



United Nations
Economic Commission for Africa

Building Fundamental Geospatial Datasets for Sustainable Development Goals in Africa

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INFORMATION MANAGEMENT

Outline

- **Background: ECA Activities, Programmes & Projects**
- **UN-PDF Project Background**
 - **Objective of the project**
 - **Main Activities of the project**
 - **Major Accomplishments**
 - **Policy document on NSDI Implementation in Africa**
 - **Geospatial Datasets Taxonomy for SDGs in Africa**
- **Assessment on Availability of Geospatial Datasets for SDGs**
- **Conclusion**

Background

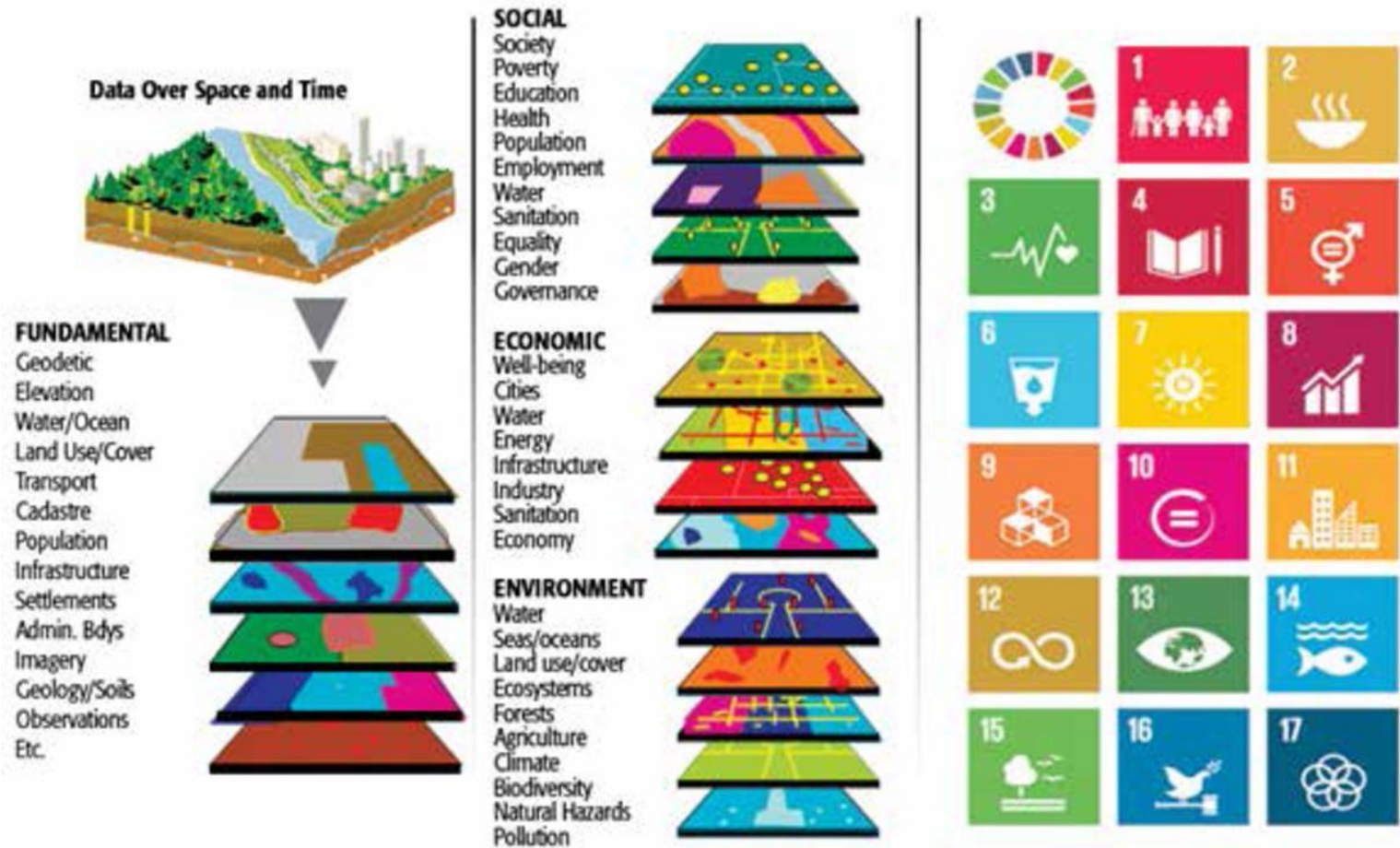
- African Center for Statistics (ACS) of the United Nations Economic Commission for Africa (ECA) focuses on Data and Statistics
- **Objective:** to strengthen the production, dissemination and use of credible data, statistics and **geospatial information** at national, regional and global levels for evidence-based policy and decision-making, planning, implementation, monitoring and reporting for the 2030 Agenda and AU Agenda 2063
- One of the core functions of ACS is **supporting member States in the production and use of timely geospatial data, information and services** for evidence-based decision-making in Africa, tracking SDGs and AU Agenda 2063.

