Building a geodata community in a data scarce context

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and

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- Charlotte Flasse
- Eleonore Wolf
- Monika Kuffer
- Jon Wang
- Serkan Girgin
- Caroline Gevaert
- Claudio Persello
- Diviany Kohli
1 – What is the IDEaMAP Network?

- The IDEAMAPS Network aims to develop and maintain an Integrated DEprived Area MAPping System that leverages the strengths of our current silo-ed approaches to "slum" area mapping.
An implementation of the IDEaMAP concept that ran from 2020 to 2023

Focused on Khartoum, the capital of Sudan
3 – Motivation, the case of Khartoum, Sudan

- Missing/incomplete capacity and resources.
- Outdated resources.
- Fragmented coordination among government institutes and with relevant actors.
- Ineffectively saved and archived
- Not shared/isolated working culture and technical capacity
- Lack of spatial data/represented geographically
- Data not used for policy and decision making
4 – The institutional landscape

Sponsor

**nuffic**

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Beneficiaries

Ministry of Transport

Ministry Of Planning - Khartoum State

Ministry Of Social Development

Implementing Organizations

**Faculty of Geo-Information Science and Earth Observation, Netherland**

**Sudan Urban Development Think Tank (SUDTT), Sudan**

**Université Libre de Bruxelles, Belgium**

**African Population and Health Research Center, Kenya**
5 – The team

Trainers and Coordination
ULB - APHRC - ITC

Local coordinator

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Assistant Professor

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Assistant Professor

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Researcher

PROF. DR. JR. C. PERSELLO (CLAUDIO)
Associate Professor
6 – Objectives of IDEaMAP Sudan

6.1 Develop a model for mapping deprivation - Khartoum State as a study area;

6.2 Train a group of young professionals (TOT) to co-create and use spatial data on deprived areas to frame an ‘Integrated Deprivation Area Mapping System’;

6.3 Knowledge transfer and raise awareness about the importance and benefits of geospatial data

6.4 Develop IDEaMAPSudan database system
Poverty is a complex concept and should not be reduced to only income poverty.

The concept of deprivation understands poverty as a multi-dimensional phenomena beyond income poverty.
6.1 – Understanding a deprivation

- Deprivation is a Multi Dimensional Concept
- Households might be deprived in terms of durable housing material or access to basic services (e.g., water, education,..).
6.1 – Understanding a deprivation

▪ Deprivation is a Multi Dimensional Concept

▪ Communities might be deprived in terms of infrastructure or availability of open spaces.
6.1 – Understanding deprivation

- When several factors of deprivation are identified in a specific area it will suffer from a high level of deprivation.

Most of the times we do not have easy access to data or adequately analysed data to reveal the complex geographic patterns of multiple deprivation.
DOMAINS OF DEPRIVATIONS
IDEAMAP FRAMEWORK
Combining Geospatial Datasets to Conceptualize Deprivation
6.1 – Developing a deprivation map

- Deprivation framework and indicators
- Data collection
- Data Analysis: Developing of the indicators and domains maps
- Weighting of indicators
- Model development / combined deprivation map

- Using Open data sources, OSM...
- Combining digital innovations with local knowledge
FACILITIES & SERVICES

INFRASTRUCTURE

UNPLANNED URBANIZATION

PHYSICAL HAZARDS & ASSETS

SOCIAL HAZARDS & ASSETS

CONTAMINATION
6 – Training of Trainers (ToT)

The **online course on basic methods of working with spatial data**: GIS principles and EO principles. The course covers an introduction into software to work with GIS and EO data.

**Community-based data collection (APHRC, Kenya).** This one-week training in Nairobi (Kenya) on community engagement in deprived areas, packaging data with and for decision-makers, and sustaining quality, routine spatial data creation.

**Set-up of an initial spatial databases for IDeAMapSudan (online)** and learn how to design and carry out sequential data processing steps for the creation of spatial databases with open-source tools to support urban planning and management.

