaged urban residents.
- **Transferable:** Urban models should be useful for addressing injustices in a variety of urban contexts.
- **Feasible:** To harness the power of Artificial Intelligence and Earth Observation, urban science models need to be computationally feasible and leverage suitable technological frameworks.

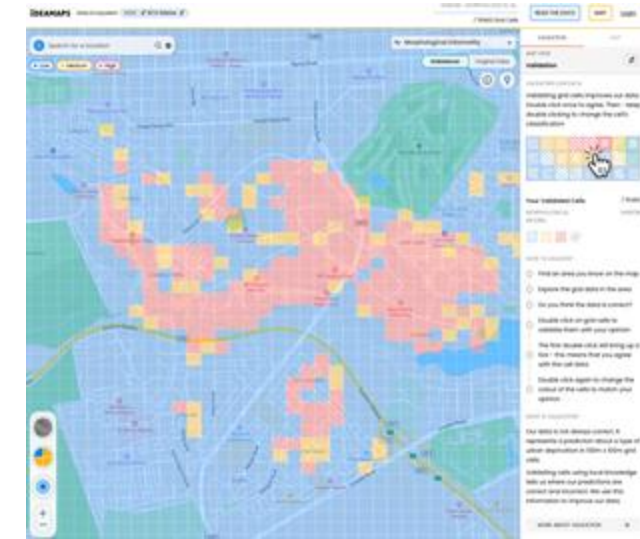
Data ecosystem: participatory modelling process

Model outputs and specifications are discussed and validated with community members, local government and international stakeholders

1. Codesign and Implementation

2. Validation

3. Improvement



Models are co-designed with domain experts, local researchers and stakeholders. Outputs are visualised online at IDEAMAPS platform.



Quantitative data from user interactions in the platform are analysed together with qualitative feedback to determine improvements.

Participatory Action Research - PAR

This method allow researchers and communities to deeply explore and dialogue about the issues around urban deprivation.

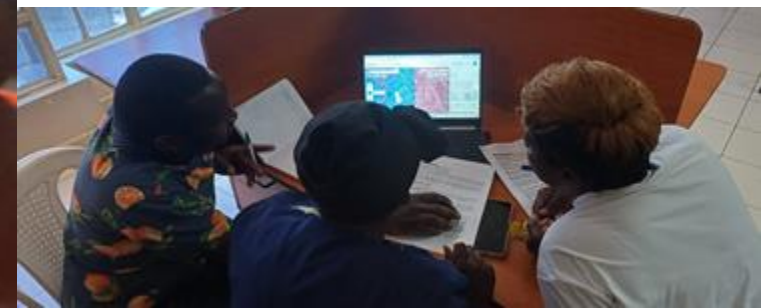
List and rank community **priorities/subdomains** (i.e., health care, WASH, drinking water, etc.)

Define, identify and map **community assets** (i.e., streets, facilities)

Model **validation** (e.g., is it representative? Does data describe the underpinning realities?)

Capacity building (e.g., improving data and map literacy, develop technical skills)

Draft community **action plans**



what does "validation"
actually require?

An overview of validation:

Define:

Validator must be able to identify the “object”

- Morphology, Access, accumulation

Interpret:

Validator must understand how the “object” is defined

- Slum/non-slum, low/medium/high

Engage:

Provide a low-barrier interaction mechanism

- Non-technical users, No GIS skills required

Validate:

Well structured recording and interaction

- Click (agree), double-click (disagree/change)

Capture:

Contextual qualitative data during the session

- Facilitation and notes taken

Iterate:

Incorporate feedback in the process

- Validation feed new model versions

Re-locate:

Adapt the approach to different contexts

- Additional domains and new cities

Open:

Make results discoverable and usable

- Zenodo and github as repositories

An overview of validation:



Domains or Deprivation paper:

<https://doi.org/10.1016/j.compenvurbsys.2022.101770>

Define:

Validator must be able to identify the “object”

- Morphology, Access, accumulation

- ✓  Road Access Deprivation
- ✓  Accumulated Waste Piles
- ✓  Flood Hazard
- ✓  Emergency Obstetric Care ...
- ✓  Morphological Informality
- ✓  General Healthcare Access...
- ✓  Drinking Water Access Dep...