Background

- ECA geospatial information activities include:
 - Harnessing and building geospatial data and information resources **to improve availability and use of spatially enabled data** for informed decision making for addressing national, regional and global development agenda
 - Assisting Member States in the development and implementation of spatial data infrastructures (NSDI), and integrating NSDI with the Integrated Geospatial Information Framework (IGIF)
 - Supporting Member States in the integration of statistics and geospatial information through mainstreaming geospatial technology into National Statistics Offices' activities
 - Advancing holistic geospatial information policies that enable and encourage linkages with international programmes and initiatives, through the UN-GGIM: Africa

Background...

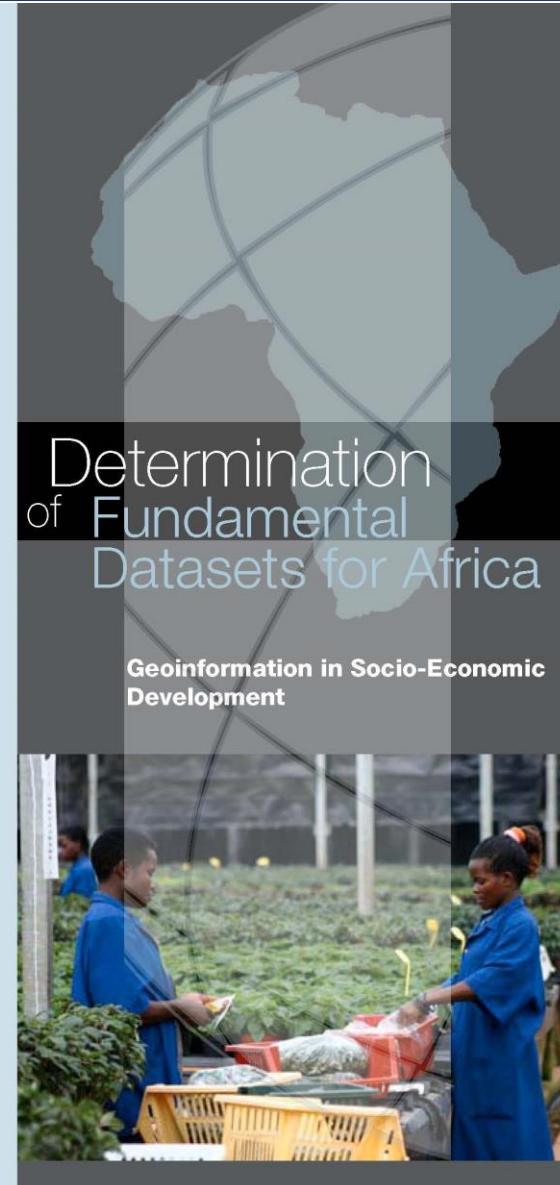
- The relevance of Data, Location Data/geospatial data, is evident to fulfil the responsibilities and mandates of the United Nations, to accelerate the attainment of SDGs and AU Agenda 2063
- **Fundamental geospatial datasets** are crucial for addressing sustainable development in all its dimensions: social, economic, and environmental



Source: UN-GGIM

Background...

- ECA promotes and supports Member States in building fundamental core and thematic datasets in order to make geospatial information readily available and easily accessible
- Identification and Inventory of geospatial datasets is part of the work programme of ECA
- In the past, ECA conducted a study and published document: '**Determination of the Fundamental Geospatial Datasets for Africa**'



Background...

- Recently, ECA conducted a study in the identification of fundamental datasets that are relevant for the SDGs.
- Published, in November 2020, a document on '**Geospatial Data Taxonomy for the Sustainable Development Goals in Africa**' which was prepared with the financial support of the 2030 Agenda for Sustainable Development Sub-Fund of the United Nations Peace and Development Trust Fund (UN-PDF).
- The document is a result of study which conducts an assessment to identify the need for geospatial information at the level of the indicators of the Sustainable Development Goals.