**Co-designing of IDeAMapSudan (ITC, The Netherlands):** technical creation of a data ecosystem and the contextual design and information need and requirement analysis.
### 6.2 – Training of Trainers (ToT)

<table>
<thead>
<tr>
<th>GIS main learning topics</th>
<th>EO main learning topics</th>
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<tbody>
<tr>
<td>1. Community-based mapping</td>
<td>1) Using open source data for guiding mapping</td>
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<tr>
<td>2. Application for community-based mapping</td>
<td>2) Collecting reference data</td>
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<td>3. Fieldwork</td>
<td>3) Integrating data with existing dataset</td>
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<td>1. Accessibility analysis</td>
<td>1) Advanced image analysis Caroline G.</td>
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<tr>
<td>2. Modelling urban growth using spatial statistical techniques Monika</td>
<td>2) Combining machine learning with OBIA Charlotte</td>
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<td>3. Hazard (e.g., flood) modelling</td>
<td>3) Introduction to Google Earth Engine / Cloud computation and scripting Claudio</td>
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<td>4. Socio-economic and population modeling (e.g., hedonic price models) Monika</td>
<td>4) Mapping deprived urban area Sabine/Monica</td>
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<tr>
<td>5. Web Mapping &amp; Geoweb services</td>
<td>5) Introduction to deep-learning Claudio</td>
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<td>6. 3D models and analysis</td>
<td>6) Building mapping with deep learning Claudio/Jon</td>
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<td>1. Data base set tbd</td>
<td>1) Big data analysis tbd</td>
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<td>2. Web-based data services tbd</td>
<td>2) Modelling uncertainties Caroline G.</td>
</tr>
<tr>
<td>3. App development tbd</td>
<td>3) Drone based mapping Caroline G.</td>
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6.2 – Training of Trainers (ToT)

- QGIS
- GRASS GIS
- GeoDa
- Qfield
- OSM
- Kobo collect
- Field papers
- HOT Tasking manager
- GeoNode
6.3 – Community workshops: Non-GIS people

**Targeted group:** Participants from relevant Government institutes and NGOs, who do not have prior knowledge of spatial data or map reading

**Workshop outcomes and learning objectives:**

By the end of that workshop, participants were able to:

- Acquire insights about data types.
- Understand spatial data and explain how geographic phenomena can be represented as spatial data.
- Access existing spatial applications and know how to display and identify geographical objects on maps.
- Collect of spatial and survey data using innovative tools downloadable on smartphone or tablets.
6.3 – Community workshops: GIS Specialists

**Targeted group:** Participants from relevant Government institutes and NGOs specializing in geographic information systems

**Workshop outcomes and learning objectives:** By the end of that workshop, participants were able to;

- Understand the Concept of Spatial Data Modelling.
- Understand what is data validation and dealing with errors.
- Understand the concept of Earth observations methods.
- Modern Geospatial Methods.
6.3 – Community workshops: local communities

**Targeted group:** Activists from different communities and neighbourhoods, workers in voluntary work and NGOs

**Workshop outcomes and learning objectives:** By the end of that workshop, participants were able to;

- Perceive the importance of data and the contribution of the community to data.
- Acquire knowledge about spatial data.
- Understand the concept of multi-level deprivation.
- Access existing open-source spatial applications and contributing to data.
- Collect of spatial and survey data using innovative tools downloadable on smartphone or tablets (i.e. Kobo collect).
6.3 – Knowledge transfer and raise awareness

9 trainers

Non-GIS Workshop (22) ➔ Continuous impact

GIS Workshop (20) ➔ Continuous impact

Community Workshop (27) ➔ Continuous impact
6.3 – Final conference and community visits
6.4 - Data Dissemination

http://geonode.idea-maps.net
7 – Expected (and actual) impacts

▪ New projects were on the pipe. These projects would have been primarily executed by the local experts trained in the context of IDEaMap Sudan;

▪ Some of the ToTs found new career opportunities;

▪ Some of the recipients of the community workshops developed their own internal data acquisition procedures;

▪ Associations and collaborations amongst young university students:
BREAKING
GUNFIRE & EXPLOSIONS IN SUDAN
8 – What mobilizes people?

- Primarily, the sense of community
8 – What mobilizes people?

▪ Be part of something bigger and more important;
▪ Social, economic and/or moral gratification;
▪ Feeling a certain level of control (I can make a difference);
▪ Trust!
▪ Last but not least... **HOPE**
8 – What mobilizes people?

- Try to tap-in into big...
  - A Revolution
  - An election outcome
  - A legislative change
  - A peace agreement

- ... and small moments:
  - A management change
  - An inspiring presence
  - A new project, etc

The higher the hope, the greater the collaboration!
... and what does not!

- Too much direction;
- Tool driven;
- Data driven (aka “data because yes”)
- No immediate gain/compensation;
- No link to loved ones (the community)

Rationality is not enough – people need to feel!
But... what about the data?

- If you have no users, who is the data serving?

Data serves the people, not the other way around
Start with the people!
Thank you ..
IDeAMapSudan Team ..