GéoSAT'25
Transformation Digitale et Géomatique Avancée :
Vers une Gestion Urbaine Résiliente et Inclusive
14 -16 mai 2025, FST, Tanger, Maroc

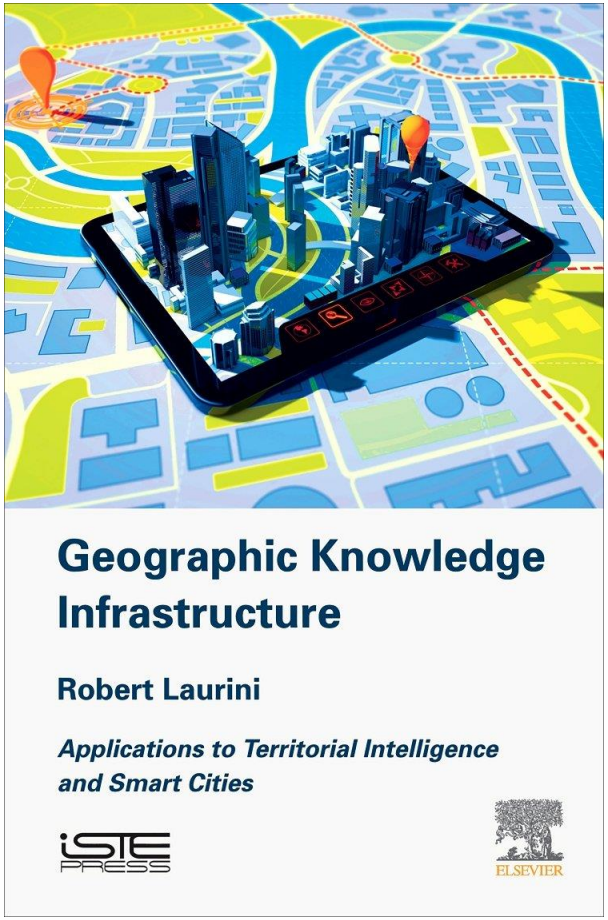
Infrastructure de Connaissances Géospatiales et Développement Durable

Mohamed Timoulali , GTOPIC

CONTENU

- L’information pour la prise de décisions
- Evolution des SDI vers des GKI
- Transformation des Ecosystèmes Géospatiaux
- Cybersécurité et cybercriminalité
- Leadership Géospatial
- Stratégies Nationales Géospatiales et Plans d’action Pays

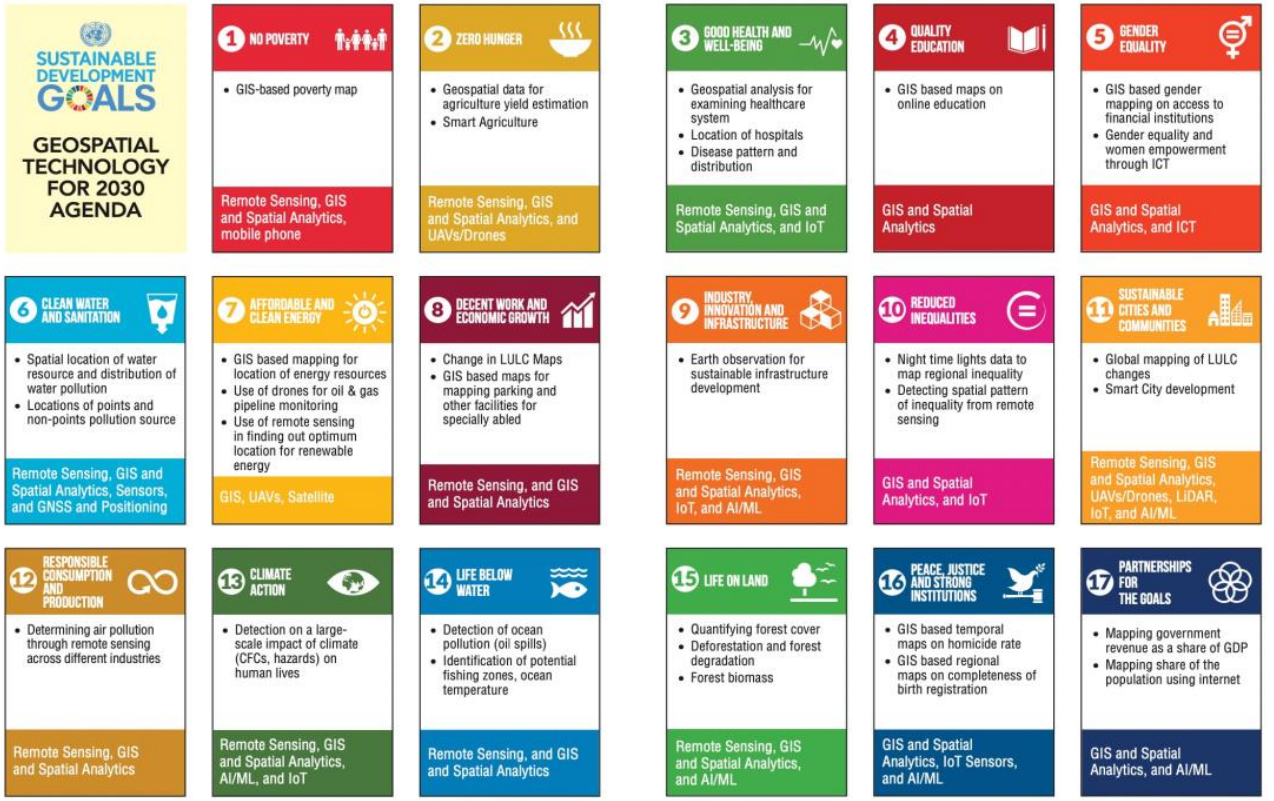
RAPPEL
MORGEO EHTP 16-17 mai 2017



GWF 2025 ‘**Spatial Computing & Digital Twin Enterprise: Accelerating the Future Geospatial Ecosystem**’

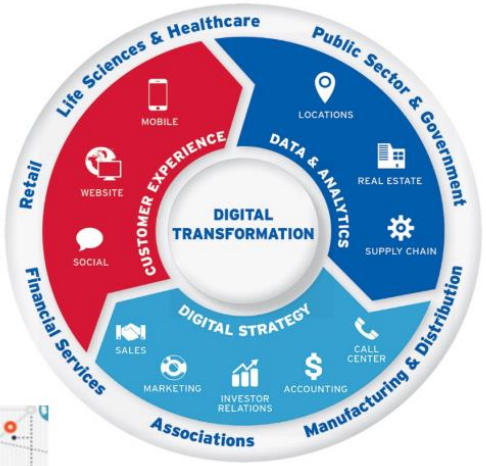
LE CONTEXTE

Geospatial Data and Information Fundamental to Socio-Economic-Environment Workflows