UNPDF Project - Background

- ECA through the Geospatial Information Management Section, ACS, implemented **UN-PDF** project: **‘Strengthening the capacities of ECA Member States to develop geospatial information resources and services in support of the implementation and monitoring of the sustainable development goals’**
- Funded by 2030 Agenda for Sustainable Development Sub-Fund of the **United Nations Peace and Development Trust Fund (UN-PDF); UN-DESA**
- Planned for two years 2019 – 2020; extended due to COVID-19 up to **December 2021**

UNPDF Project - Objective

Objective of the project:

- Strengthening the capacities of selected African countries to **produce, utilize, and manage geospatial information resources and services in support of Sustainable Development Goals (SDGs)**
- To assist beneficiary countries to **develop National Spatial Data Infrastructure (NSDI)**, and to **improve the availability of geospatial information for effective monitoring and implementation of the SDGs**

UNPDF Project Activities

Project main activities include:

- **Development of policy guideline document for the implementation of NSDI in Africa;**
- Organization of regional workshops to discuss the **policy guideline document**
- Organization of regional capacity building workshops to **raise awareness and improve countries capacity** in the production of geospatial information, giving particular emphasis on **the empowerment of young female geospatial professionals;**
- **Development of a technical document on Geospatial Data Taxonomy for Sustainable Development Goals in Africa**
- Development of an **online application** with customized interface for information sharing and access

Policy Guideline for the implementation of NSDI in Africa

Guidelines for the implementation of national spatial data infrastructure in African countries

“Strengthening the capacities of African countries to develop geospatial information services in support of the implementation and monitoring of the Sustainable Development Goals”

Developed with the support of the 2030 Agenda for Sustainable Development Sub-Fund of the United Nations Peace and Development Fund

