

# The Global Fundamental Geospatial Data Themes Journey



**UN-GGIM**

UNITED NATIONS  
COMMITTEE OF EXPERTS ON  
GLOBAL GEOSPATIAL  
INFORMATION MANAGEMENT

*Ninth Session of UN-GGIM  
August 2019*





## The route we took ...



# Context for the Global Fundamental Geospatial Data Themes

Work embarked at GGIM5, following a report on fundamental data themes prepared by UN-GGIM:Europe

The Committee agreed that there is:

*'an urgent need for a set of **global fundamental geospatial data themes** that could be harmonized in order to enable the measurement, monitoring and management of sustainable development in a consistent way over time and to facilitate evidence-based decision-making and policy-making'*



# UN-GGIM: Europe asked to take lead to:



- Produce a recommendation for a minimum list of **global fundamental geospatial data themes**. Each data theme should be supported by a description and guidelines.
- Take account of **existing activity** being undertaken by UN-GGIM regional committees, ensuring that where possible **existing resources** are used.
- Consider the prioritisation of the data themes and how they **link to other data needs** within the UN-GGIM programme of work.
- Consider the specific needs and vulnerabilities of small island developing States.
- Ensure that the data themes should be technical in nature so as not to raise political concerns.



# What was done and how

Regions



Workshops



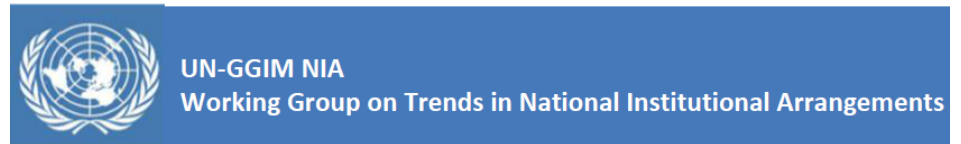
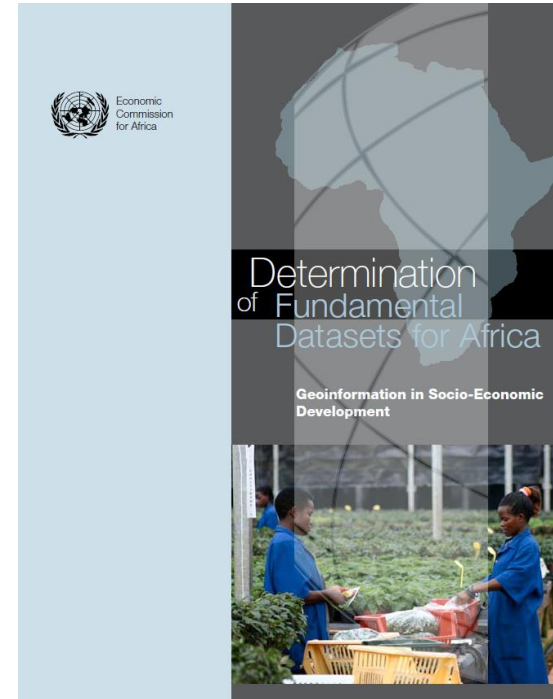
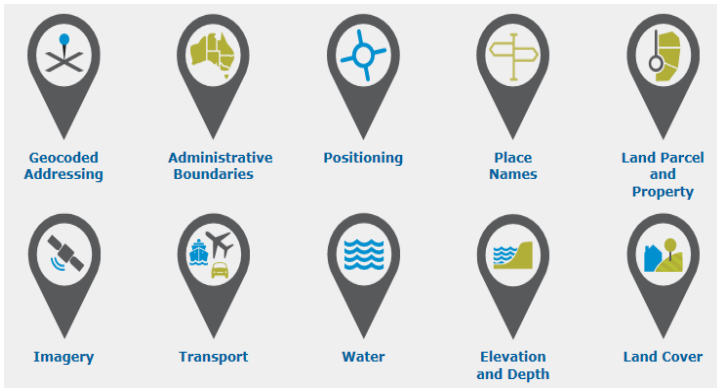
WG Members



# It was not difficult to find existing work ...



Fundamental Geospatial Data



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# 'Common Denominator' approach

UN-GGIM: Europe	GGIM: Africa (UNECA and GSDR)	GGIM: AP (ANZLIC)	UN-GGIM: Arab States	UN GGIM: Americas (PAIGH)	WG - NIA
Geographical names	Geographic names	Place names	Names	Geographic names	Geographical names
Administrative units	Boundaries	Administrative boundaries	Administrative Boundaries	Administrative Units	Administrative units
Transport networks	Transportation	Transport	Transport Networks	Communications networks	Transport networks
Hydrography	Hydrography Drainage	Water	Hydrography	Hydrography	Hydrography
Orthoimagery	Imagery	Imagery	Imagery	Images	Imagery
Elevation	Hypsography	Elevation and depth	Elevation	Relief	Elevation
Land cover	Natural environment	Land cover	Land cover	Land cover	Land Cover
Cadastral parcels	Tenure/parcels (part of land management theme)	Land parcel and property	Land parcels	Cadastral records	Cadastral parcels
Addresses	Street addresses (part of land management theme)	Geocoded addressing	Addresses	Addresses	
Buildings	Populated places (part of Boundaries theme)			Population	Settlements
Utilities and government services	Utilities and services		Utilities		
Area Management	Land management units/areas				
Statistical Units					
Land Use					