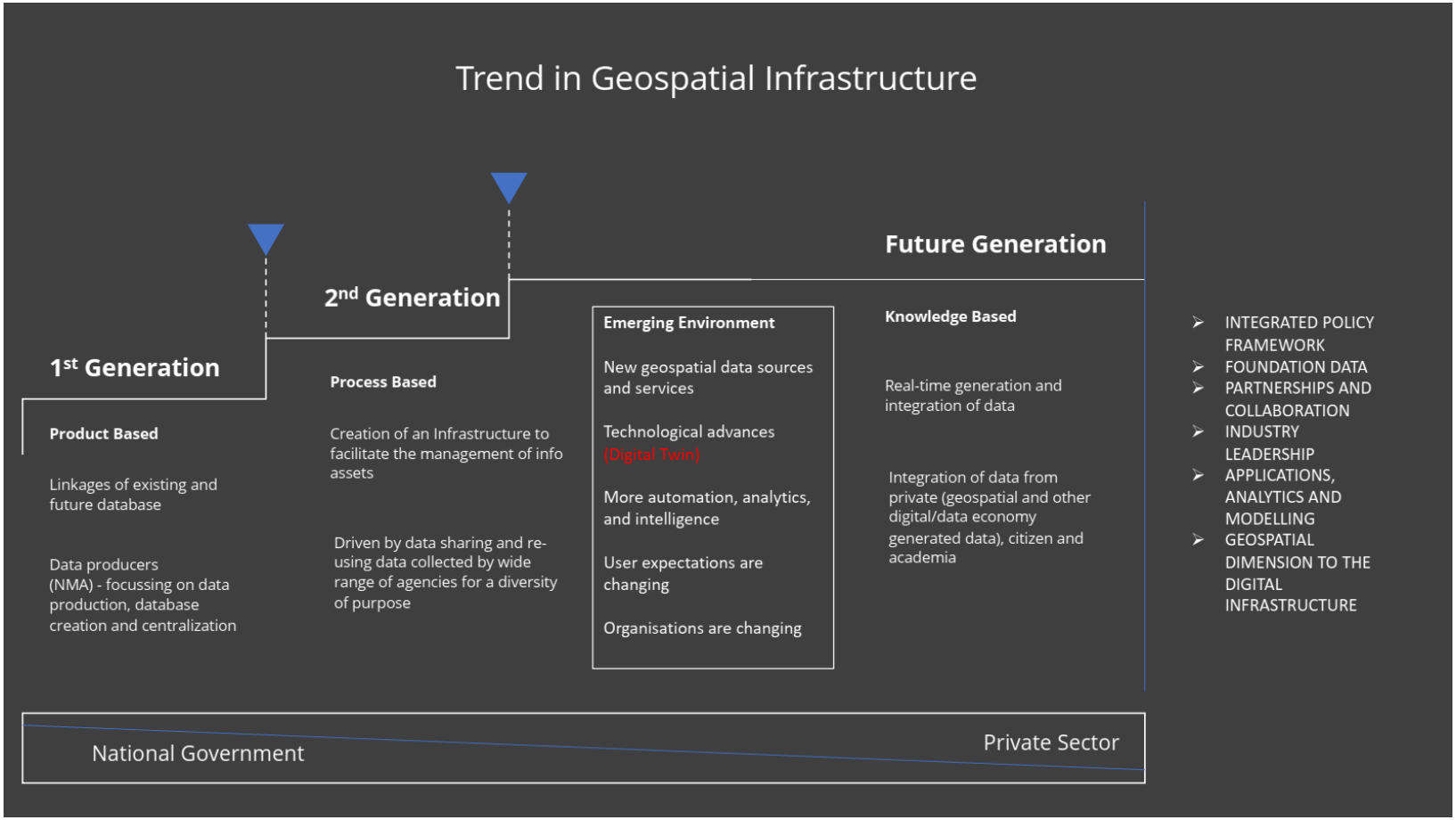
La transformation Digitale

Disruptive nature of digital transformation

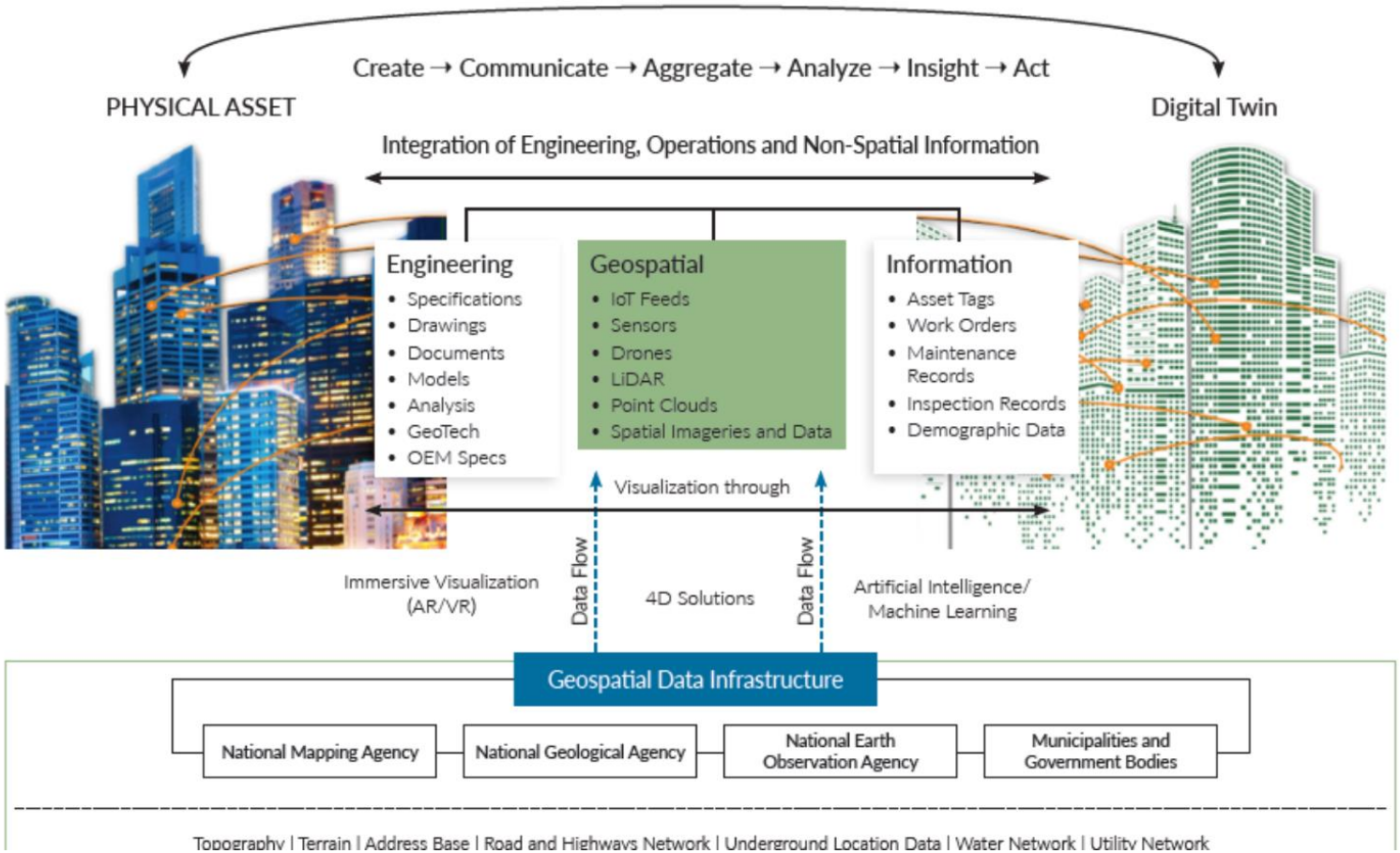


The disruptive nature of digital transformation, technology, innovation, and their exponential impacts, means that society's expectations on how, and at what level of detail, we record what is happening where and when are changing at a rapid pace.