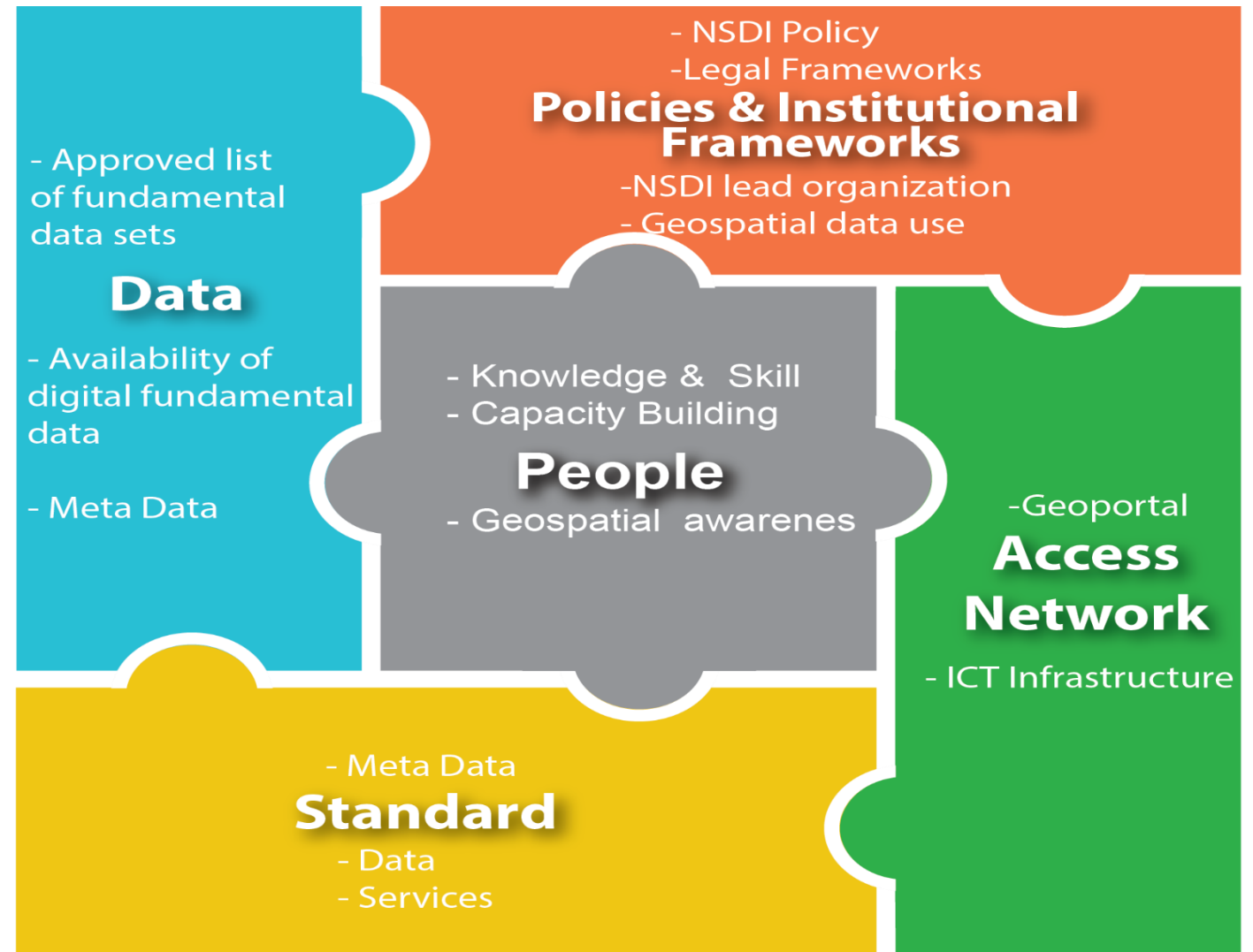
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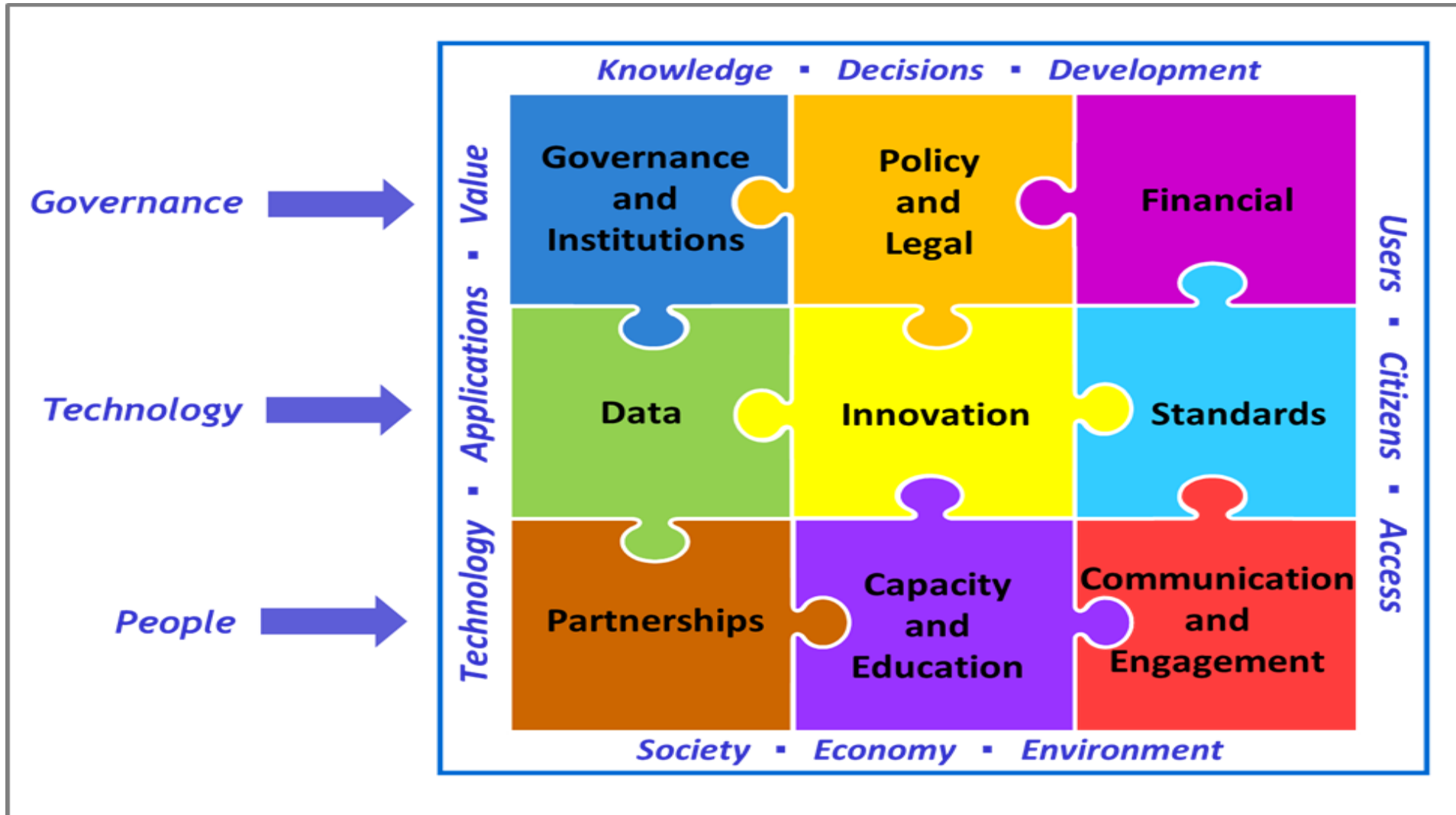
Policy Guideline for the implementation of NSDI in Africa