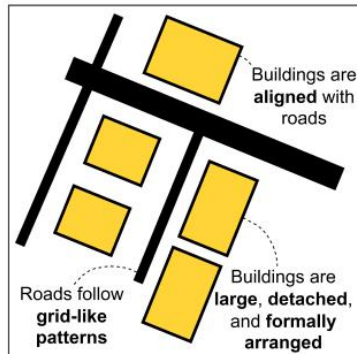
Interpret: Validator must understand how the “object” is defined Slum/non-slum, low/medium/high

A lay definition of morphological informality:

This dataset represents the difference between planned and unplanned areas of the city as indication of urban deprivation. Areas with higher levels of morphological informality are related to more deprived areas

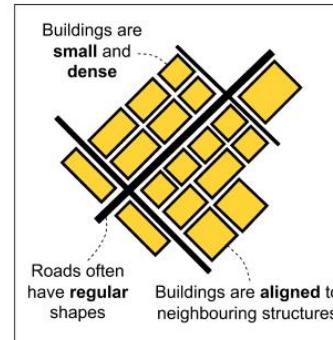
Low

Buildings are larger, detached from one another, and regularly arranged. It is easy to visualise roads, pathways, or open spaces between them. Areas with no buildings are also categorised as low.

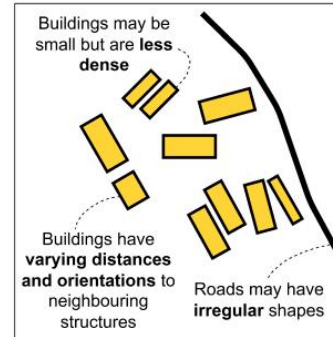


Medium

Buildings are small and close together (it can be hard to visualise roads, pathways, or spaces between them) OR buildings are irregularly arranged (with varying alignment to neighbouring structures). Roads are moderately present.

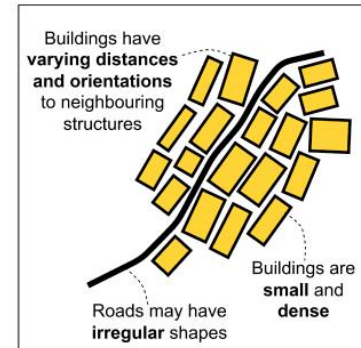


OR



High

Buildings are small and close together AND buildings are irregularly arranged (with varying alignment to neighbouring structures). Roads are hard to visualise or they are absent.