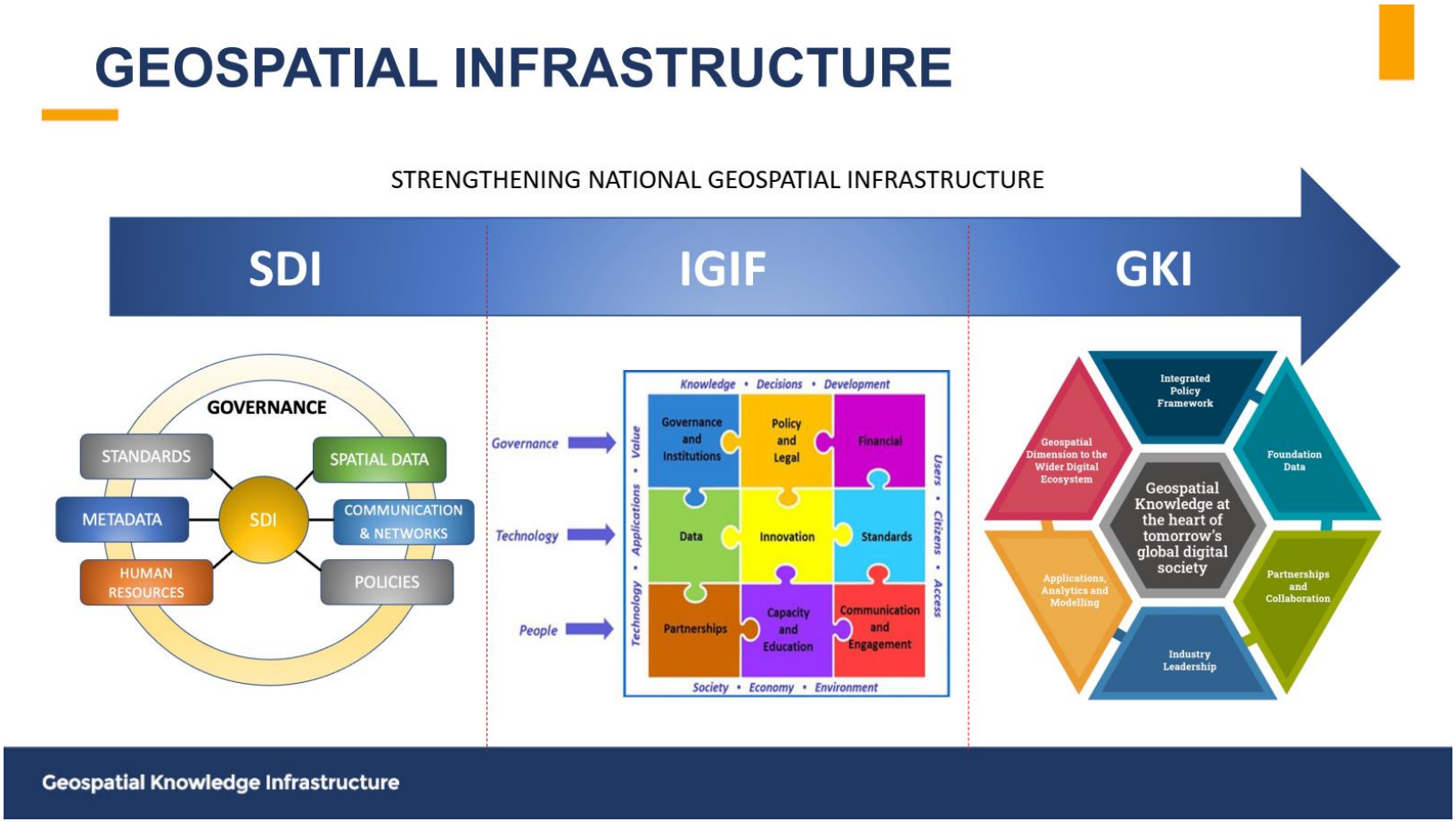
Evolution des GDI



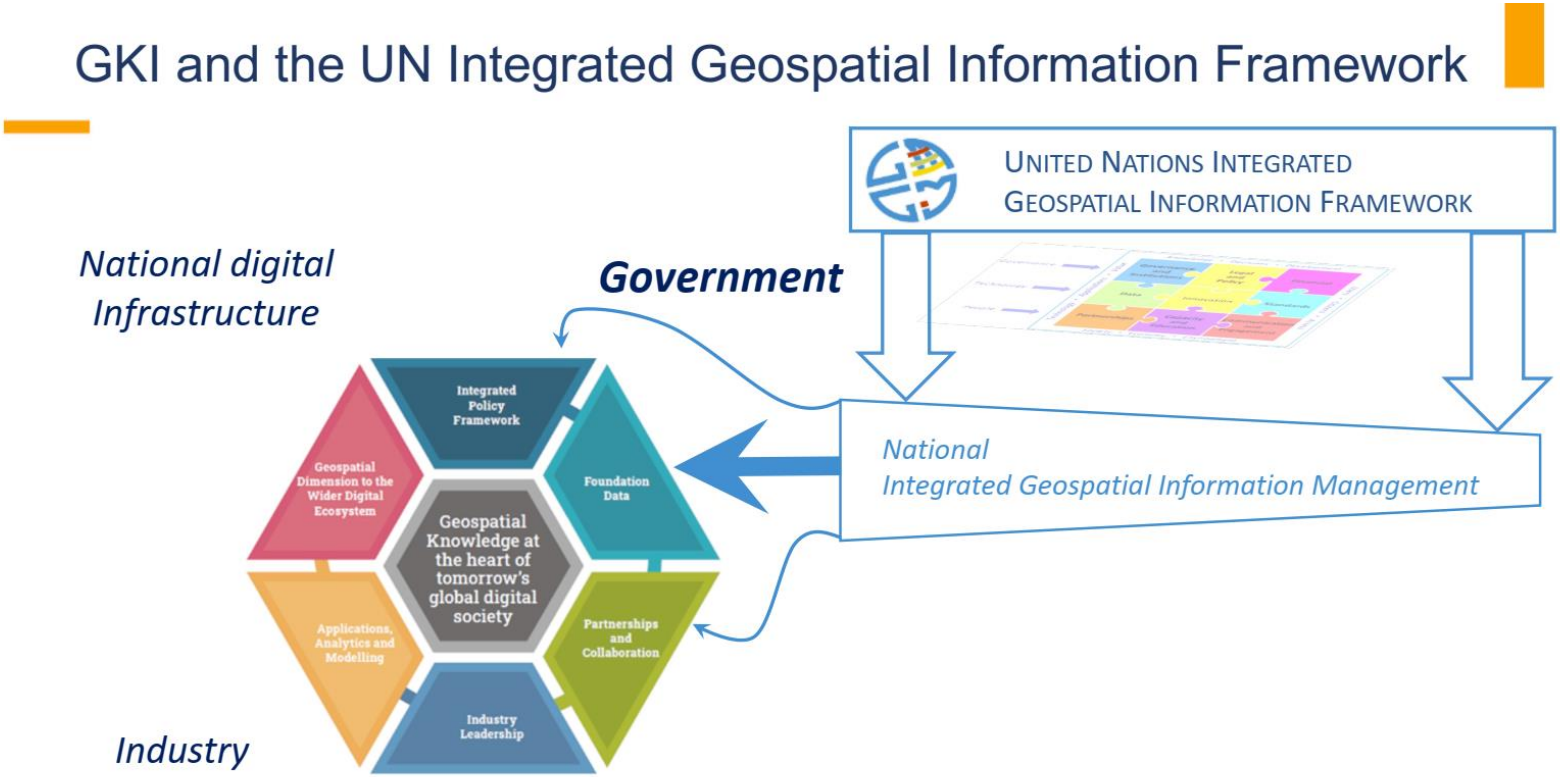
GDI


Create → Communicate → Aggregate → Analyze → Insight → Act
PHYSICAL ASSET
Digital Twin
Integration of Engineering, Operations and Non-Spatial Information
Engineering
• Specifications
• Drawings
• Documents
• Models
• Analysis
• GeoTech
• OEM Specs
Geospatial
• IoT Feeds
• Sensors
• Drones
• LiDAR
• Point Clouds
• Spatial Imageries and Data
Information
• Asset Tags
• Work Orders
• Maintenance Records
• Inspection Records
• Demographic Data
Visualization through
Immersive Visualization (AR/VR)
Data Flow
4D Solutions
Data Flow
Artificial Intelligence/ Machine Learning
Geospatial Data Infrastructure
National Mapping Agency
National Geological Agency
National Earth Observation Agency
Municipalities and Government Bodies
Topography | Terrain | Address Base | Road and Highways Network | Underground Location Data | Water Network | Utility Network

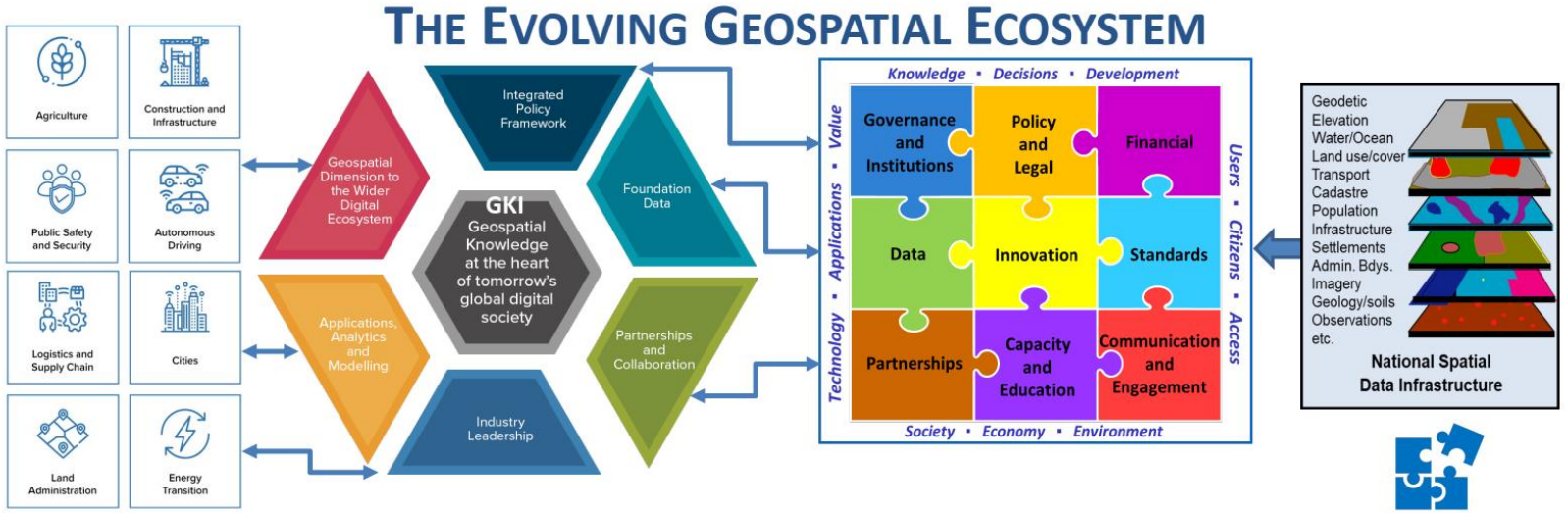
SDI vers GKI


GEOSPATIAL INFRASTRUCTURE
STRENGTHENING NATIONAL GEOSPATIAL INFRASTRUCTURE
SDI
IGIF
GKI
GOVERNANCE
STANDARDS
SPATIAL DATA
METADATA
SDI
COMMUNICATION & NETWORKS
HUMAN RESOURCES
POLICIES
Knowledge • Decisions • Development
Governance
Technology
People
Governance and Institutions
Policy and Legal
Financial
Data
Innovation
Standards
Partnerships
Capacity and Education
Communication and Engagement
Technology • Applications • Value
Users • Citizens • Access
Society • Economy • Environment
Integrated Policy Framework
Geospatial Dimension to the Wider Digital Ecosystem
Foundation Data
Geospatial Knowledge at the heart of tomorrow's global digital society
Applications, Analytics and Modelling
Partnerships and Collaboration
Industry Leadership
Geospatial Knowledge Infrastructure

IGIF et GKI


GKI and the UN Integrated Geospatial Information Framework
United Nations Integrated Geospatial Information Framework
National digital Infrastructure
Government
Integrated Policy Framework
Foundation Data
Partnerships and Collaboration
Industry Leadership
Applications, Analytics and Modelling
Geospatial Dimension to the Wider Digital Ecosystem
Geospatial Knowledge at the heart of tomorrow's global digital society
National Integrated Geospatial Information Management
Industry

