The Role of Geospatial Data Across the Dimensions of the SDGs

Towards Better Information Systems for the 2030 Agenda

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Facebook Says It Has Created The Most Accurate Population Density Models Ever

Facebook analyzed 14.6 billion satellite images to create the models. It plans on making them available to anyone.

Why Facebook’s Satellite Imagery Analysis Announcement is Important

Yesterday, Facebook announced that they have mapped human population in 20 countries with unprecedented spatial granularity. It might seem odd for a social network to be diving into global population patterns using satellite imagery, but it was done for a practical reason: to figure out the best type of internet to deploy in the developing world. This is a powerful signal to all companies that satellites are about to change how global businesses understand our planet.

Simultaneous advances in commercial satellite technology, cloud computing, and machine learning have enabled a breakthrough in our understanding of the world. Emerging applications for this technological conjunction include real-time monitoring of global deforestation, understanding shipping traffic, and forecasting of food production.
Good decisions are based on solid evidence

• Geospatial and statistical information are a strategic asset in national policy-making and evidence-based decisions.
• Requires consistently accurate, reliable and authoritative data over time.
• Without this data you are ‘data blind’ and ‘information illiterate’
Geospatial information systems

• A geospatial information system (GIS) is able to model real world conditions using defined geographic areas and linear paths; called “features.”
• GIS organizes and structures data into independent layers that can be overlaid and intersected to build data rich models.
• The power of GIS lies in the analysis of data; layers can be viewed together to better understand relationships, patterns and trends.
• Through interacting with interdependent geographic components, GIS can be used to describe virtually anything on, above and below the Earth with in-depth data.
The register of spatial units

Maps

Data

Analysis

Linking tabular data with its real location
The register of spatial units

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Policy making, impact assessment: Catchment area for major airports

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<tr>
<th>Catchment area</th>
<th>Number of inhabitants</th>
<th>Percentage of population</th>
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<td>10 km</td>
<td>751 000</td>
<td>8 %</td>
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<tr>
<td>20 km</td>
<td>2 300 000</td>
<td>24 %</td>
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<td>30 km</td>
<td>3 364 000</td>
<td>36 %</td>
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<td>50 km</td>
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<td>49 %</td>
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<td>100 km</td>
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<td>66 %</td>
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<td>200 km</td>
<td>8 443 000</td>
<td>90 %</td>
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Prospering markets, customer analysis: Access to Retail Trade Areas

1km: 1.4 million inhabitants
5km: 5.9 million inhabitants
10km: 6.9 million inhabitants
30km: 8.7 million inhabitants
50km: 9.1 million inhabitants
Increased importance of ”Where”

- Geospatial statistics will become increasingly important supporting the UN 2030 Agenda for sustainable development.

- It is essential to embed consideration of the ‘Where’ in policy making, the statistical and geospatial community can provide professional support to make policies evidence-based.
Integration of communities

Statistics

Geospatial

Observations

Thematic Areas

Positioning geospatial information to address global challenges
The global statistical community has laid the groundwork for the successful monitoring and realization of this new agenda.
17 Goals

169 Targets

230 Global Indicators

Official Aggregation and Integration into Indicator Framework by National Statistical Offices. Captures data integrity and validation.

SDG metrics for measuring and monitoring progress. Data compiled and disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location, etc.

Global Outputs and Reporting

National Data Integration

National Information Systems

Data Inputs

Fundamental baseline data and new data sources

Earth Observations and Monitoring
- Imagery
- Water/Ocean
- Land use/cover
- Observations
- In situ monitoring
- Air/Pollution
- Ecosystems
- Forest/Agriculture
- Climate

National Spatial Data Infrastructure
- Geodetic positioning
- Elevation
- Topography
- Land use & cover
- Transport/Infrastructure
- Cadastre/Parcels
- Water & Oceans
- Cities & Settlements
- Administrative Bdy.

National Statistics, Accounts, Administrative Registers, Demographics
- Population
- Demographics
- Poverty
- Trade/Business
- Environment
- Labour/Economics
- Agriculture
- Disability/Gender
- Civil Registration & Vital Stats.

Other Sources of Data, incl. Big Data
- Mobile phone
- Social media
- Sensors
- Automated devices
- Satellite imagery
- VGI
- Crowd sourcing
- ??

Local to national social, economic and environmental conditions and circumstances
High quality, timely and reliable data

Social
- Society
- Poverty
- Education
- Health
- Population
- Employment
- Water
- Sanitation
- Equality
- Gender
- Governance

Economic
- Well-being
- Cities
- Water
- Energy
- Infrastructure
- Industry
- Sanitation
- Economy

Environmental
- Water
- Seas/oceans
- Land use/cover
- Ecosystems
- Forests
- Agriculture
- Climate
- Biodiversity
- Natural hazards
- Pollution

National Spatial Data Infrastructure

Geodetic
- Elevation
- Water/Ocean
- Land use/cover
- Transport
- Cadastre
- Population
- Infrastructure
- Settlements
- Admin. Bdys.
- Imagery
- Geology/soils
- Observations etc.

Positioning geospatial information to address global challenges
In adopting the 2030 Agenda for Sustainable Development, world leaders agreed that a global indicator framework would be an essential method to measure, monitor and report progress on achieving the 17 transformational Sustainable Development Goals (SDGs) and 169 associated Targets. They also recognized the critical importance of “transparent and accountable scaling-up of appropriate public-private cooperation to exploit the contribution to be made by a wide range of data, including earth observation and geospatial information, while ensuring national ownership in supporting and tracking progress”.

To track progress towards these Goals and Targets, the global indicator framework will also need to capture the multifaceted and ambitious aspirations for the continued development of nations and societies. Effective reporting of progress toward these indicators will require the use of multiple types of data, both what we have in hand - traditional national accounts, household surveys and routine administrative data – and new sources of data outside the national statistical system, namely Earth observation and geospatial information, and Big Data, in general.
## Earth Observation and Geospatial Information Resources for SDG Monitoring

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<th>Sustainable Development Goals</th>
<th>Population distribution</th>
<th>Cities and infrastructure mapping</th>
<th>Elevation and topography</th>
<th>Land cover and use mapping</th>
<th>Oceanographic observations</th>
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