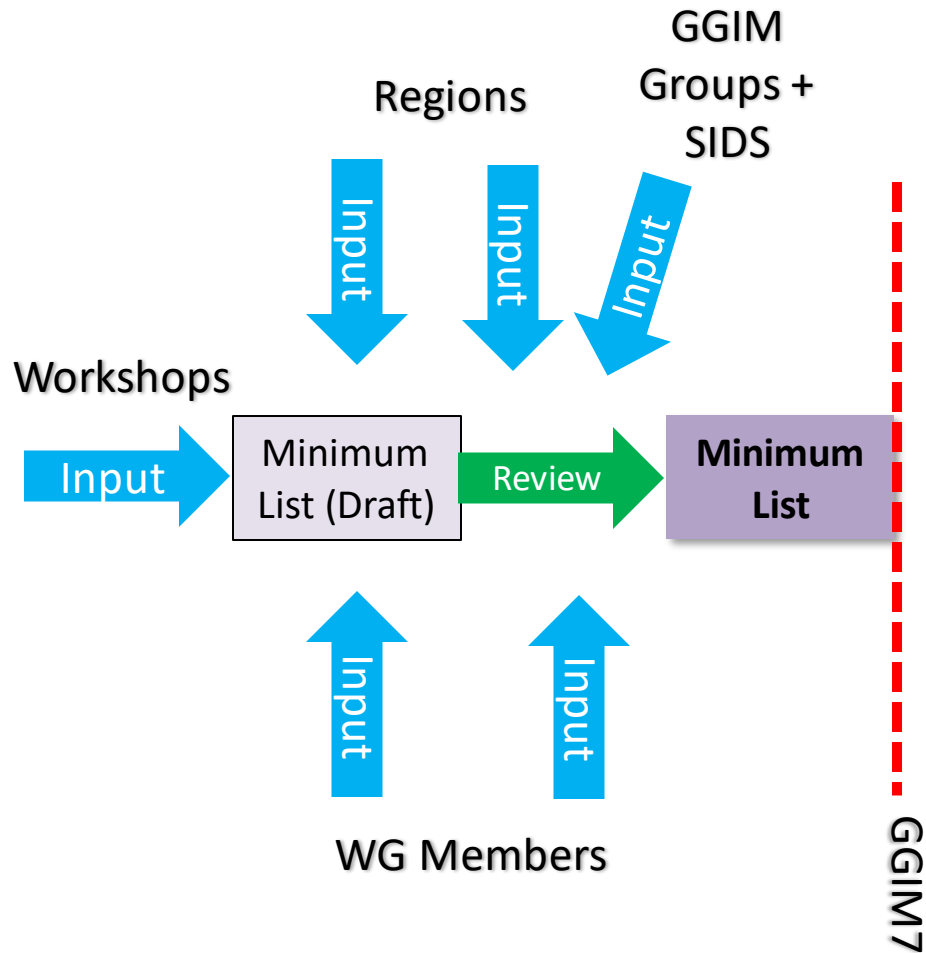
# SDG Requirements approach

INSPIRE Theme	Sustainable Development Goal												
	1	2	3	5	6	7	8	9	11	12	13	14	15
Address													
Administrative units													
Cadastral parcels													
Geographical Names													
Hydrography													
Transport networks (road, rail, water, air, cable)													
Protected sites													
Elevation													
Land cover													
Ortho-Imagery													
Geology													
Buildings													
Land use (existing, planned)													
Soils													
Human health													
Governmental services and utilities													
Environmental Monitoring facilities													
Production facilities													
Agricultural facilities													
Population distribution/Statistical Units													
Area management - Regulated areas													
Natural risk zones													
Sea regions													
Oceanographic features													
Atmospheric conditions – meteorologic features													
Biogeographical regions													
Habitats and biotope													
Species distribution													
Energy resources													
Mineral resources													