Evolution de l'Ecosysteme Geospatial



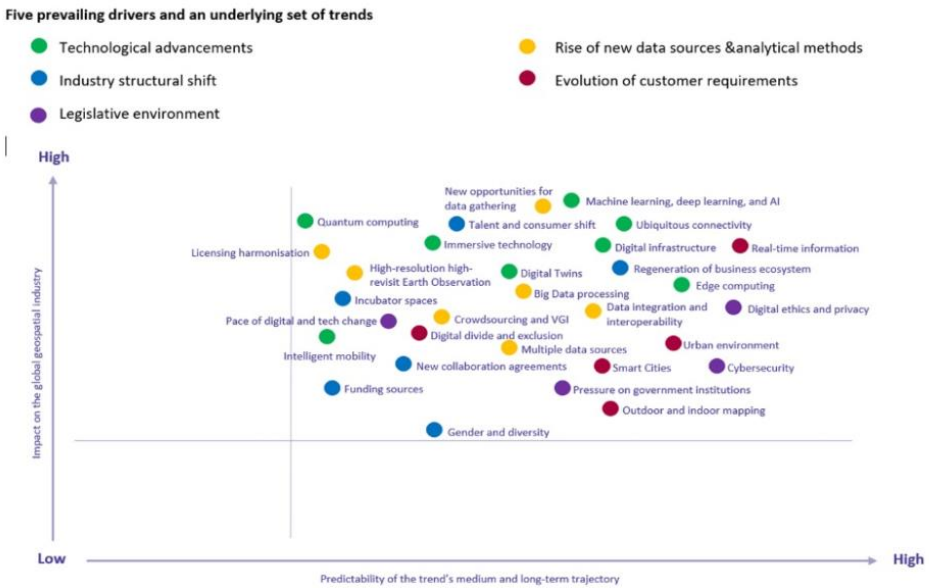
UN-GGIM | United Nations Secretariat
Global Geospatial Information Management

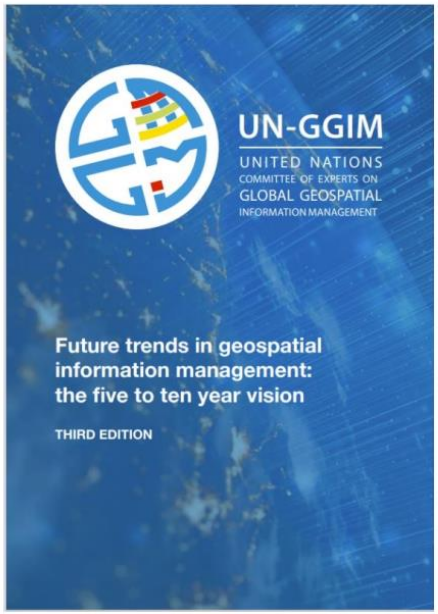
Positioning geospatial information to address global challenges

ggim.un.org

Pourquoi un nouveau concept ?

Why a new concept? Geospatial is changing



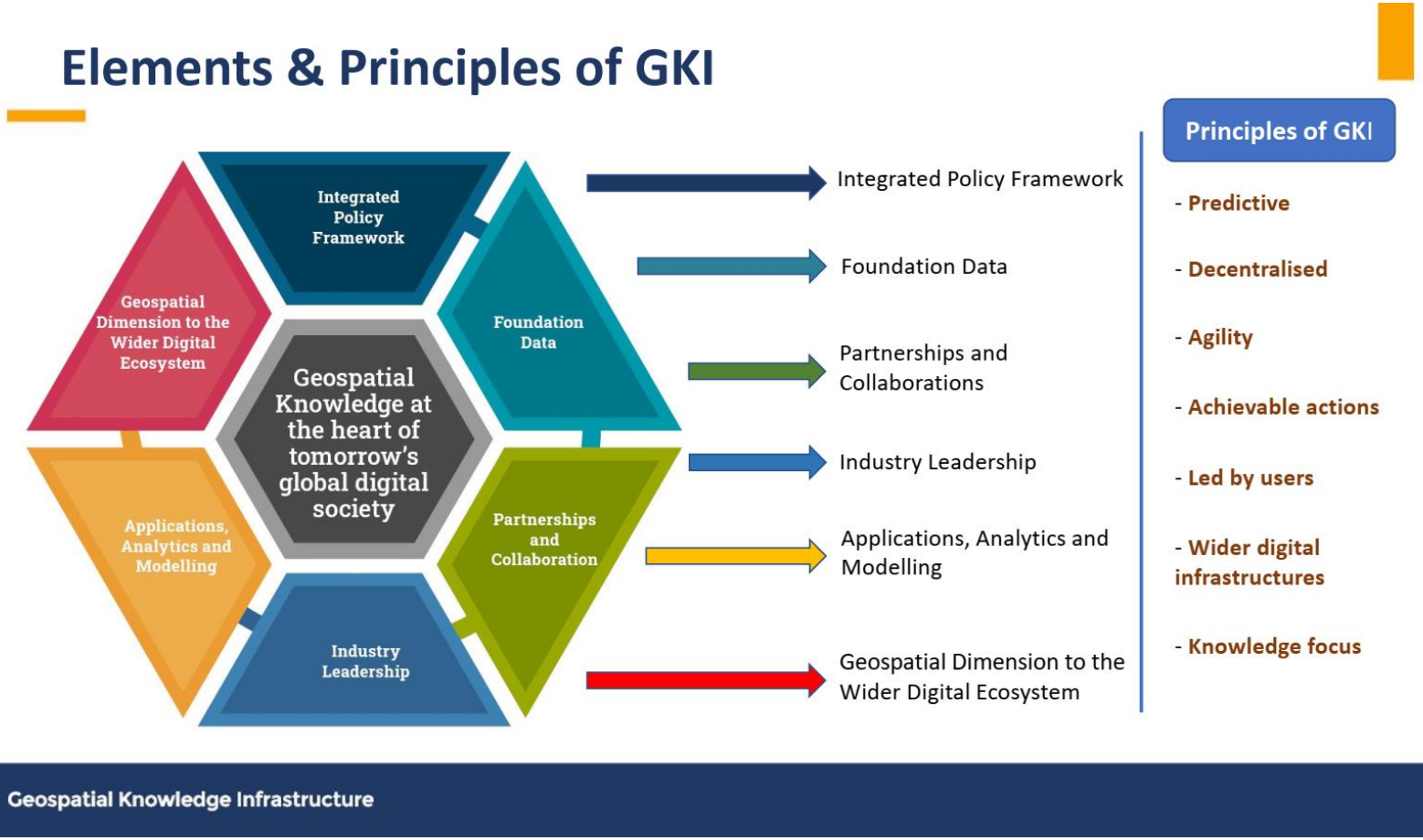


Geospatial Knowledge Infrastructure

https://ggim.un.org/meetings/GGIM-committee/10th-Session/documents/Future_Trends_Report_THIRD_EDITION_digital_accessible.pdf

10

Elements et principes du GKI



IGIF

INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK (IGIF)

- A catalyst for economic growth and opportunity, the IGIF focuses on geospatial information that is integrated with any other meaningful data to solve societal and environmental problems. It also focuses on integrating organizations to deliver national outcomes.
- Recognizing the evolving need to move towards 'knowledge on demand' or a 'knowledge infrastructure', the IGIF fundamentally recognizes, builds upon, and augments previous investments and achievements in planning and implementing SDIs and NSDIs, building additional structure, reasoning, and evidence.
- The IGIF also provides the guidance, options and actions to plan for, develop, and implement an integrated national geospatial information management program, aligned to national strategic priorities, circumstances, and SDGs, within a country. It is a holistic approach to managing and sustaining national geospatial information capabilities and resources. **The IGIF also captures the value of the GKI**.

GKI

GEOSPATIAL KNOWLEDGE INFRASTRUCTURE (GKI)

- As part of this emerging 'knowledge infrastructure', the GKI seeks to bring a geospatial dimension to the wider digital ecosystem - and leveraging innovation and creativity.
- While we in the geospatial community tend to focus on 'geospatial infrastructure', it is really much more than this. Geospatial, like geography itself, is about 'integration' - of data, technology, infrastructure, social, institutional, organizational, partnerships, innovation…and knowledge.
- While the GKI is anchored by geospatial information, its intent is to engage with a broader range of industry sectors - the commercial geospatial industry, national geospatial agencies, broader user industries, and civil society.
- With geospatial information at the heart of the advancing knowledge environment, the GKI aims to move the geospatial sector closer to the wider 4IR data ecosystem, focusing on delivering knowledge to support human and machine decision-making, with cognition as the path from data to insights, knowledge, and understanding….and anchored by location.

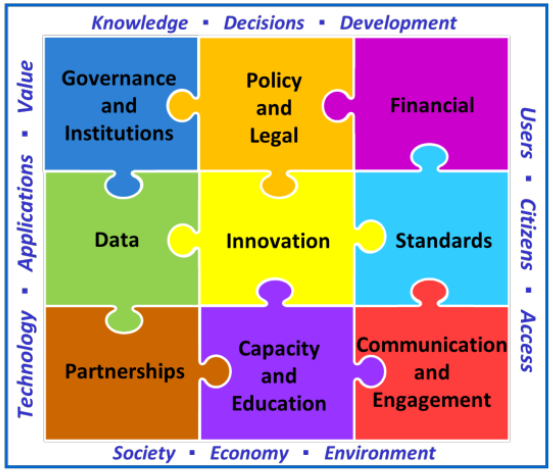
Integration IGIF et GKI

INTEGRATING THE IGIF AND THE GKI

"Driven through a geospatial industry perspective, the GKI aims to move the geospatial sector closer to the wider Fourth Industrial Revolution data ecosystem, focusing on delivering knowledge to support human and machine decision-making.