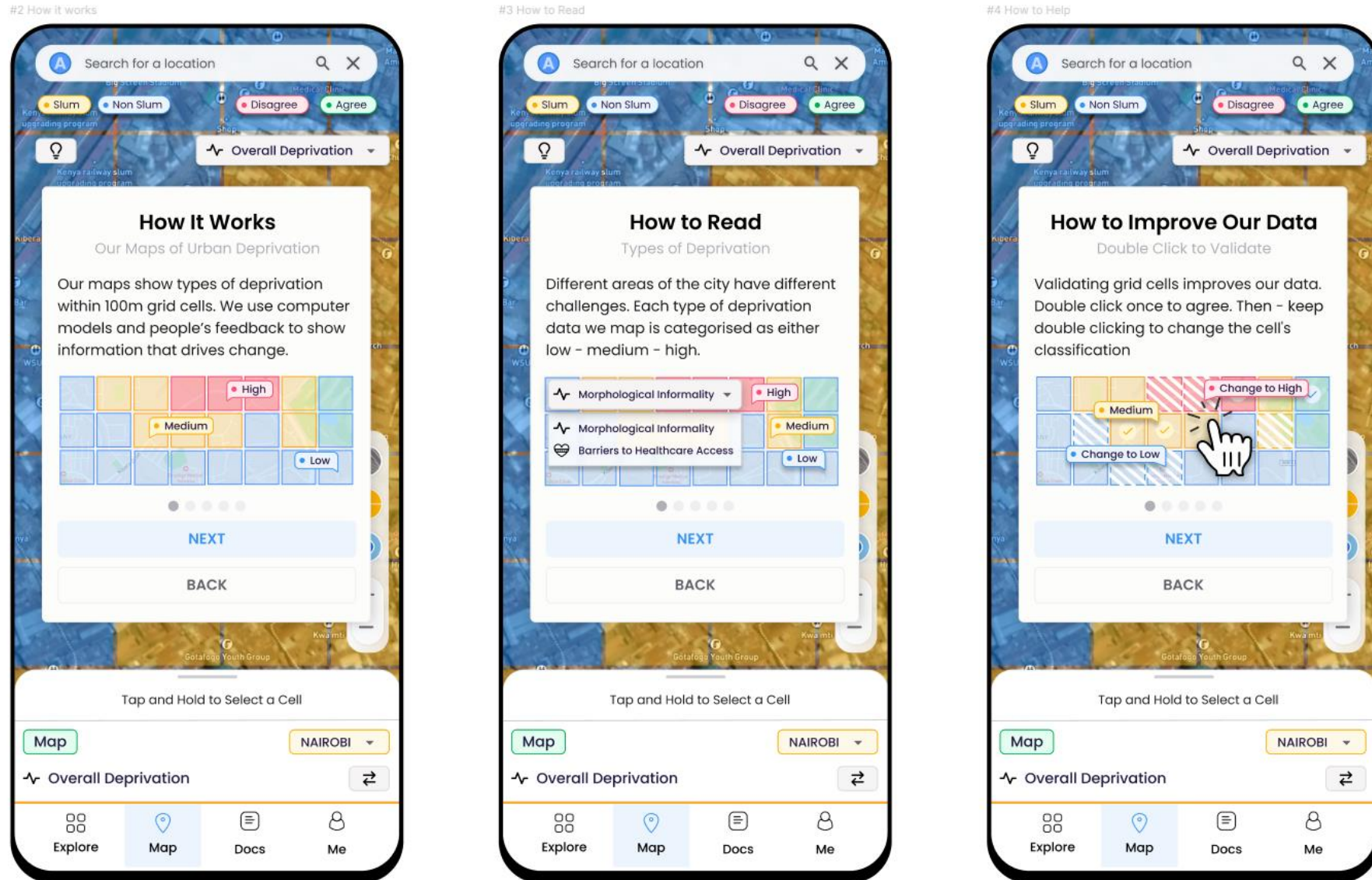


Engage:

Provide a low-barrier interaction mechanism

- Non-technical users, No GIS skills required

Full onboarding of the validation process



Outcomes from PAR sessions

Validate:

Well structured recording and interaction

- Click (agree), double-click (disagree/change)

Capture:

Contextual qualitative data during the session

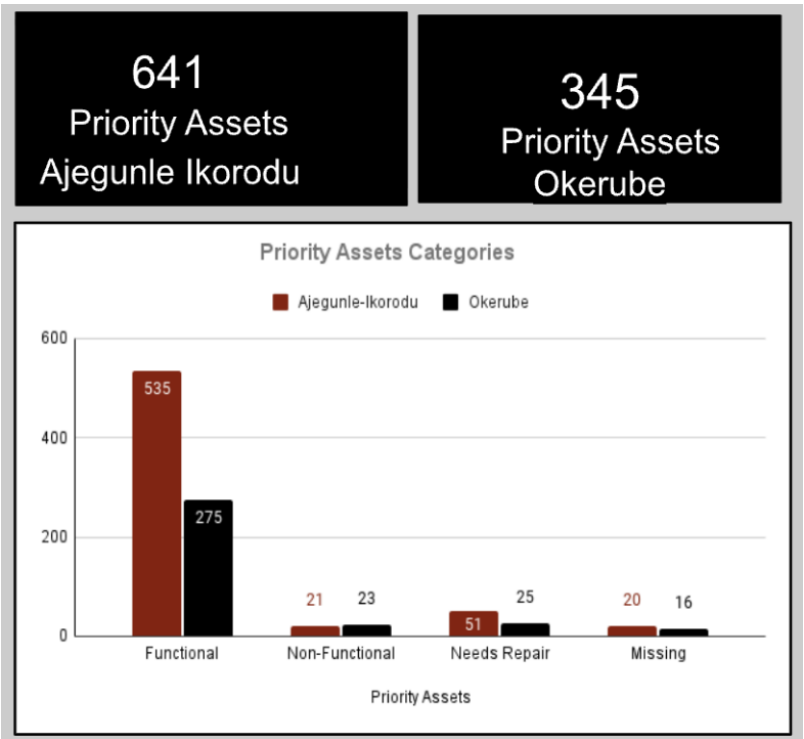
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“At the end of the day we want to see Okerube as a community on the map”

“We would love ideamaps to do boundary mapping of our community so that Okerube will reflect on the map”.