# What was done and how

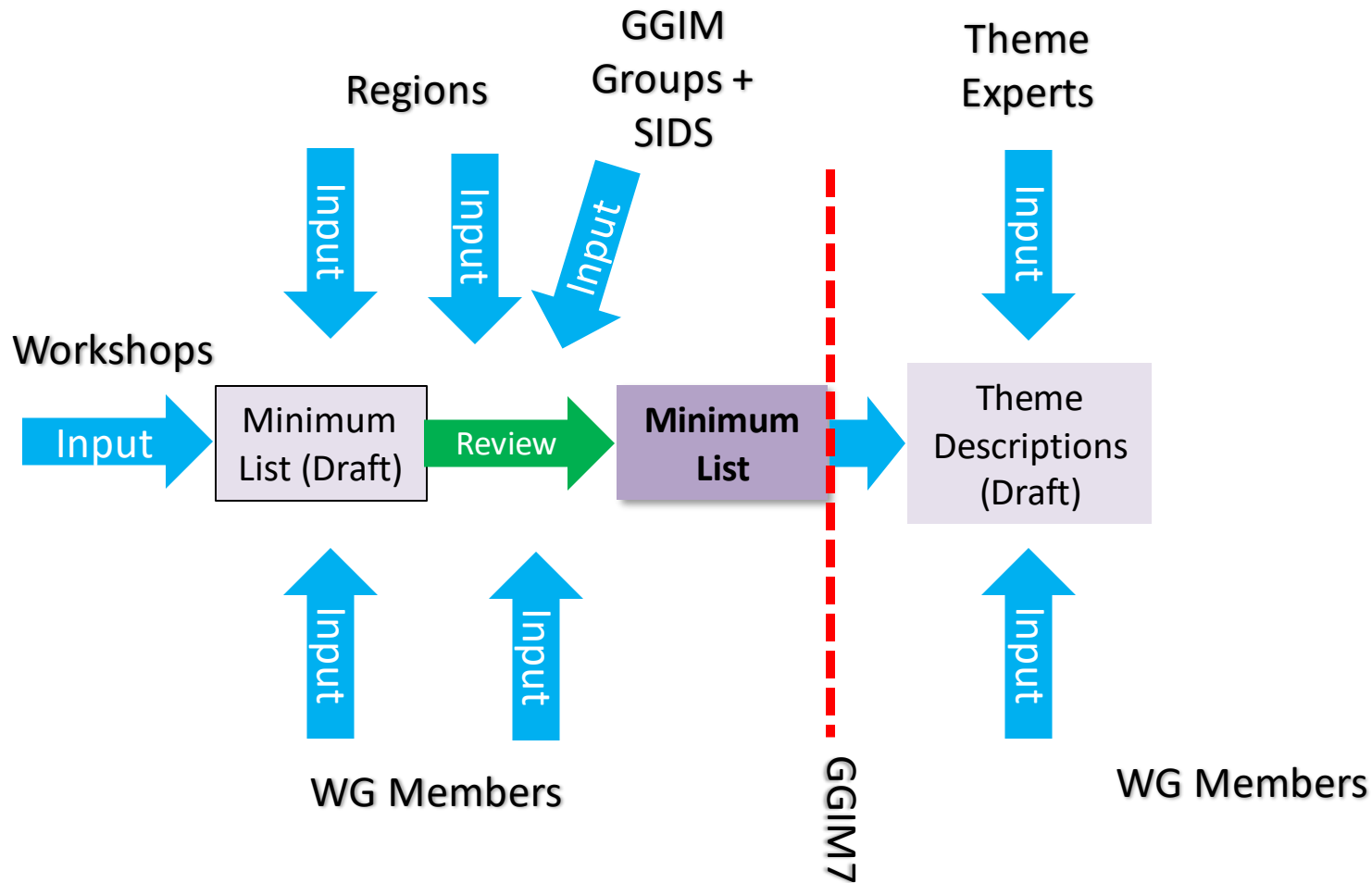


# Data Themes and Reference Frame

1. Global Geodetic Reference Framework
2. Addresses
3. Buildings and Settlements
4. Elevation and Depth
5. Functional Areas
6. Geographical Names
7. Geology and Soils
8. Land Cover and Land Use
9. Land Parcels
10. Orthoimagery
11. Physical infrastructure
12. Population Distribution
13. Transport Network
14. Water



# What was done and how



# Theme Description – One side A4 only

<b>Theme title</b>
<b>Description</b>
<b>Why this theme fundamental?</b>
<b>Which sustainable development goals (SDGs) will it help to meet?</b>
<b>Geospatial data features in more detail</b>
<b>Possible sources of geospatial data</b>
<b>Existing geospatial data standards</b>



# Example - Addresses

**Theme title:**

**Addresses**

**Description**

An address is a structured label, usually containing a property number, a street name and a locality name. It's used to identify a plot of land, a building or part of a building, or some other construction, together with coordinates indicating their geographic position. Addresses are often used as a proxy for other data themes such as Land Parcels.

**Why is this theme fundamental?**

Addresses underpin government administration at all levels; and good administration is a prerequisite for achieving sustainable development goals. An address is often the unit to which a public service, such as water, is provided. Addresses also enable effective communication with citizens; informing them of policies applying to them, and notifying them of relevant incidents. The theme also helps in managing buildings and properties, and supports social surveys. Datasets relating to individuals or households are often linked to addresses, which can therefore play a role in connecting otherwise-unrelated information. Geocoding addresses relates such information to geographic location. This allows for location-based data analytics and data mining.