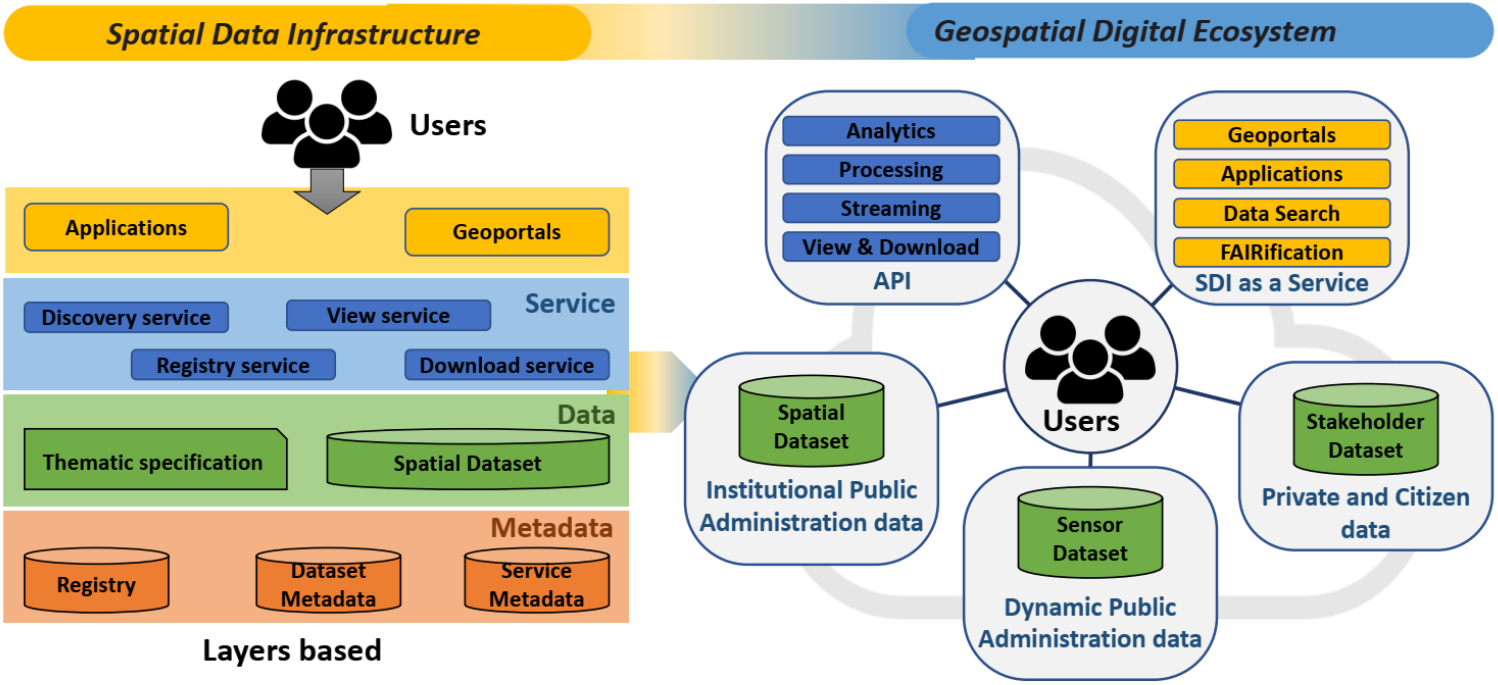
In parallel, the GKI will increase the use of geospatial data, information and knowledge across business and government, setting the conditions for better evidence-based decisions.

In this regard, the GKI will build upon the IGIF as a coherent set of elements that will contribute to bringing geospatial cognition to the heart of the data, knowledge and decision-support ecosystem"



Du SDI à l'Ecosystème Geospatial

From SDI to Geospatial Digital Ecosystem

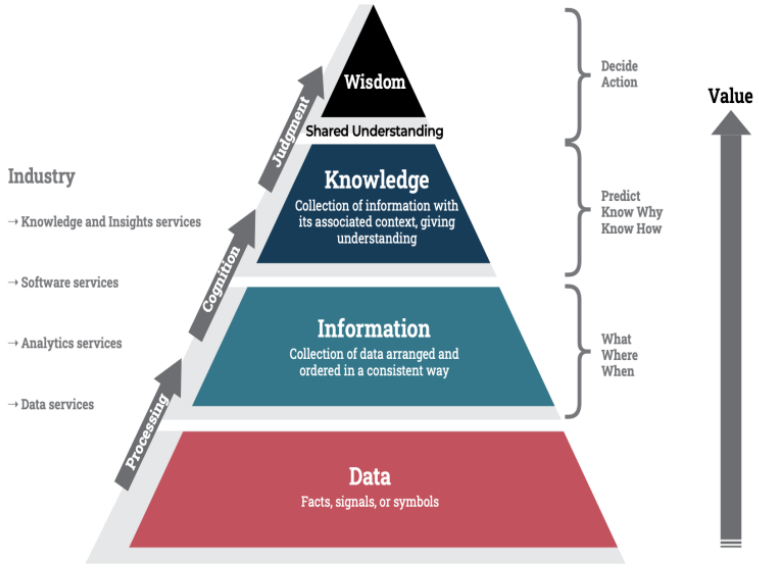


GKI et le futur Ecosystem Geospatial

GKI as an enabler for the future geospatial ecosystem

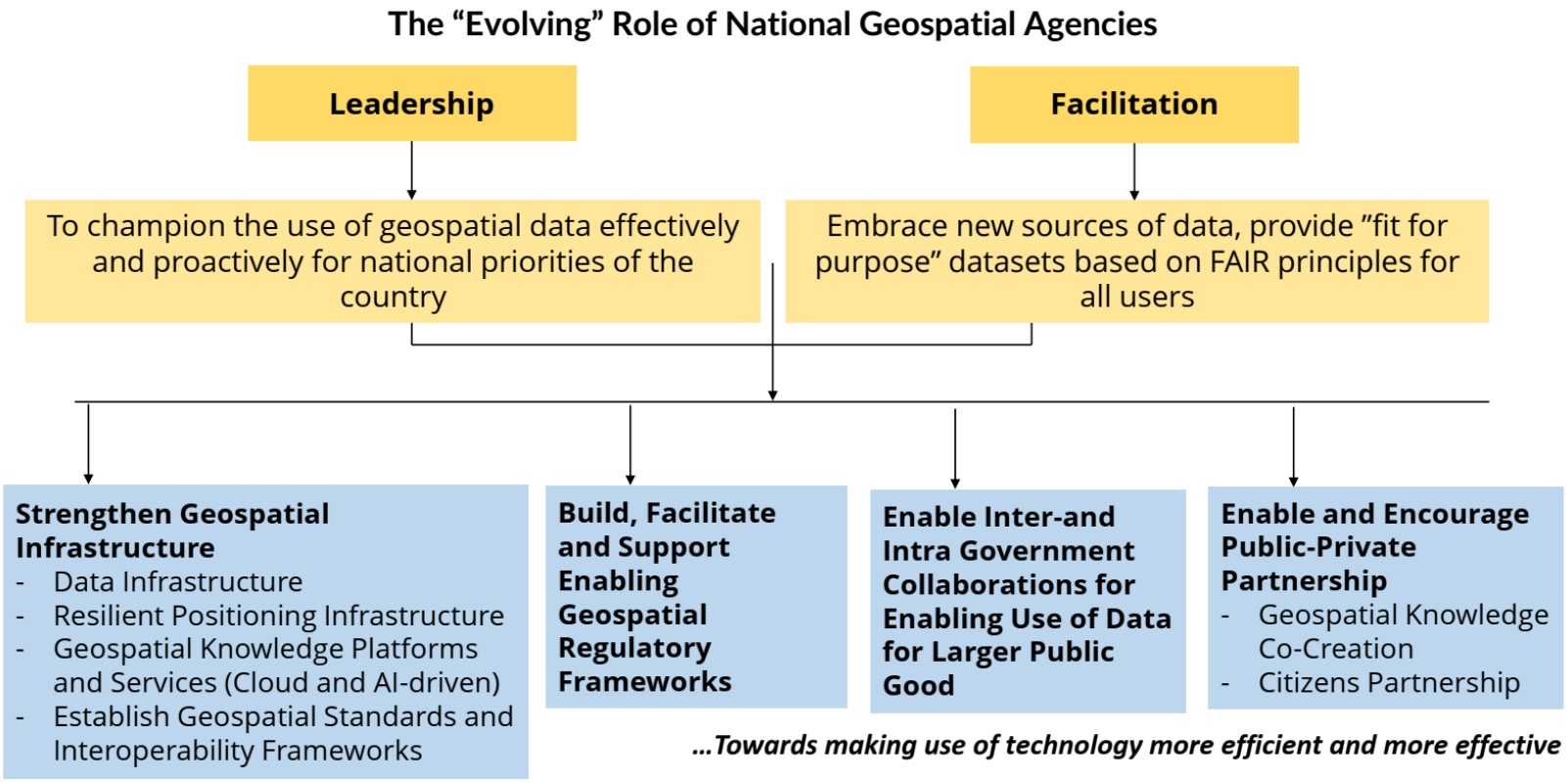
Salient Features of Future Geospatial Ecosystem

