



# Use of geospatial data and earth observations with climate change statistics

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# “Everything happens somewhere...”

Nancy Tosta, June 2001



Everything that happens...happens somewhere.

We can locate, view, relate, record, collect, measure, analyze, model and monitor what happens where, when, why, and how.

We can do this more today than ever before....which is far less than what we will do tomorrow.



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# “What IS ‘geospatial information’ today?”



**Geospatial information represents much more than the ‘digital map’ of a nation; it is the ‘digital currency’ for evidence-based decision-making. Geospatial information is a critical component of the national infrastructure; both a blueprint of what happens where, and the means to integrate a wide variety of data across multiple sectors.**

What is geospatial information? Geography? How mainstream is it?  
How do we use it, best leverage it, communicate it?  
What does it mean? What is its identity? What is next?  
Is it an industry in its own right? Or is it a data and technology enabler for many, or all, industries?

Geospatial information is not just data, software, hardware, applications, solutions...it is the instrument of geography; the ‘geography’ of data, software, applications, solutions...

Geospatial information is the integrative glue for everything else. Without it other things are often meaningless and/or without context.

The role of geospatial information is changing and evolving rapidly...



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What is changing rapidly is the pace at which high fidelity data is being made available... combined with enabling technologies and sophisticated analytics... that are able to collect and manipulate the data. How do we keep up?

Change itself is not the problem...that is inevitable progress. It is the pace of change that is so challenging for us. How are we responding to this pace... and the many multidimensional aspects?

“Increases in the amount and variability of data, combined with massive advances in communications and digital technology, digital transformation, have seen the emergence of geospatial information as a major contributor to economic transformation in many countries, including e-government, e-service and e-commerce.”