**Which sustainable development goals (SDGs) will it help to meet?**

Addresses have been identified as playing a key role in the achievement of SDGs 4,6,7,9 and 11.

**Geospatial data features in more detail**

The addresses theme comprises a single feature type, address, to which a variable number of attributes may be attached. Typically, in urban areas these comprise at least one locator (building, floor or apartment number and/or name), a two-dimensional geographic position and a number of address components which place the address within other features such as a road, a locality, an administrative unit or postal code. In rural areas the locator may be less precise.

**Possible sources of geospatial data**

Address datasets are usually maintained by public authorities. While data may be created and maintained at a local level, it should ideally be compiled into a single national register.

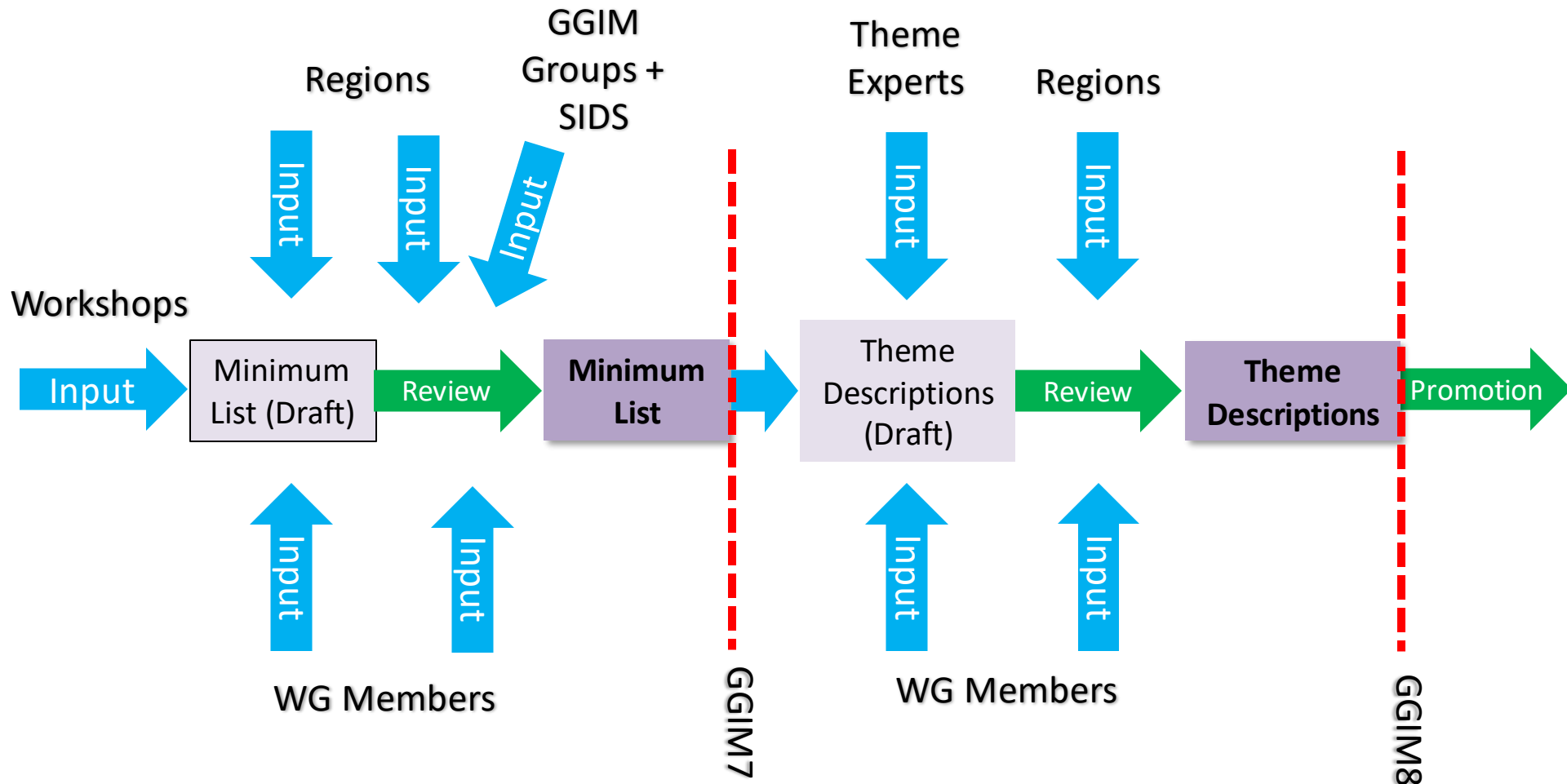
**Existing geospatial data standards**

Note: This is indicative. Other lists of standards exist and UN-GGIM will seek to work with thematic experts to develop a list of relevant data standards.