1. Digital Technology Advancement
2. New Geospatial Technology Innovations
3. Emphasis on Geospatial Data and its Dynamics
4. Analysis and Automation
5. Evolving role of Federal Geospatial Data Providers
6. Advancing User Demands and Expectations and Realignment of Business Models
7. Focus on Strategic National Priorities and SDGs



Geospatial Knowledge Infrastructure

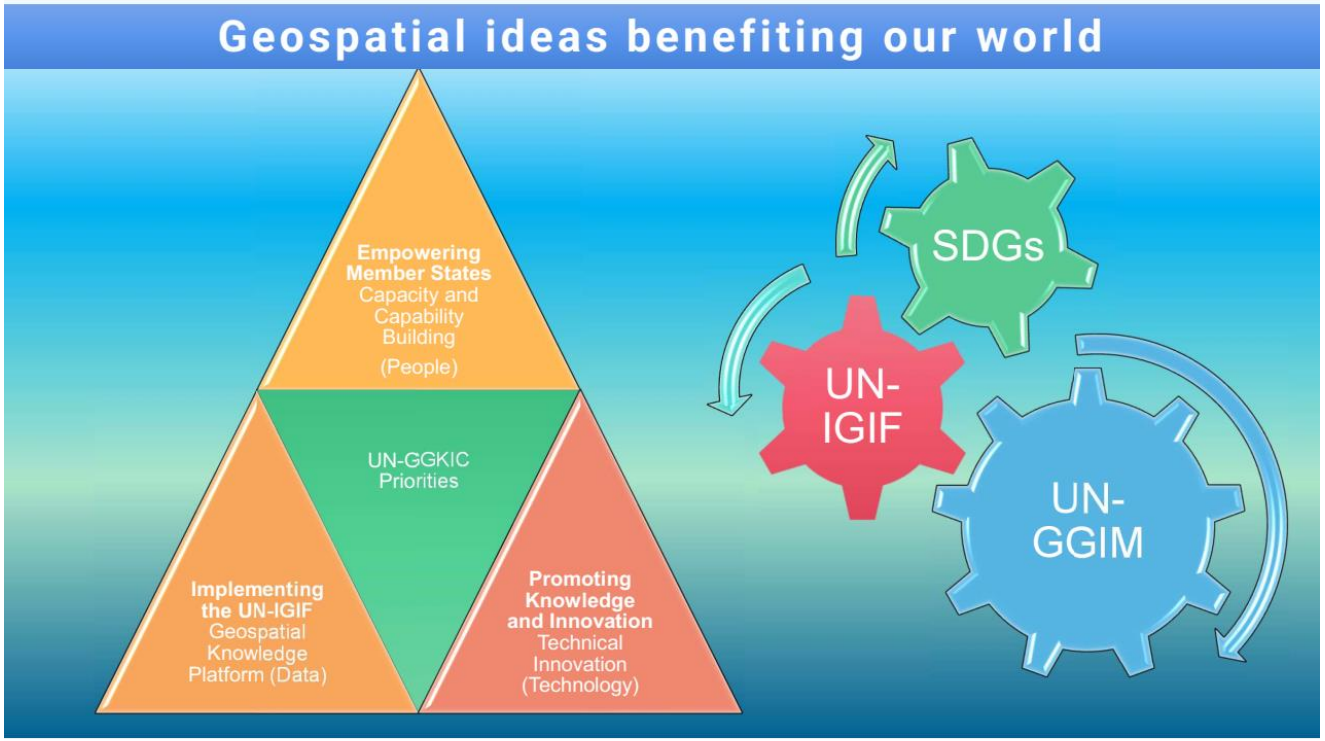
Roles des NGA



Source: Geospatial Industry Advancing Sustainable Development Goals, Geospatial World Analysis; Eurogeographics document

GW CONSULTING

Rôle de l'UN-GGKIC



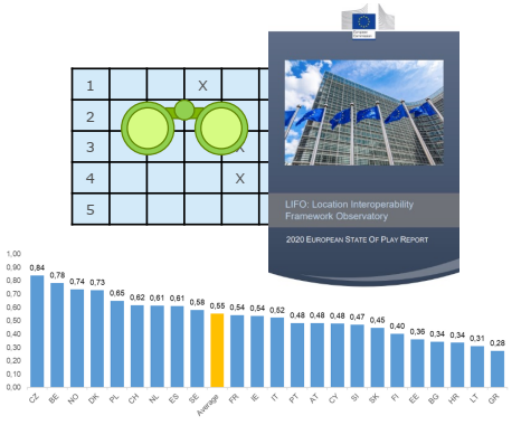
Cas de l'Union Européenne

European Union Location Framework (EULF) Blueprint

A **European 'location interoperability framework'** with **guidance** for the exchange and use of location information in government policy and digital public services, building on the implementation of **INSPIRE**, and allied closely to the interoperability principles of the **EIF**

Online and downloadable versions

- 5 FOCUS AREAS
- 19 RECOMMENDATIONS
- 6 ROLES
- 2 RELATED FRAMEWORKS
- 92 BEST PRACTICES
- 15 BENEFITS ILLUSTRATIONS



Adoption monitored through the LIFO

European Union Location Framework (EULF) Blueprint | Joinup

Location Interoperability Framework Observatory (LIFO) | Joinup

European Commission

Package d’intéropérabilité

Why a legislative interoperability package?

EU's digital strategy

- Digital Decade: Key public services 100% online by 2030
- Cross-border interoperability as an enabler

Gaps in existing legislation

Inefficient governance of interoperability efforts between EU policies, the Commission and Member States for all administrative levels and sectors.

Lack of common minimum interoperability specifications, shared solutions, standards.

Lack of an 'interoperability-by-default' approach in the design and implementation of EU and MS's legislation and policies.

interoperable europe Act

European Commission

Stratégie européenne des données

European strategy for data

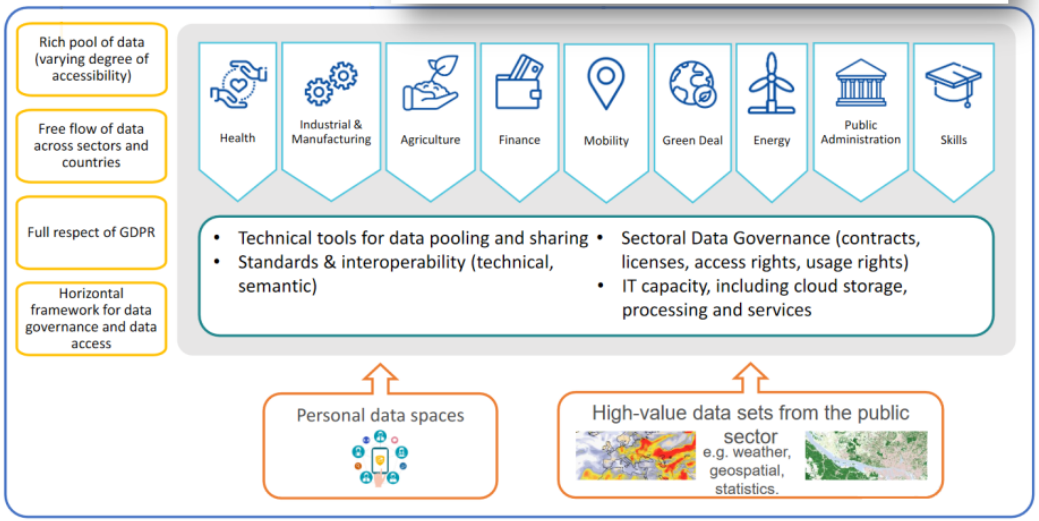
- Aims to create a European single market for data
- Highlights the problems to address
  - data availability, interoperability, quality
  - governance & infrastructures
  - skills & data literacy
  - cybersecurity
- Envisages establishing
  - common European sectoral data spaces


EUROPEAN COMMISSION

Brussels, 19.2.2020
COM(2020) 66 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

A European strategy for data



https://digital-strategy.ec.europa.eu/en/policies/strategy-data

Implémentation des HVD

Implementing Act on high-value datasets

- High-value datasets (HVD)
  - datasets the re-use of which is associated with important socio-economic benefits
- To be made available
  - for free, under open access licenses (CC BY 4.0 or less restrictive)
  - in machine-readable formats, via APIs and (when relevant) as a bulk download
- Thematic categories of HVD

Geospatial	*Earth observation and environment*	*Meteorological*	*Statistics*	*Companies and company ownership*	*Mobility*

- The Implementing Act defines
  - the list of high-value datasets for each thematic category
  - the requirements for their provision: key attributes, granularity, formats, license, etc.