“The community leaders have invited me like 3, 4 times , that they want to see Okerube as a community”.

“The mapped data is really useful, because it promotes businesses, makes the community more accessible, if one is looking for something/somewhere, and the community is a bit more developed”.



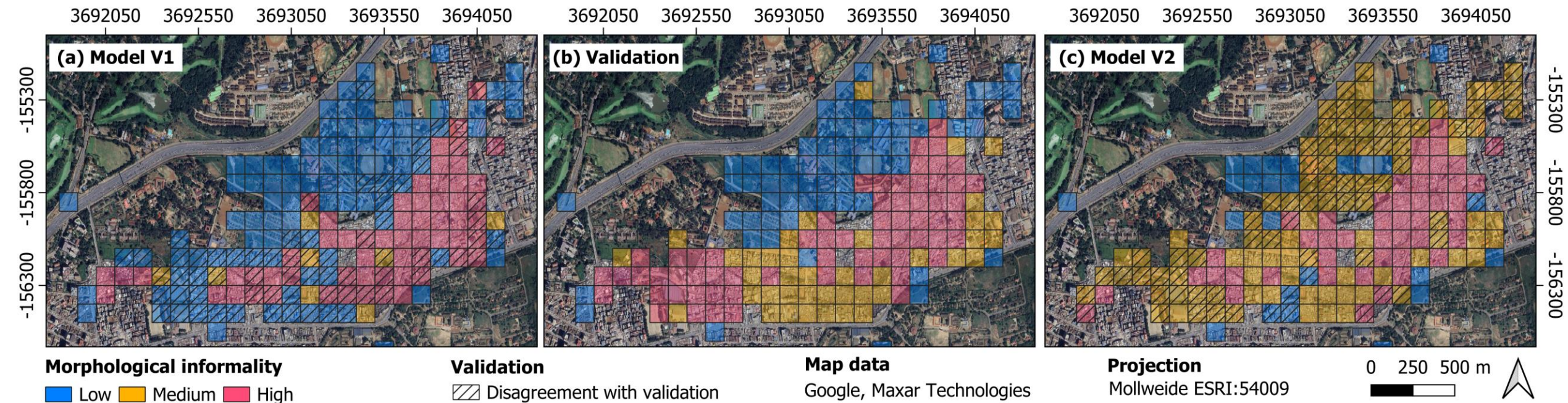
COMMUNITY	PRIORITIES OVERLAP BETWEEN GOVERNMENT & COMMUNITY	EXPECTED OUTCOME
Ajegunle-Ikorodu	• Road Network • Health Centers • Religious Facilities • Commercial Facilities • Water Facilities • Power • Transportation Facilities	Data Sets on the community assets and others presented in shapefiles can be overlaid on the State’s Spatial Data Infrastructure

Iterate:

Incorporate feedback in the process

- Validation feed new model versions

Validations incorporated and model fitting



Acknowledged contributions & open access

Open:
Make results discoverable and usable

- Zenodo and github as repositories

My Location

Your City to Map *

We operate in a small number of pilot cities. Choose one to start mapping.

Kano

GPS Data *

We'd like to use your location data to improve our modelling process and your experience using the app.

No



Data Sharing

Notifications *

We'd like to send you notifications about new activity in your city.

No



Share Statistics *

Help improve our services by sharing statistics on your app usage

Yes



Contributor Attribution *

We'd like to publish your display name as part of validation packages we share with our community.

No



Data Ecosystem
IDEAMAPS

Briefing on the Priorities of Communities and City Decision-Makers in Nairobi, Kenya

1. SUMMARY

This document provides a summarised briefing on the insights from Participatory Action Research (PAR) activities of the IDEAMAPS Data Ecosystem project in Nairobi, Kenya. These insights are based on what we have heard and collated from two partner communities in Nairobi - Korogocho (Ruaraka Sub-County)¹ and Viwandani (Makadara Sub-County)² – alongside other city stakeholders.