- INSPIRE Data Specification on Addresses – Technical Guidelines 3.1
- ISO 19160-1:2015 Addressing -- Part 1: Conceptual model
- ISA Programme Location Core Vocabulary
- ISO 19160-4 (UPU, Universal Postal Union) Addressing --Part 4: International postal address components and template language



# What was done and how



# What next after adoption?

- Promotion and awareness raising of the Global Fundamental Geospatial Data Themes



# Icons



Global Geodetic Reference Frame



Geographical Names



Addresses



Functional Areas



Buildings and Settlements



Land Parcels



Transport Networks



Elevation and Depth



Population Distribution



Land Cover and Land Use



Geology and Soils



Physical Infrastructure



Water



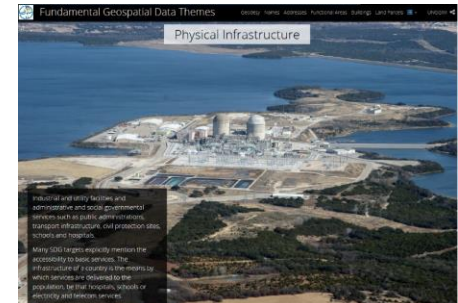
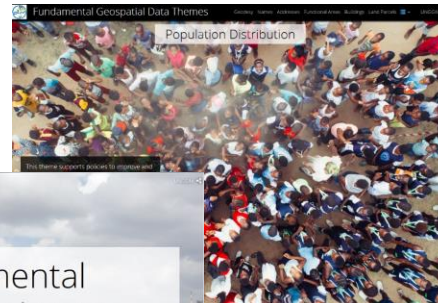
Orthoimagery



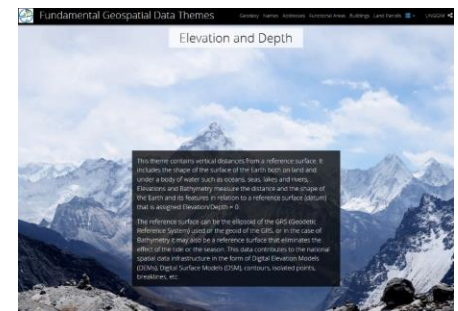
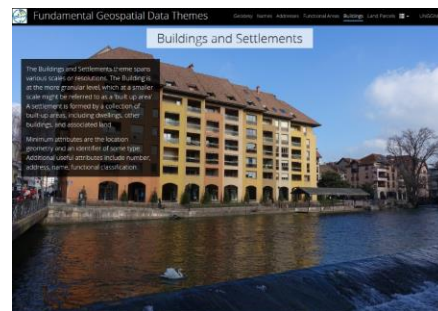
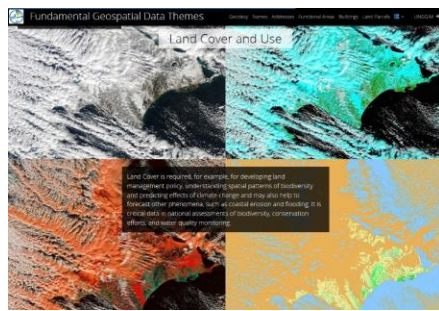
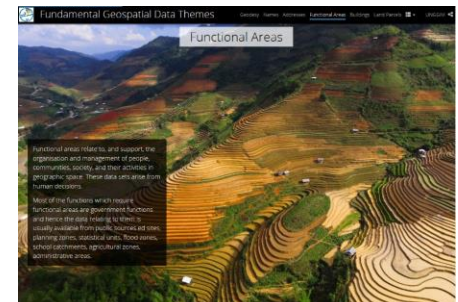
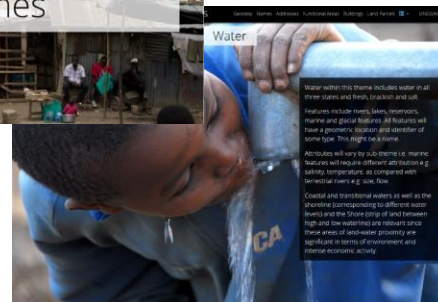


# Data Themes Storyboard

Created by the GGIM Secretariat:



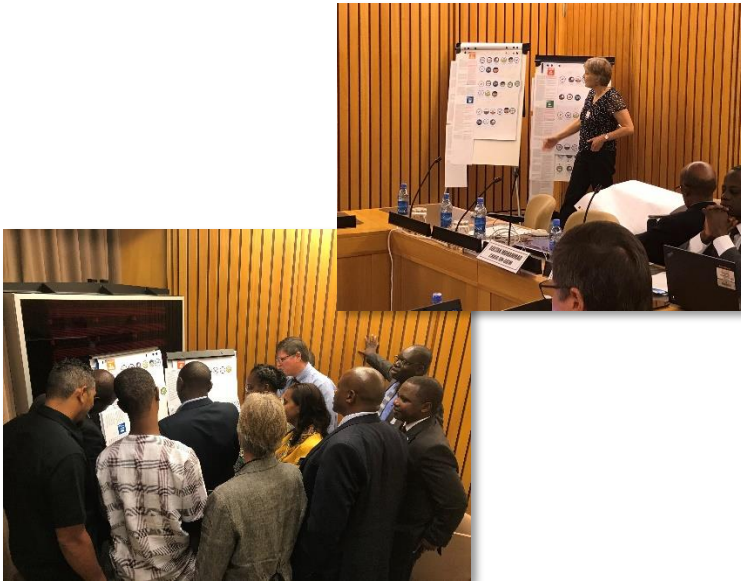
Fundamental Geospatial Data Themes



## Story Map Cascade



# Regional and national implementation Workshops on Fundamental Data



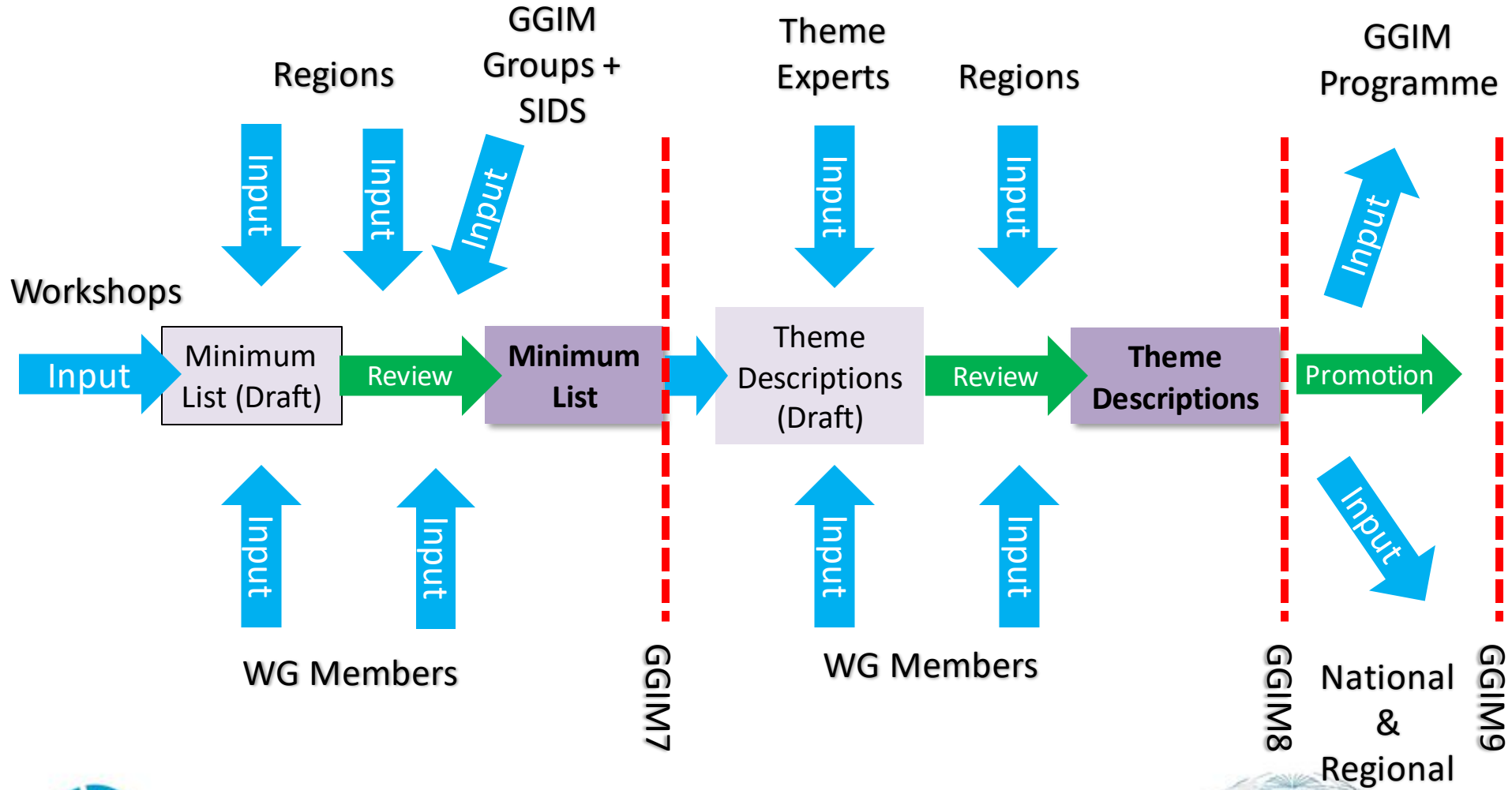
Dedicated three-day workshop  
organised at UNECA Addis Ababa  
in April 2018



Small workshop organised as part of the  
UN-GGIM: Europe Plenary, May 2018



# What was done and how



## More than promotion ...

- Promotion and awareness raising
- Inclusion in broader UN-GGIM programme
- Regional and national implementation



# UN-GGIM Publication

The Global Fundamental Geospatial Data Themes



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## Geographical Names



Geographical names provide orientation and identity to places. They are location identifiers for cultural and physical features of the real world, such as regions, settlements, or any feature of public or historical interest. They are often used as a proxy for other data themes such as Settlements.