European Commission

Cybersécurité et cybercriminalité

CONFIANCE ET SÉCURITÉ DANS LE CYBERESPACE

DE MOHAMED TIMOULALI | 03/10/2014 - 10:41 | TIC

La confiance étant un volet important de toute stratégie numérique, la CEA l'a abordée dans les stratégies nationales, mais l'a…

SUITE

TAGGÉ CER, ConventionAfricaine, Cybelegilation, cybersecurité

DONNÉES GÉOSPATIALES ENTRE EXIGENCES DE DÉVELOPPEMENT DURABLE ET IMPÉRATIF DE SÉCURITÉS NATIONALES

DE MOHAMED TIMOULALI | 21/02/2021 - 11:23

COOPÉRATION SUD SUD, GEOMATIQUE, GOUVERNANCE FONCIÈRE, SIG, TIC

Dans de précédentes publications j'avais abordé les aspects liées la gestion des données spatiales : Planification Stratégiques, cadres institutionnels et légaux…

SUITE

TAGGÉ cybersecurité, FELA, INDG, NSDI, Open Data, Sectoral Strategies, Transformation digitale

UN-GGIM Arab States

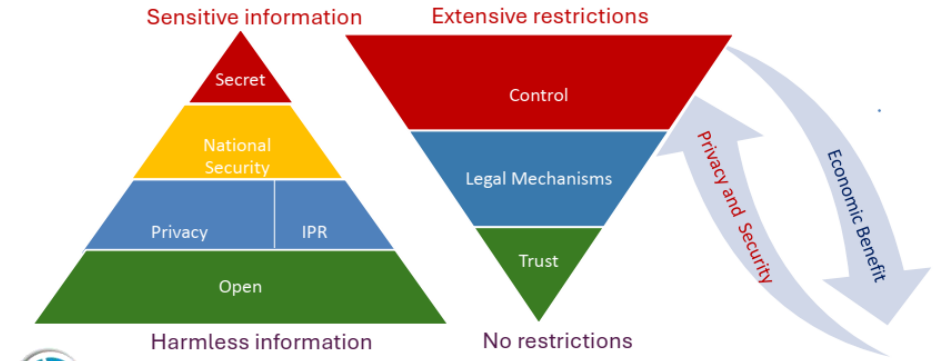
UN-IGIF et sécurité

UN-IGIF advice on geospatial information security

- Maximize the utility of geospatial information **as well as protect a country or organization against potential security risks.**
- Balance between making information openly available for public good and economic growth and the security of sensitive information.
- Notes that geospatial policies are strongly related to policies such as national security, privacy, intellectual property rights and open data.
- Notes that collaboration improves trust, confidence and security.
- Notes that Integrated geospatial information is a powerful tool for determining appropriate policy interventions and decisions for …. national security.
- Asks countries to consider what restrictions will be applied and how these should be decided.

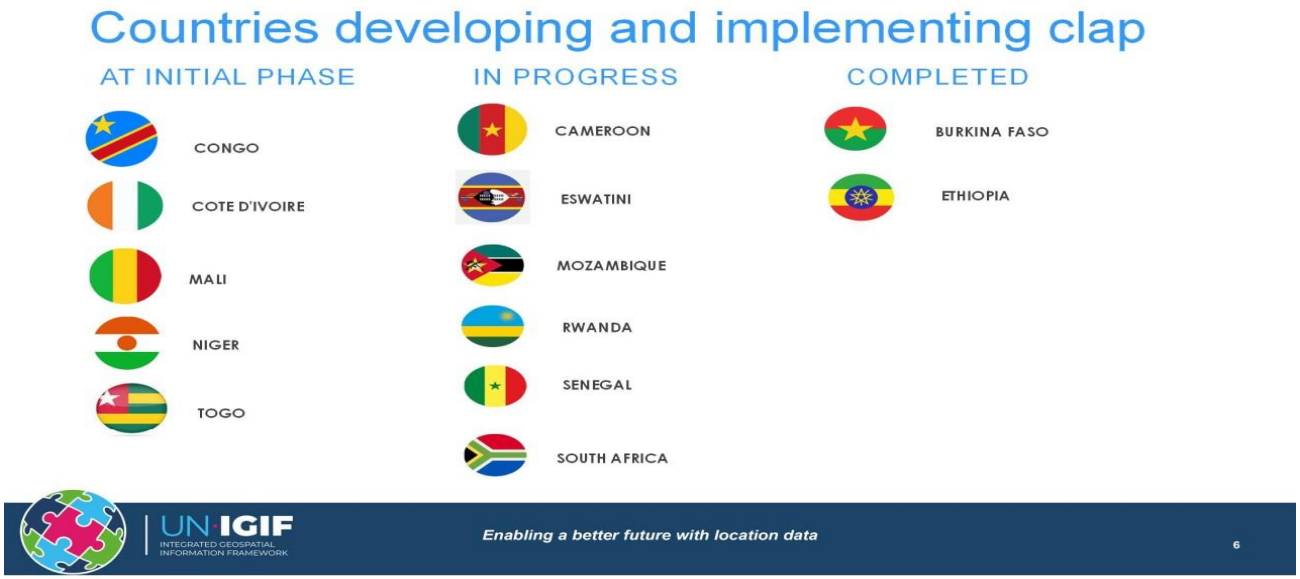
UN - GGIM : ARAB STATES | UNITED NATIONS INITIATIVE ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT FOR ARAB STATES www.un-ggim-as.org

The UN-IGIF judgement on controls v release



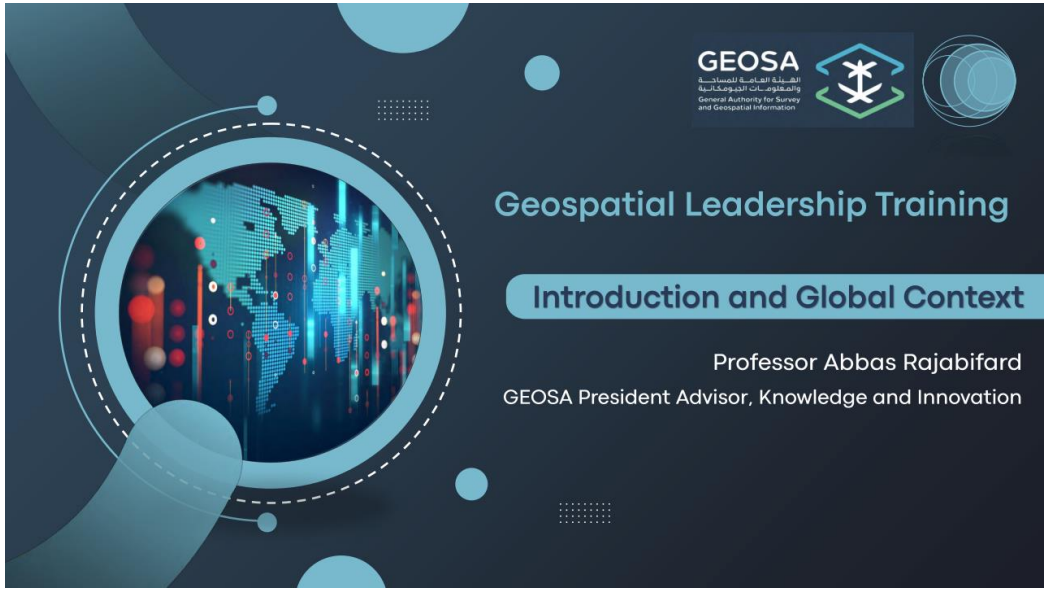
UN - GGIM : ARAB STATES | UNITED NATIONS GLOBAL GEOSPATIAL INFORMATION MANAGEMENT FOR ARAB STATES www.un-ggim-as.org

Stratégies Nationales Géospatiales et Plans d'action Pays



https://ggim.un.org/meetings/2025/Maputo/documents/I-2.2_Status_Report-UN-GGIM_Africa_Region.pdf