- **Availability of fundamental datasets** is critical component in the implementation of National Spatial Data Infrastructure
- Policy Guideline focuses on ensuring timely and cost-effective delivery of all five components of spatial data infrastructure with their variables as an outcome of implementation in a country

Components of NSDI



Policy Guideline for the implementation of NSDI in Africa



Policy Guideline for the implementation of NSDI in Africa

- **Organization of five regional workshops on the implementation of national spatial data infrastructure in Africa:** Five regional workshops were successfully organized and conducted for the five sub-regions
 - Addis Ababa, Ethiopia: Eastern Africa -22-25 April 2019 ;
 - Mbabane, Eswatini: Southern Africa - 02-04 July 2019;
 - Abidjan, Cote d'Ivoire: Western Africa - 17-20 February 2020;
 - Central Africa (Virtual) - 03-05 March 2021;
 - Northern Africa (Virtual) - 6-8 April 2021
- **National Stakeholders Engagement Workshops: Burkina Faso and Ethiopia:** supported and funded the organization of national stakeholders' engagement workshop in Ethiopia and Burkina Faso to discuss on the national action plan for the development of **Integrated Geospatial Information Framework (IGIF)**

Geospatial Data Taxonomy for SDGs in Africa



Geospatial Data Taxonomy for the Sustainable Development Goals in Africa

Strengthening the capacities
of selected African countries to
develop geospatial information
resources and services in support
of the implementation and
monitoring of the Sustainable
Development Goals

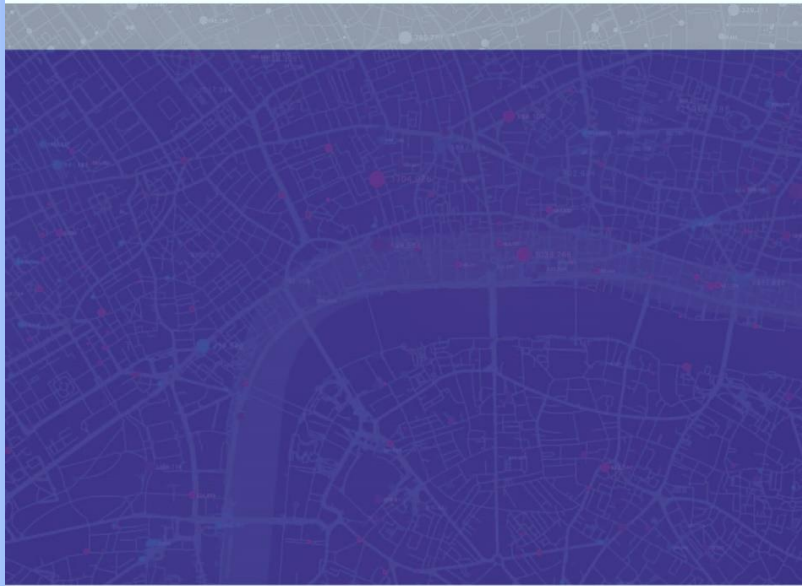


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Geospatial Data Taxonomy for SDGs in Africa...

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Geospatial Data Taxonomy for SDGs in Africa identified:

- The document identified all the SDG indicators which requires geospatial data and the corresponding geospatial data themes required
- Provides a geospatial data taxonomy for those geospatial information organized at a feature class level for each of the global fundamental geospatial data themes of UN-GGIM
 - **Geospatial feature classes** for each **Fundamental geospatial data themes** (14 Data Themes of UN-GGIM)
 - **Geospatial data model** for each **geospatial feature class**
 - Identified relevant geospatial information required for **SDG indicators (Matrix)**

Geospatial Data Taxonomy for SDGs in Africa...