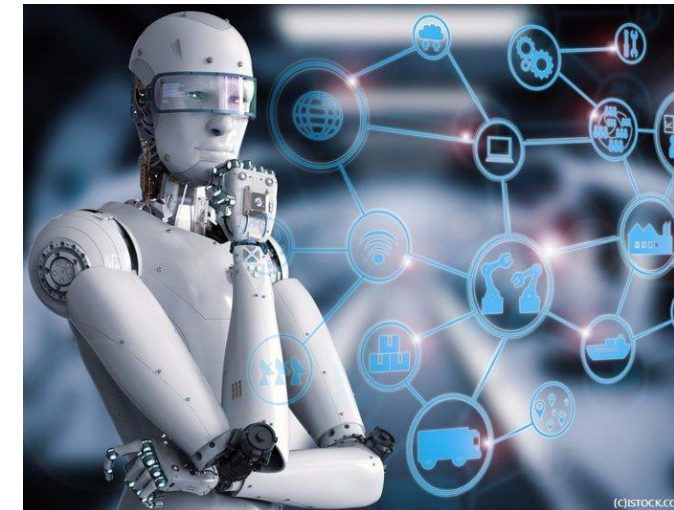
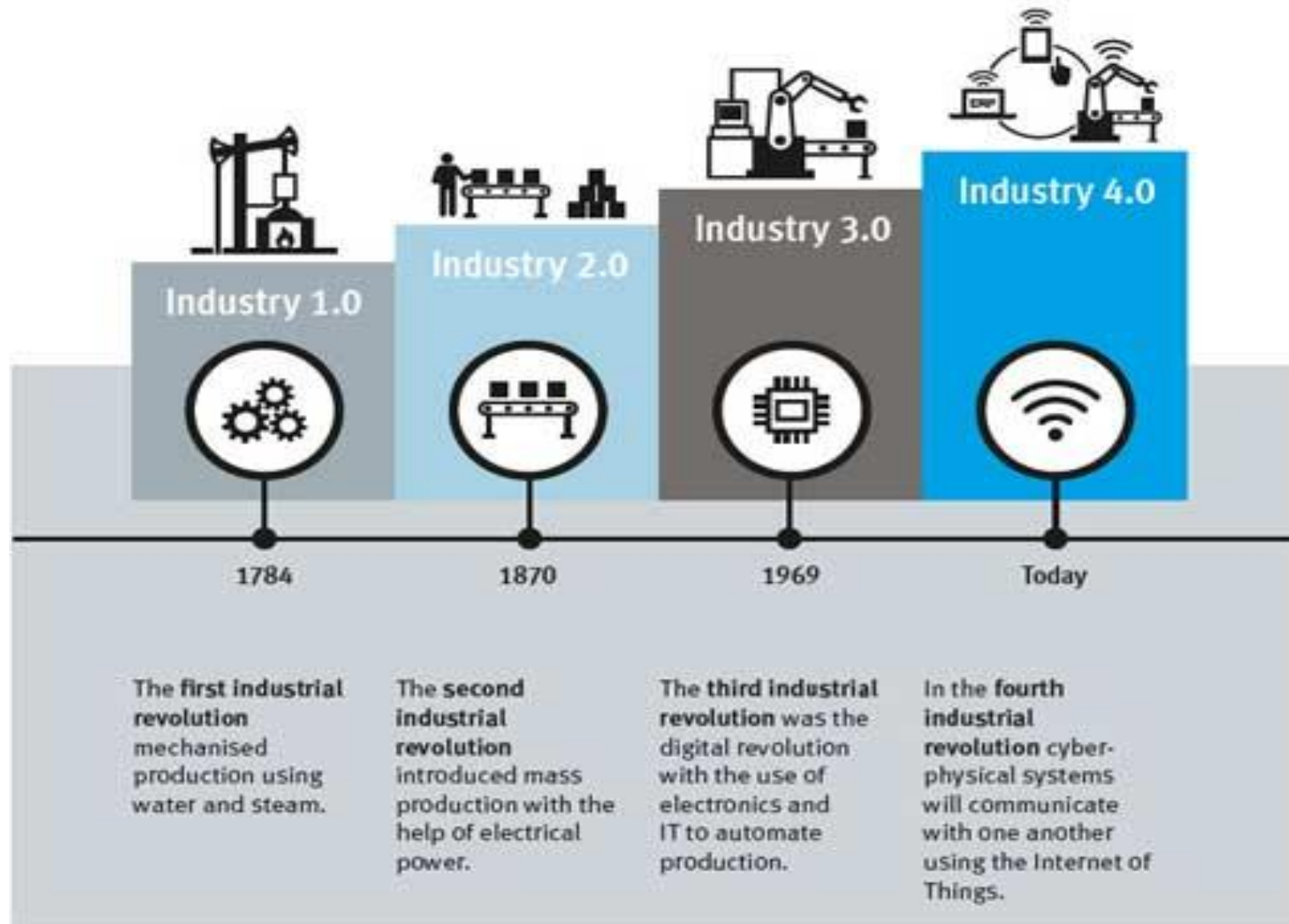


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The disruptive nature of digital transformation, technology, innovation, and their exponential impacts, means that society's expectations on how, and at what level of detail, we record what is happening where and when are changing at a rapid pace.



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# 2030 Agenda: Goals, targets, indicators, measuring...