Leadership Géospatial

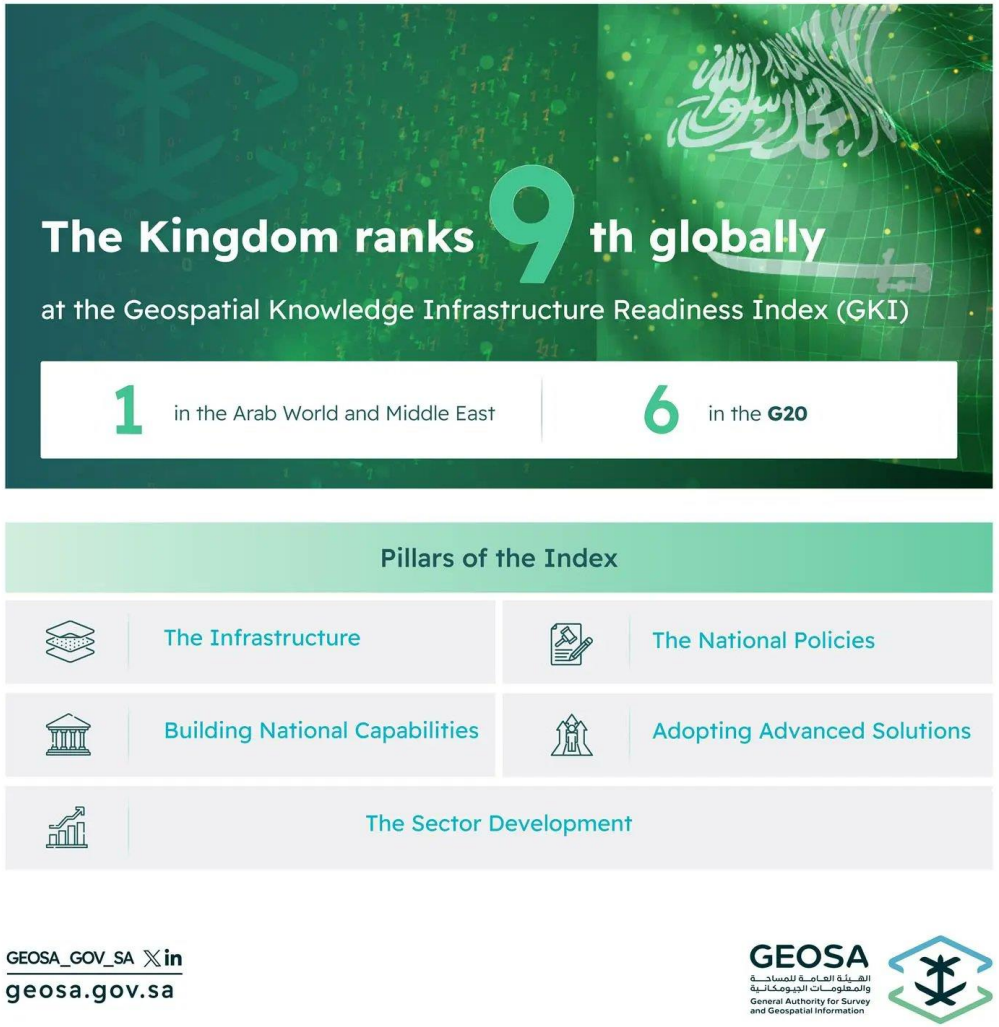


GEOSA récompensée à l’international

The Gary Nairn Medal for Leadership

Prix de l’Agence Géospatiale Nationale de l’année

Impact sur le classement GKI index 2025



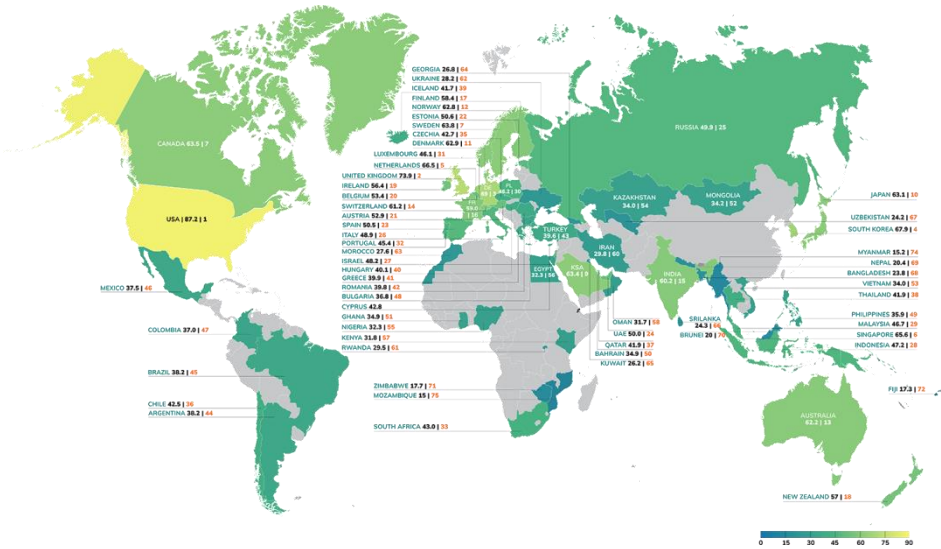
GKI index 2025

Top Three GKI-Ranked Countries by Region

1 Americas	2 Europe	3 Africa	4 Asia Pacific	5 Arab States
1.United States	1.United Kingdom	1.South Africa	1.South Korea	1.Saudi Arabia
2.Canada	2.Germany	2.Ghana	2.Singapore	2.UAE
3.Chile	3.The Netherlands	3.Nigeria	3.Japan	3.Qatar

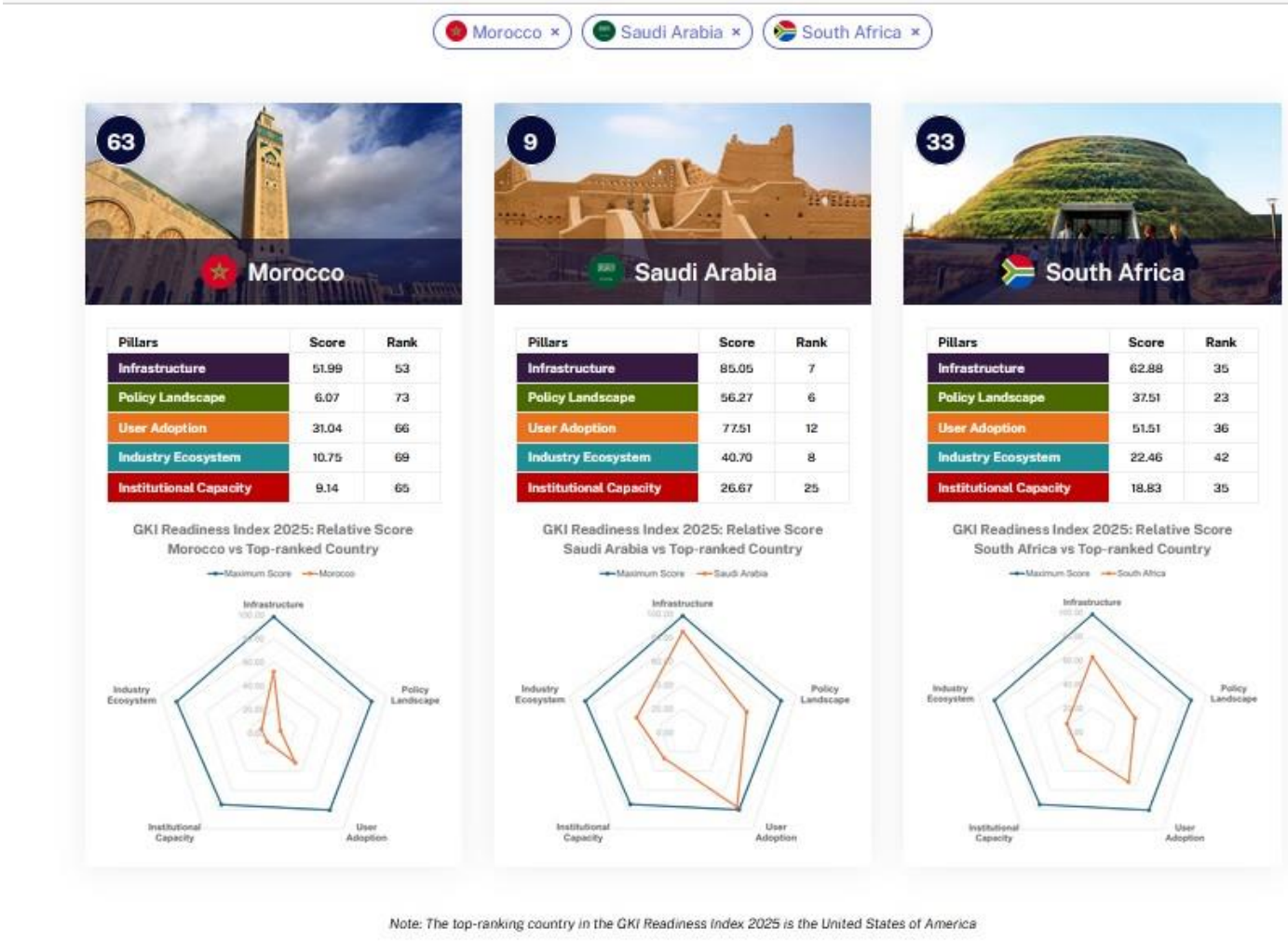
Top Three GKI-Ranked Countries by Income Group

High Income	Upper Middle Income	Lower Middle Income	Low Income
1.United States	1.Indonesia	1.India	1.Rwanda
2.United Kingdom	2.Malaysia	2.Philippines	
3.Germany	3.South Africa	3.Ghana	



https://geospatialworld.net/consulting/reports/gki-readiness-index/2025/pdf/gki-readiness-report-2025.pdf

Classement GKI du Maroc



Note: The top-ranking country in the GKI Readiness Index 2025 is the United States of America

Pour plus d'informations, visitez :

- https://geospatialworld.net/gwf/2022/
- https://geospatialworld.net/gwf/2023/geospatial-knowledge-infrastructure.php
- https://geospatialworldforum.org/gki-training-programme.php
- https://www.un-ggim-as.org/Workshop%20on%20Geospatial%20Security.pdf
- https://ggim.un.org/UN-IGIF/
- https://ggim.un.org/Expert-Group-LAM.cshtml/
- From Spatial Data Infrastructure to Geospatial Knowledge Infrastructure: the Role of Management and Financing Models

Martin Saeter (Norway) FIG Working Week 2024 Your World, Our World: Resilient Environment and Sustainable Resource Management for all Accra, Ghana, 19–24 May 2024