### Why is this theme fundamental?

Geographical names are used throughout the world as a geographic identification system and thus have potential to inter-relate and cross-reference disparate data sources, both spatial and non-spatial. Standardised geographical names are essential for effective communication between citizens, governments of all levels, decision-makers, and policy-makers.

Geographical names are often used for geocoding and mapping. The geocoding use case consists of transforming an indirect location identifier (here a geographical name) into a direct location identifier defined by a set of coordinates. Geographical names are the most common, understandable, and widely used entry-point for broader searches for geospatial data and information and are therefore, necessary as search criteria in gazetteers, geoportals, spatial data catalogues etc. Geographical names are also required for a wide range of topographical and thematic map output at any scale. They are necessary for a consistent communication and visualisation of any SDG related issue or action.

### Which sustainable development goals (SDGs) will it help to meet?

The wide use of geographical names makes them relevant for all SDGs.

### Geospatial data features in more detail

The Geographical Names theme may comprise attributes of feature types that are already in another fundamental geospatial data theme, such as Transport Networks or Water, and/or as feature types that are not yet in another theme. A named place (e.g. settlement, mountain, bay) may have several names in different languages.

Many named features have indeterminate boundaries but, where feasible, their delineation should be included.

### Possible sources of geospatial data

National geographical names datasets are usually maintained by public authorities for features on land, coastal or marine areas. Additionally, many datasets are published by (semi-official) bodies with a particular goal (e.g. for certain region, languages, topics...).

### Existing geospatial data standards

Note: This is indicative. Other lists of standards exist and UN-GGIM will seek to work with thematic experts to develop a list of relevant data standards.

- Technical reference manual for the standardization of geographical names, (UNGEGN), 2007, ISBN: 92-1-161500-5;
- INSPIRE Data Specification on Geographical Names – Technical Guidelines 3.1;
- ISO 639 Language Code List for the language of origin of geographical names; and,
- UTF-8 character set (UNICODE) for the exchange of syllabics, diacritics and other special characters.

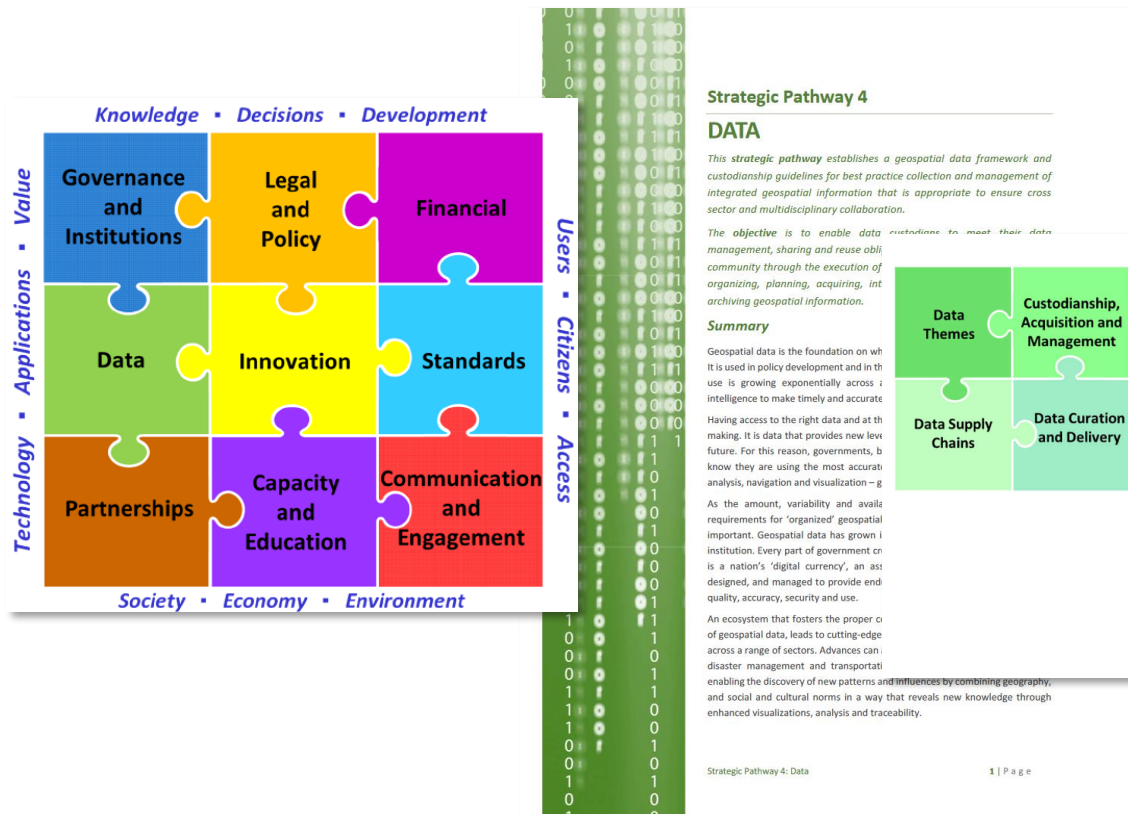
[http://ggim.un.org/meetings/GGIM-committee/9th-Session/documents/Fundamental\\_Data\\_Publication.pdf](http://ggim.un.org/meetings/GGIM-committee/9th-Session/documents/Fundamental_Data_Publication.pdf)