Overview

In Nairobi, there are challenges with access to water, sanitation, and hygiene (WASH) facilities, which are a cornerstone of public health and well-being. These challenges are especially pronounced in informal settlements, where inadequate infrastructure, overcrowding, and socio-economic barriers hinder the



Figure 1: Map of Korogocho showing the location of the study area.

zenodo



Acknowledgment: This Guide was generated as part of the IDEAMAPS Data Ecosystem project and the authors acknowledge the contributions from the stakeholders and partners communities in Lagos (Nigeria), Kano (Nigeria) and Nairobi (Kenya): Kehinde Baruwa, Andrew Mitham-Clarke, Ryan Engstrom, Grace Gielink, Serkan Girgin, Angela Abascal, Caroline Kabaria, Monika Kuffer, Sebastian Hafner, Oluwatoyin Odulana, Francis Onyambu, Grant Tregonning, Qunshan Zhao, Alexandra Middleton, Mingyu Zhu, Darren Dixon

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African Population and
Health Research Center



IDEAMAPS Expansion Colombia – Pilot Engagement (Pereira and Pasto)



1. WHEN WE WE STARTED

- Engagement started in **Late 2025**.
- Rolled out through IDEAMAPS networks and local connections.
- Initial contacts established with national and local institutions.



2. WHO WE ENGAGED

- National level:** Ministry of Housing and related entities.
- Local level:** Municipalities in Pereira and Pasto.
- Regional level:** Department government.
- Academia:** Universities and researchers.



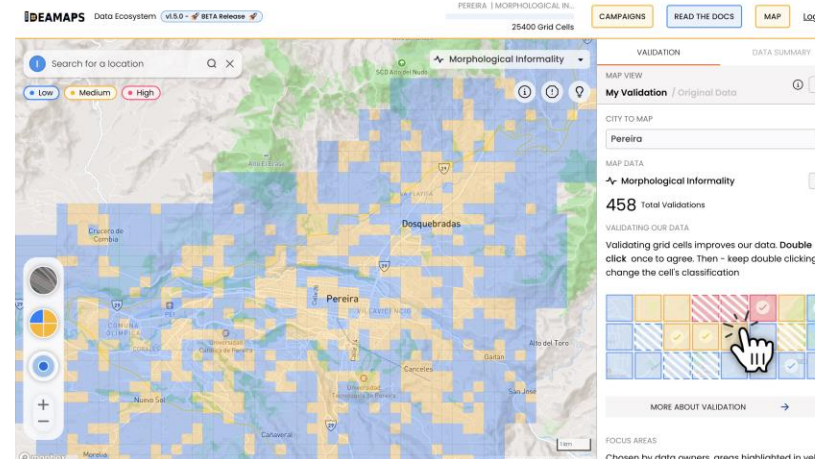
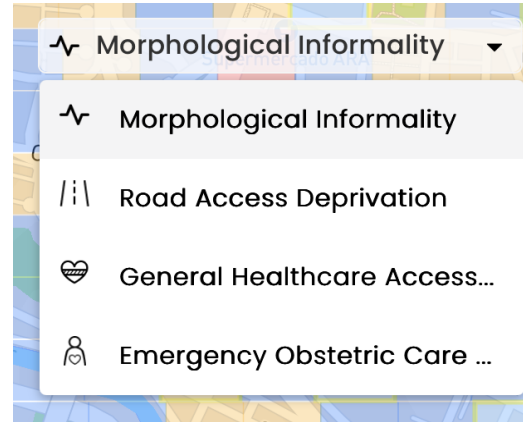
3. HOW WE ENGAGED

- Meetings and presentations of the IDEAMAPS approach.
- Discussions on methods, data needs and potential applications.
- Presentation of initial outputs and platform capabilities.
- Continuous engagement and follow-up.



4. WHAT WE OBSERVED

- Strong one-to-one interest and curiosity about the methods and models.
- Product and methodology well received at the individual level.