Geospatial feature classes required for the indicators of Sustainable Development Goals

Data theme*	Feature Class – Level I	Feature Class – Level II	Key Attributes
A. Global Geodetic Reference Framework	Geodetic Control Network	Geodetic Control Station	Ref. No., Type, Description
B. Addresses	Address	-	Type, Value
C. Buildings and Settlements	Building	-	Type
	Settlement	-	Name, Class
D. Elevation and Depth	Elevation	Digital Elevation Model	Post spacing
	Depth	Digital Bathymetric Model	Post spacing
E. Functional Areas	Administrative Area	Country	Name, Status
		Second-level Administrative Area	Name
		Third-level Administrative Area	Name
		Government Functional Administration	Class, Name
		Exclusive Economic Zone (marine)	Name
		Conservation Area	-
	Statistical Area	-	Class, Name

Data theme*	Feature Class – Level I	Feature Class – Level II	Key Attributes
F. Geographical Names	Geographical Name	-	Class, Name
G. Geology and Soils	Geology	Aquifer	Type, Volume
	Soil Unit	-	Class
H. Land Cover and Land Use	Land Cover Unit	-	Class
	Land Use Unit	-	Class
I. Land Parcels	Cadastral Land Parcel	-	Parcel ID, Land tenure type
J. Orthoimagery	Orthoimage	-	Sensor platform, Spatial resolution, Spectral bands, Radiometric resolution, Image date
K. Physical Infrastructure	Structure	Bridge	Type, Span, Bearing weight
		Tunnel	Name
		Aqueduct	
		Canal	
		Dam	Type
	Public Utility	Telecommunications Tower	Type
		Electrical Power Generation	Type
		Waste Disposal Site	
		Sewerage Treatment	
		Water Reticulation Point	
	Public Service	School	Type, Name
		Health Facility	Type, Name, Health services

Geospatial Data Taxonomy for SDGs in Africa...

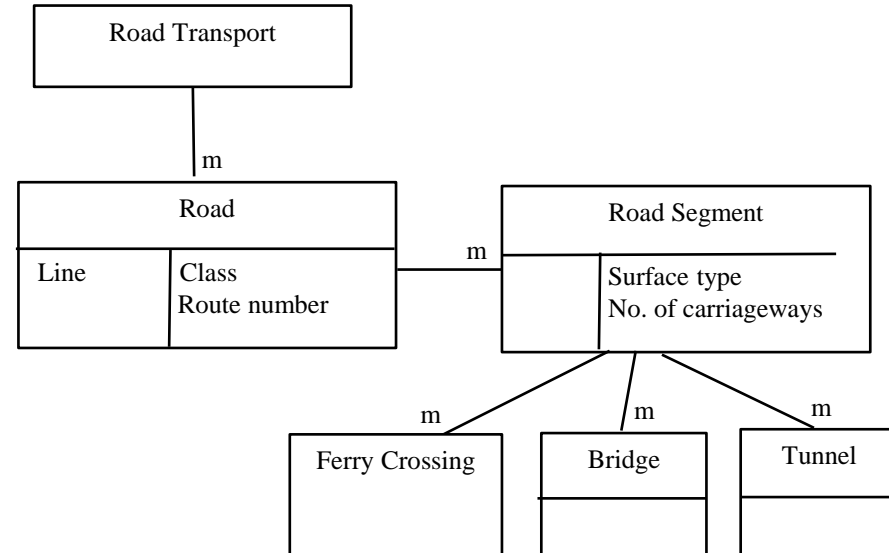
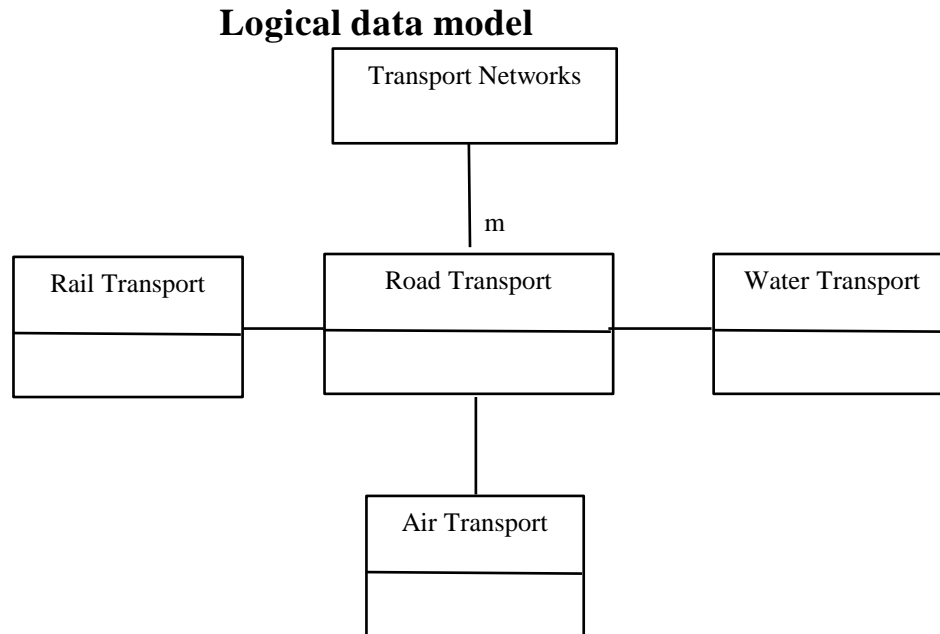
Data theme*	Feature Class – Level I	Feature Class – Level II	Key Attributes
L. Population Distribution	Population	-	
	Population Density	-	
M. Transport Networks	Road Network	Road	Class, route number/name, Surface type
		Street	Surface type, Name
	Rail Network	Railway	Class, Gauge
		Station	Name
	Water	Harbour	Class, Name, Capacity
		Ferry Crossing	Transport type
	Air	Airport or Aerodrome	Class, Name, Facilities
	Public Transport Route	-	
N. Water	Inland Water	River	Class, Name
		River Basin	Name
		Lake	Class, Name
		Wetland	Type
		Reservoir	Class
	Marine	Ocean or Sea	Name
		Coastline	