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# INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK

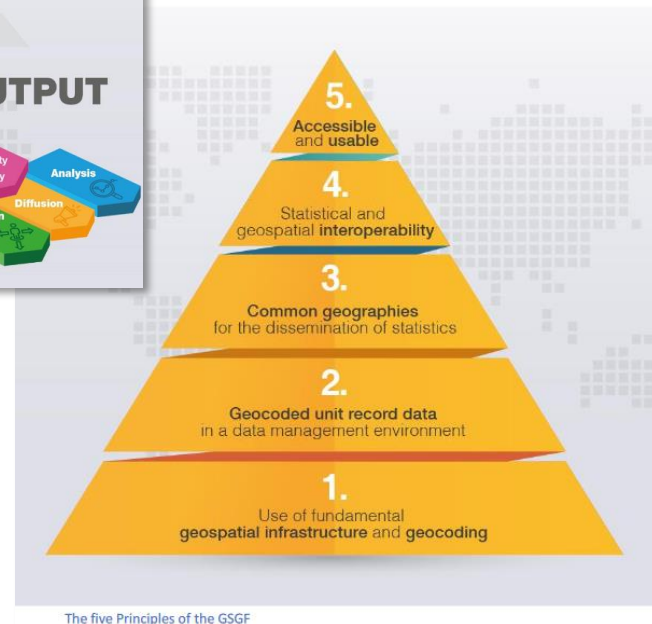
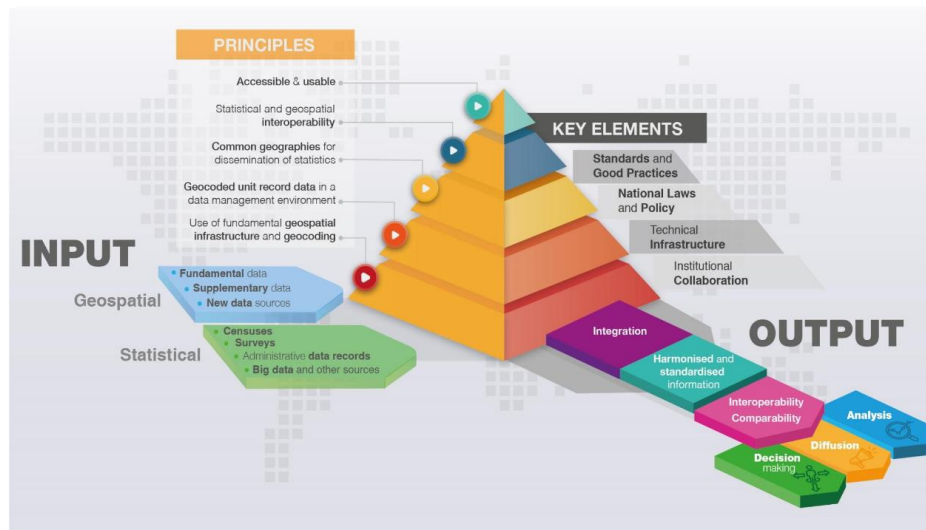


Common to all government and business applications are four key elements associated with data coordination that need to be achieved to enable an environment where innovation, and pioneering research and development can thrive. These four elements are:

- **Data Themes** – the organization of priority national data themes, aligned to the globally endorsed fundamental geospatial data themes.
- **Custodianship, Acquisition and Management** – leading to responsible collection, management, maintenance and dissemination of fit-for-purpose geospatial information.
- **Data Supply Chains** – and interlinkages that support cooperative data sharing and integration.
- **Data Curation and Delivery** – enables enduring accessibility and value of data, and an information resource for broader usage across all sectors.



# The Global Statistical Geospatial Framework



# Terms of Reference

- ✓ • Produce a recommendation for a minimum list of **global fundamental geospatial data themes**. Each data theme should be supported by a description and guidelines.
- ✓ • Take account of **existing activity** being undertaken by UN-GGIM regional committees, ensuring that where possible **existing resources** are used.
- ✓ • Consider the prioritisation of the data themes and how they **link to other data needs** within the UN-GGIM programme of work.
- ✓ • Consider the specific needs and vulnerabilities of small island developing States.
- ✓ • Ensure that the data themes should be technical in nature so as not to raise political concerns.





# Thank you!



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