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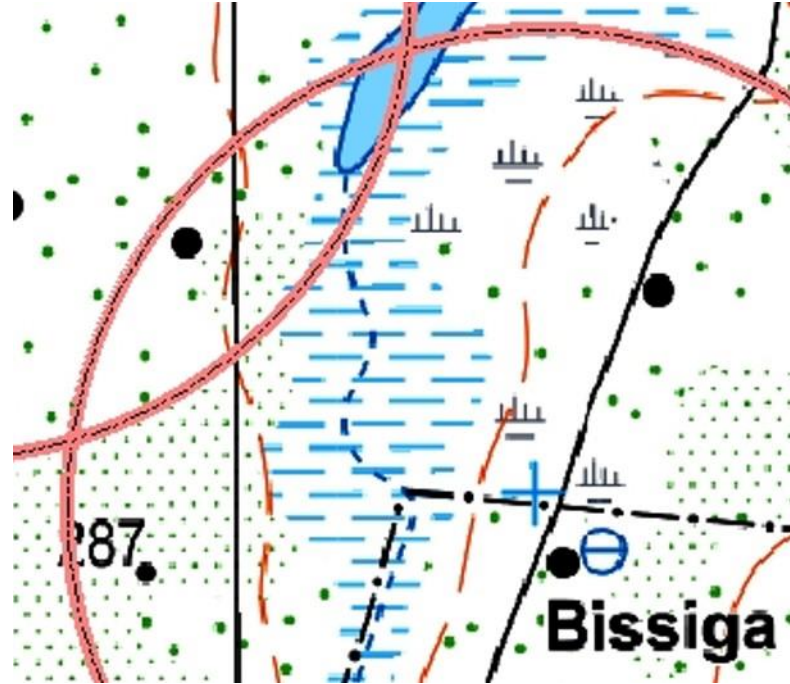
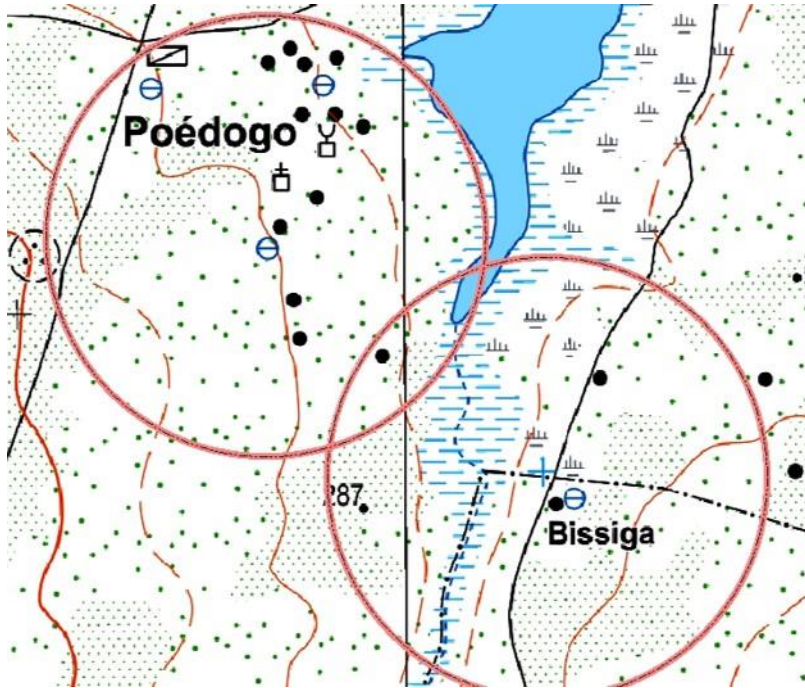
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# Climate-change Statistics and Geography



Example of Bissiga, Burkina Faso

Understanding and using the geographic dimension is crucial to understanding the impact of climate change. There are numerous data needs. From using existing, traditional data sources, such as population or environmental statistical data, to innovative approaches from big data and/or complementary datasets such as Earth Observation or Crowdsourced datasets, there are many opportunities for NSOs to support informed data driven decisions.



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Fostering partnerships and developing policies, frameworks, and methodologies



# EXPERT AND WORKING GROUPS



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# Inter-Agency and Expert Group on the Sustainable Development Goal Indicators: Working Group on Geospatial Information



- Established in 2016
- 2 Current Work Streams:

1. Disaggregation and Aggregation by Geographic Location
2. Transforming Earth Observations into Geospatial Information

1. Provide expertise and advice to the IAEG-SDGs and the larger statistical community as to how geospatial information, Earth observations and other new data sources can reliably and consistently contribute to the indicators;
2. Review options and provide guidance to IAEG-SDGs, as to the role of NSOs in considering geospatial information and earth observations, as well as other Big Data, as a means to contribute to and validate datasets as part of official statistics for SDG indicators;
3. Review the agreed indicators and metadata through a 'geographic location' lens and identify existing geospatial data gaps, methodological and measurements issues;
4. Consider how geospatial information can contribute to the indicators and metadata:
  - a. as a direct indicator in itself;
  - b. to support and augment statistical data;
  - c. to improve the production process of statistical data;
  - d. to validate national statistical data inputs;
  - e. to communicate and visualize the geographic dimensions and context of the indicators where appropriate; and,
  - f. to provide granularity and disaggregation of the indicators where appropriate;
5. Provide national and regional level experiences and best practices in geospatial data production to measure leaving no one behind; and,
6. Propose strategies for undertaking methodological work on specific areas for improving disaggregation by geographic location concepts for national and sub-national reporting, including to the HLG and to the Statistical Commission.