Geospatial Data Taxonomy for SDGs in Africa...

M. Fundamental geospatial data theme: Transport Networks

M.1 Feature class: Road Transport

M.1.1 Feature class: Road



Class – classification of the road.

Value: National freeway

National road

Provincial road

Urban freeway

District road

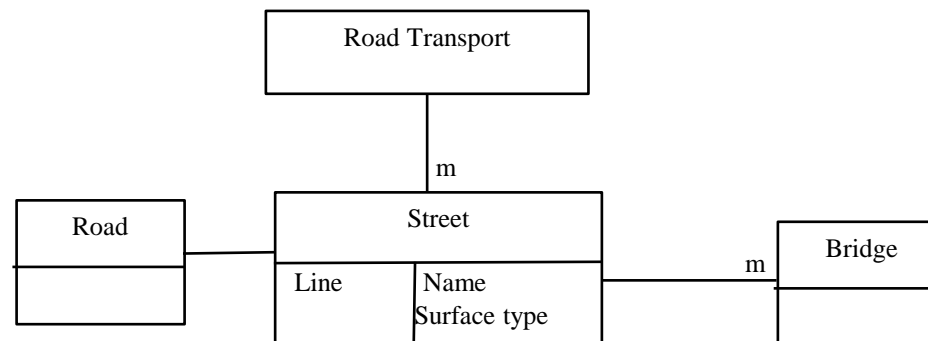
Main road

Secondary road

Track

Minor access road

M.1.2 Feature class: Street



Name – the name of the street.

Surface type – material of the surface

Value: Tar (bitumen)

Concrete

Brick

Salt (compacted)

Cobblestone

Gravel (compacted)

Earth

Geospatial Data Taxonomy for SDGs in Africa...

M.1.1 Feature class: Road

Collection and maintenance of features

- (i) Source
- (ii) Spatial Resolution
- (iii) Temporal aspects

Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

3.6.1; 9.1.1; 11.2.1; 11.5.2.

Geospatial Data Taxonomy for SDGs in Africa...

[illegible]

Geospatial Data Taxonomy for SDGs in Africa...

Indicators	Geographic Context & Infrastructure																																Environmental & Resource Management										Socio-Economic & Governance																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Geodetic Control Station	Address (dwelling)	Building (dwelling)	Settlement	Population Distribution (statistical unit)	Cadastral Land Parcel	Country	Second-level Administrative Area	Third-level Administrative Area	Administrative Area Exclusive Economic Zone	Government Functional Administration	Conservation Area	Statistical Area	Geographical Name	Aquifer	Soil Unit	Land Cover Unit	Land Use Unit	Orthoimage	Bridge	Tunnel	Aqueduct	Canal	Dam	Reservoir	Electrical Power Generation	Waste Disposal Site	Sewerage Treatment	Water Reticulation Point	Road (centreline)	Street	Station	Railway	Harbour	Ferry Crossing	Airport/Aerodrome	River (centreline)	River Basin	Lake	Wetland	Ocean/Sea	Coastline	Digital Elevation Model	Digital Bathymetric Model	Model Building (storage facility)	School	Buiding (commercial bank)	Building (automated teller machine)	Health Facility	Telecommunications Tower (mobile signal coverage)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
SDG 1: No Poverty	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓				✓	✓																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