Re-locate:

Adapt the approach to different contexts

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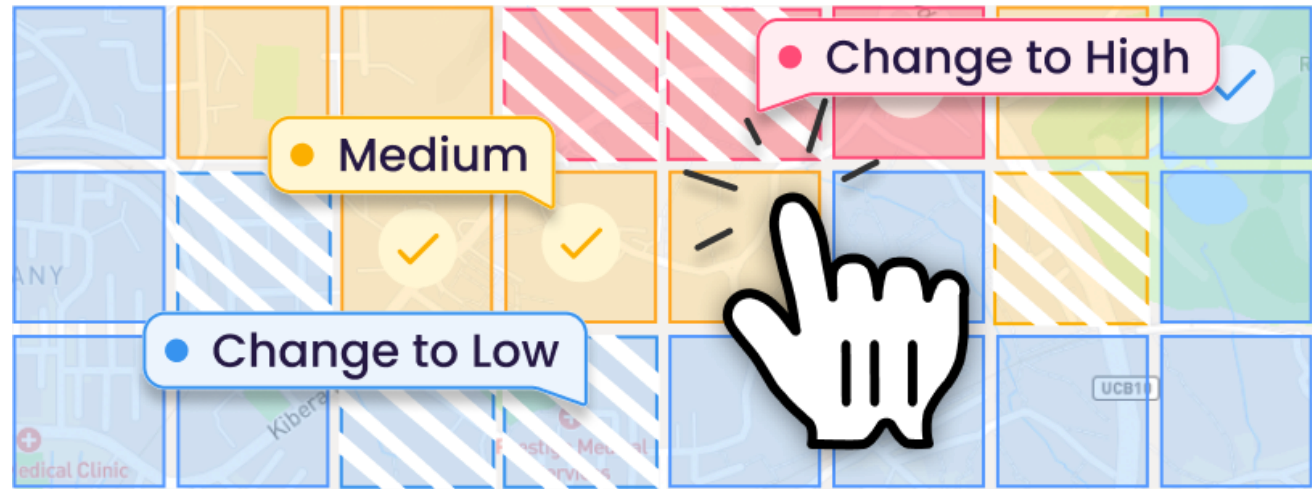


IDEAMAPS approach is centred on co-creating with communities geospatial information on deprivation.

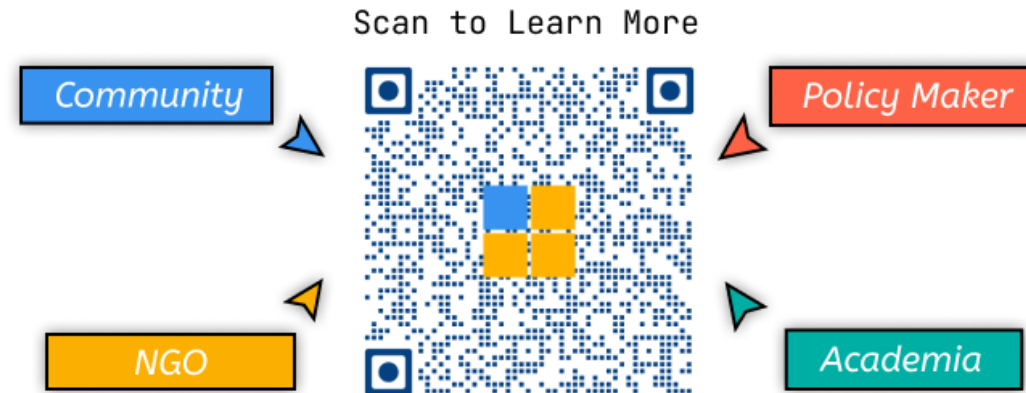
The question is: what **institutional** arrangements allow that information to become recognised and used?

Moving beyond VGI

1. **IDEAMAPS Data Ecosystem enables visualisation and validation** of geospatial data on urban deprivation. The project **situates knowledge** as part of a production/research process in environments with **limited data literacy from low- and middle-income countries**.
2. **Validation** is more than checking accuracy. It is a structured process that includes **defining, interpreting, questioning, agreeing, disagreeing and explaining** a spatial representation. For validation to matter, **it must impact data or modelling**.
3. IDEAMAPS demonstrates that **a participatory research process can be embedded in tech**. It has **been tested and has generated an open and reproducible approach** that combines modelling, visualisation and participatory validation that **conventional data may struggle to capture**.
4. But **transferring the methodology is not the end** of the story. Colombia showed that a methodology can generate interest, engagement and credible data, while **still encountering institutional barriers to uptake**.



IDEAMAPS DATA ECOSYSTEM



V 1.0.0

Explore & Validate Data About
Urban Deprivation & Assets



Thanks!

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