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# Inter-Agency and Expert Group on the Sustainable Development Goal Indicators: Working Group on Geospatial Information

- Identified a shortlist of SDG Indicators where **geospatial information** has a **direct/significant/supporting contribution**;
- Current work includes understanding how to build on, and extend, the Working Group's role in providing expertise and advice in relation to how geospatial information and Earth observations (EO) can reliably and consistently contribute to the **tracking, monitoring, and reporting** on the SDG indicators
- Identifying opportunities for NSOs to utilize existing, open, and/or free data assets - such as **Sentinel, Landsat** and **complementary data** can inform and support the 2030 Sustainable Development Agenda;





# United Nations Expert Group on the Integration of Statistical and Geospatial Information

- Established in 2013
- Developed the Global Statistical Geospatial Framework and developing/refining its Five Principles
- Reports to both UN Statistical Commission and the UN Committee of Experts on Global Geospatial Information Management
- Support 2020 Round of Census and the 2030 Sustainable Development Agenda
- Fostering collaboration between and within the Statistical and Geospatial communities

1. To provide a forum for coordination and dialogue among representatives of both statistical and geospatial communities with a view to developing a global statistical-geospatial framework as a standard for the integration of statistical and geospatial information;
2. To propose work plans and guidelines to advance the implementation of a global statistical-geospatial framework so that there is increased information to support social, economic and environmental policy decision making, including at the sub-national level;
3. To address various technical, institutional and information policy issues related to implementation of a global statistical-geospatial framework, especially issues related to confidentiality; and,
4. To pursue the implementation of the statistical-geospatial framework in the 2020 Round of Censuses with the understanding it would apply to other initiatives including other censuses, such as agriculture censuses, economic censuses, etc, and global initiatives such as the Post-2015 Development Agenda and Big Data.



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Integrating Statistical and Geospatial Information



# GLOBAL STATISTICAL GEOSPATIAL FRAMEWORK



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# Global Statistical Geospatial Framework: Background

- In August 2016, UN-GGIM, at its sixth session, adopted the **Five Principles** of the Global Statistical Geospatial Framework. This was endorsed by the UN Statistical Commission in March 2017 at its 48<sup>th</sup> session.
- The Global Statistical Geospatial Framework enables:
  - new, better and more integrated information for analysis and decision making processes;
  - comparisons within and between countries in a more harmonised manner;
  - increased information on smaller geographic areas;
  - The development of common tools/applications to support the integration and sharing of data;
  - commercial development of geospatial tools that will further support data integration; and, generally more efficient production of information.
- Developed based on Australia's Statistical Spatial Framework (SSF) which was sent out for global consultation and as a result of the consultation further refinements were made.



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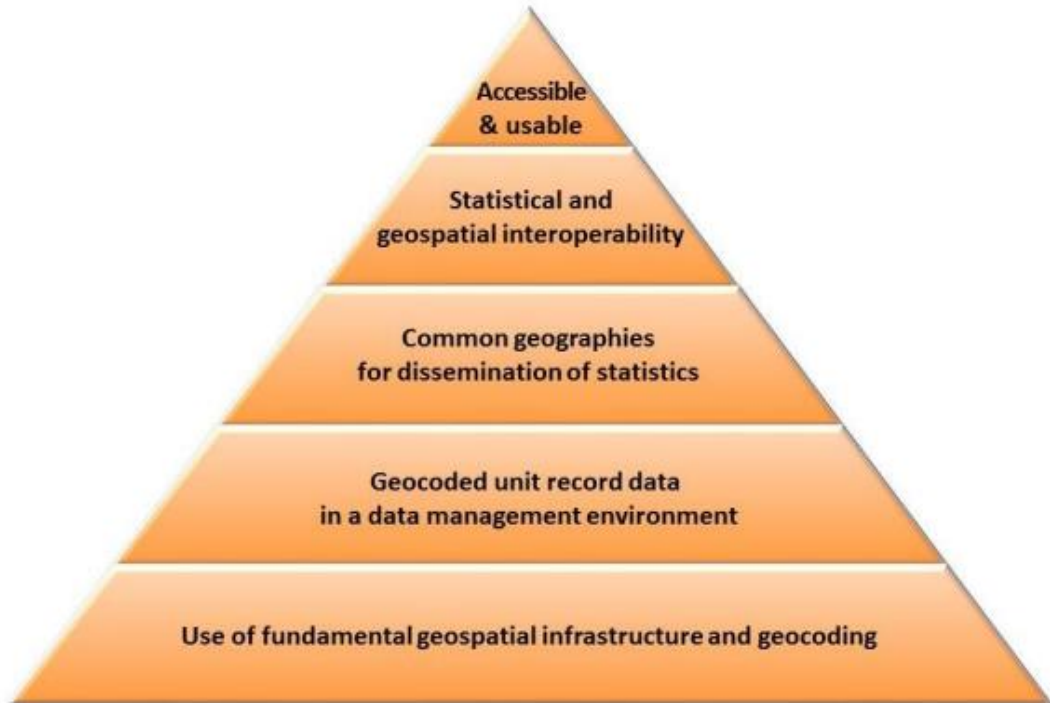
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Currently implemented by Mexico, New Zealand, Australia, Egypt, and others