Availability of Geospatial Datasets for SDGs in Africa

- Currently, ECA is conducting an assessment on availability of geospatial datasets in African countries for tracking the SDGs
 - Questionnaire is distributed to Member States
 - Responses are low
 - Preliminary result is being analyzed
- The result of the assessment will inform the status of countries in availability and utilization of geospatial datasets in monitoring the SDGs

Availability of Geospatial Datasets for SDGs in Africa...

• Example: South Africa

Data Theme	Geospatial Dataset	Coverage
Geodetic Network		100%
Address		90%
Building		100%
Settlements		100%
Digital Elevation Model		60%
Administrative Area	Second level administrative area	100%
	Third level administrative area	100%
	Government Administrative functional area	100%
	Conservation area	100%
	Geographical Names	95%
Aquifer		100%
Soil Unit		100%
Land Cover Unit	Land Cover Unit – Degraded	100%
	Land Cover Unit – Forest	100%
	Land Cover Unit – Agriculture	55%
	Land Cover Unit – Public Open Space	75%
Cadastral Land Parcel		100%
Orthoimage		100%

Data Theme	Geospatial Dataset	Coverage
Infrastructure	School	100%
	Health Facility	100%
	Road (rural – all-weather)	90%
	Street	100%
	Railway (public transport)	100%
	Station (public transport)	100%
	Harbour (public transport, fishing)	100%
	Airport-Aerodrome (public transport)	100%
	Public Transport Rout	100%
Telecommunications Tower (mobile/cellular communication)		100%
Waste Disposal Site	recycling	100%
	hazardous waste	100%
Sewerage Treatment		100%
Water Reticulation Point		100%

Data Theme	Geospatial Dataset	Coverage
Water	River	100%
	River Basin	100%
	Lake	100%
	Wetland	100%
	Reservoir	100%
	Ocean-Sea	100%
	Coastline	100%

Availability of Geospatial Datasets for SDGs in Africa...

• Example: Côte d'Ivoire

Data Theme	Geospatial Dataset	Coverage
Geodetic Network		100%
Address		0%
Building		5%
Settlements		100%
Digital Elevation Model		100%
Administrative Area	Second level administrative area	100%
	Third level administrative area	100%
	Government Administrative functional area	100%
	Conservation area (Forest)	20%
	Geographical Names	90%
Aquifer		-
Soil Unit		100%
Land Cover Unit	Land Cover Unit – Degraded	8%
	Land Cover Unit – Forest	10%
	Land Cover Unit – Agriculture	48%
	Land Cover Unit – Public Open Space	-
Cadastral Land Parcel		-
Orthoimage		100%

Data Theme	Geospatial Dataset	Coverage
Infrastructure	Bridge	-
	Dam	-
	Electrical Power Generation	100%
Infrastructure	School	70%
	Health Facility	90%
	Road (rural – all-weather)	50%
	Street	50%
	Railway (public transport)	100%
	Station (public transport)	80%
	Harbour (public transport, fishing)	100%
	Airport-Aerodrome (public transport)	100%
	Public Transport Route	75%
Telecommunications Tower (mobile/cellular communication)		-
Waste Disposal Site	recycling	-

Data Theme	Geospatial Dataset	Coverage
Water	River	100%
	River Basin	75%
	Lake	50%
	Wetland	25%
	Reservoir	-
	Ocean-Sea	100%
	Coastline	100%

Conclusion

- There are efforts made at national, regional and global levels to make geospatial data available to monitor and achieve the Sustainable Development Goals of the 2030 Agenda for Sustainable Development
- There is still a need to strengthen the capacities of ECA member States in the production, management and use of geospatial information
- ECA will continue supporting countries on capacity development to strengthen individual and institutional capacities
- Continue assisting countries to develop their NSDI, integrating with IGIF, implementing national action plans for IGIF, building fundamental datasets to improve the availability of geospatial information for effective monitoring and implementation of the SDGs



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Thank you!

Ideas
to
Action