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# Global Statistical Geospatial Framework: Five Principles



- Principle 1: Use of fundamental geospatial infrastructure and geocoding.
- Principle 2: Geocoded unit record data in a data management environment.
- Principle 3: Common geographies for dissemination of statistics.
- Principle 4: Statistical and geospatial interoperability - Data, Standards and Processes.
- Principle 5: Accessible and usable geospatially enabled statistics.







A strategic guide to develop and strengthen national geospatial information management



# INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK



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# Background

- In August 2017, UN-GGIM welcomed a new Collaborative Agreement between UNSD and the World Bank, this was endorsed at the Eighth Session of UN-GGIM in 2018.
- The basis of the collaboration was a recognition of the growing need to explore and develop mechanisms for **geospatial data, infrastructure and policies** to be embedded more holistically within concessional financing, technical assistance and knowledge sharing services; and implementation in developing countries.
- A key deliverable of the collaboration is an overarching **geospatial information management framework** that Member States can reference when implementing integrated evidence-based decision-making solutions, and that maximizes and leverages national systems tailored to their own situations.
- The result is an **Integrated Geospatial Information Framework. Part 1: Overarching Strategic Framework**, is to be adopted by UN-GGIM at this session.



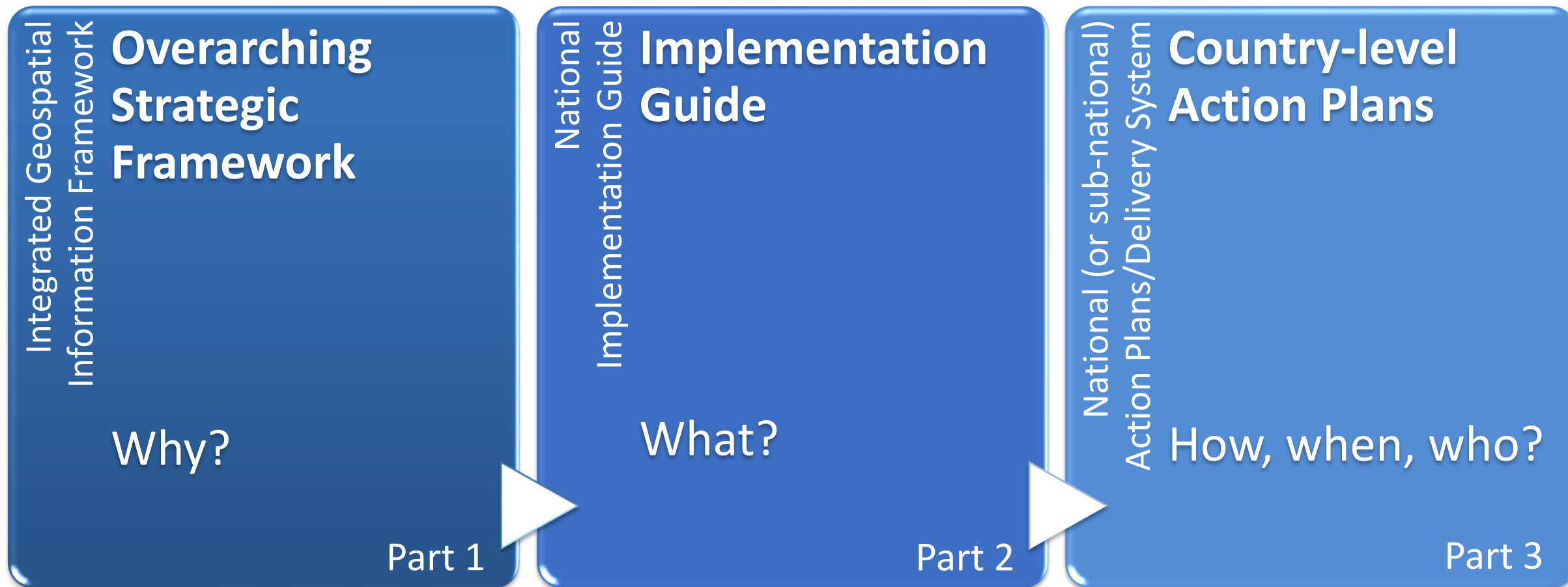
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The **Integrated Geospatial Information Framework** comprises a 3-part document set as separate, but connected, documents. The **Overarching Strategic Framework** is fully developed following a global consultation. The structure and main elements of the **Implementation Guide** are developed for in-principle approval. The **Country-level Action Plans** are work in progress.



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# Overarching Strategic Framework

- A forward-looking Framework built on national needs and circumstances.
- Provides the overarching strategic messages and more expansive and integrated national framework, particularly focusing on policy perspectives and elements of geospatial information.
- Sets the context of ‘why’ geospatial information management is a critical element of national social and economic development.
- **Vision and Mission** statements communicate the overarching aim of the Integrated Geospatial Information Framework.
- It does this via **7 Underpinning Principles, 8 Goals and 9 Strategic Pathways** that lead to a national approach that takes account of national circumstances, priorities and perspectives.
- The Overarching Strategic Framework is intended for a wide range of stakeholders - these primarily being high-level policy and decision makers, institutions and organizations within and across government.



The Framework is a mechanism for articulating and demonstrating national leadership, cultivating champions, and developing the capacity to take positive steps.



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# Overarching Strategic Framework: Vision and Mission

The **Vision** recognizes the responsibility for countries to plan for and provide better outcomes for future generations, and our collective aspiration to leave no one behind

The **Mission** is designed to stimulate action towards bridging the geospatial digital divide; to find sustainable solutions for social, economic and environmental development; and to influence inclusive and transformative societal change for all citizens according to national priorities and circumstances.

## Vision

The efficient use of geospatial information by all countries to effectively measure, monitor and achieve sustainable social, economic and environmental development - leaving no one behind.

## Mission

To promote and support innovation and provide the leadership, coordination and standards necessary to deliver integrated geospatial information that can be leveraged to find sustainable solutions for social economic and environmental development.



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# Overarching Strategic Framework: Principles

## Underpinning Principles:

**PRINCIPLE 1: Strategic Enablement**

**PRINCIPLE 2: Transparent and Accountable**

**PRINCIPLE 3: Reliable, Accessible and Easily Used**

**PRINCIPLE 4: Collaboration and Cooperation**

**PRINCIPLE 5: Integrative Solution**

**PRINCIPLE 6: Sustainable and Valued**

**PRINCIPLE 7: Leadership and Commitment**



The 7 Principles are the key characteristics and values that provide the compass for implementing the Framework, and allow for methods to be tailored to individual country needs and circumstances.



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# Overarching Strategic Framework: Goals

- GOAL 1: Effective Geospatial Information Management**
- GOAL 2: Increased Capacity, Capability, and Knowledge Transfer**
- GOAL 3: Integrated Geospatial Information Systems and Services**
- GOAL 4: Economic Return on Investment**
- GOAL 5: Sustainable Education and Training Programs**
- GOAL 6: International Cooperation and Partnerships Leveraged**
- GOAL 7: Enhanced National Engagement and Communication**
- GOAL 8: Enriched Societal Value and Benefits**



The 8 Goals reflect a future state where countries have the capacity and skills to organize, manage, curate and leverage geospatial information to advance government policy and decision-making capabilities.



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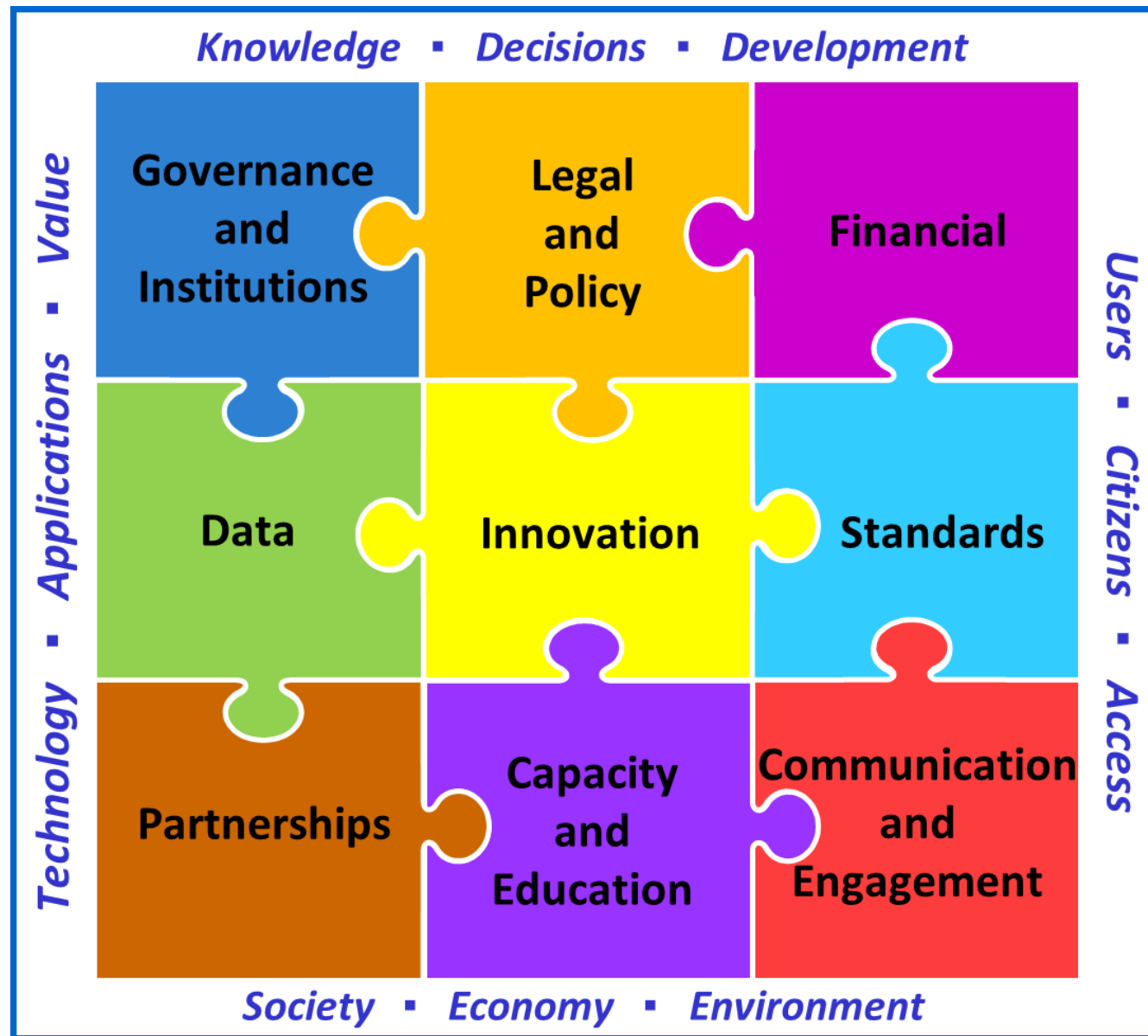
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# 9 Strategic Pathways

Governance →

Technology →

People →



Anchored by 9 Strategic Pathways, the Framework is a mechanism for articulating and demonstrating national leadership in geospatial information, and the capacity to take positive steps.



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Integrated Geospatial  
Information Framework

## Overarching Strategic Framework

Why?

Part 1

National  
Implementation Guide

## Implementation Guide

What?

Part 2

National (or sub-national)  
Action Plans/Delivery System

## Country-level Action Plans

How, when, who?

Part 3



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Implementation



# **GLOBAL UN DATA HUB - FEDERATED INFORMATION SYSTEMS FOR THE SDGS**



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## Welcome to the Open SDG Data Hub

To fully implement and monitor progress on the Sustainable Development Goals, decision makers everywhere need data and statistics that are accurate, timely, sufficiently disaggregated, relevant, accessible and easy to use. The Open SDG Data Hub promotes the exploration, analysis, and use of authoritative SDG data sources for evidence-based decision-making and advocacy. Its goal is to enable data providers, managers and users to discover, understand, and communicate patterns and interrelationships in the wealth of SDG data and statistics that are now available.



# Impact to Member Nations

- Incorporates shared experiences (through narratives), **identifies and disseminates methodologies for SDG indicators, disaggregation, and dissemination as a core knowledge exchange product**
- Allow actors to **convene communities** through technologies and foster an engaging environment around the SDGs that utilize crowdsourcing capabilities, dynamic and engaging visualizations, and shared analytics
- Will **strengthen internal data management** and analytic capacity, harness and promote stakeholder interactions around the SDGs; and in an open standard, open access environment
- Brings “**geo-statistical intelligence**” to SDG activities across multiple organizations, Member States and individuals. Accomplished through a scalable geographic analysis and mapping system that can be utilized anywhere at anytime via the cloud (or hybrid on-site/cloud constellations)



# Member Nations Currently Implementing the Federated Information System for the SDGs

Phase	Country	NSO
1	Senegal	Agence Nationale de la Statistique et de la démographie (ANSD)
1	South Africa	Statistics South Africa
1	Mexico	National Institute of Statistics, Geography and Data Processing (INEGI)
1	Philippines	National Statistical Coordination Board
1	Qatar	Qatar Statistics Authority
1	Ireland	Central Statistics Office
2	Morocco	Direction de la statistique Haut Commissariat au Plan
2	Kenya	National Bureau of Statistics
2	United Republic of Tanzania	National Bureau of Statistics
2	Brazil	Brazilian Institute of Geography and Statistics (IBGE)
2	Colombia	Departamento Administrativo Nacional de Estadística (DANE)
2	State of Palestine	Palestinian Central Bureau of Statistics
2	United Kingdom	UK Statistics Authority; Office for National Statistics (ONS)



# How is the UN operationalizing the Federated Information Systems?

- Provides a foundation to support **training, capacity development and knowledge generation** for maintaining, curating, and disseminating SDG data;
- Create small peer-support groups to facilitate sharing of experiences between NSOs so lessons learned can assist countries that are lagging behind in the implementation of their national Data Hubs, and strengthen National Statistical and Geospatial Systems;
- Documentation for **standard procedures** and **best practices** to deliver a field manual that can be used by UNSD, operational partners, and Member Nations/Institutions implementing their own Data Hubs;
- Provides a roadmap for UNSD and its partners to rollout the Federated Information System for the SDGs initiative.





# Session 4: "Use of geospatial data and earth observations with climate change-related statistics"

Time	Presenter	Title	Institution
09:30 – 09:40	Mark Iliffe	Introduction	UN-GGIM Secretariat
09:40 – 10:00	Steven Ramage	Key-outcomes of the 2018 GEO Symposium on Impacts and the 2018 GEO Climate Workshop with relevance for NSOs	Group on Earth Observations (GEO Secretariat)
10:00 – 10:20	Francesco Tubiello	Geospatial information and Earth observations: Data sources for climate change and disaster statistics	Food and Agriculture Organization (FAO)
10:20 – 10:35	Hermanus Rietveld	Country examples Netherlands	Netherlands Central Bureau of Statistics
10:35 – 10:50	Francisco Jimenez	Country example Mexico	INEGI, Mexico
10:50 – 11:10	All	Discussion	-





# United Nations World Geospatial Information Congress



19-21, November, 2018



DEQING, CHINA

## The Geospatial Way to a Better World

[www.unwgc2018.org](http://www.unwgc2018.org)

<http://ggim.un.org/unwgc>



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