Geospatial Information Management:
The Integrated Geospatial Information Framework
Land Administration

UN-GGIM ASIA PACIFIC
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Relevance of Geospatial Technology and Information

From Global….

Sustainable Development Goals rely on geospatial technology to achieve the targets and use location as an information integrator

To National/Local….

4th Industrial Revolution
Smart and Resilient Cities
E-Government
Precision Agriculture…

Require accurate and current geospatial data

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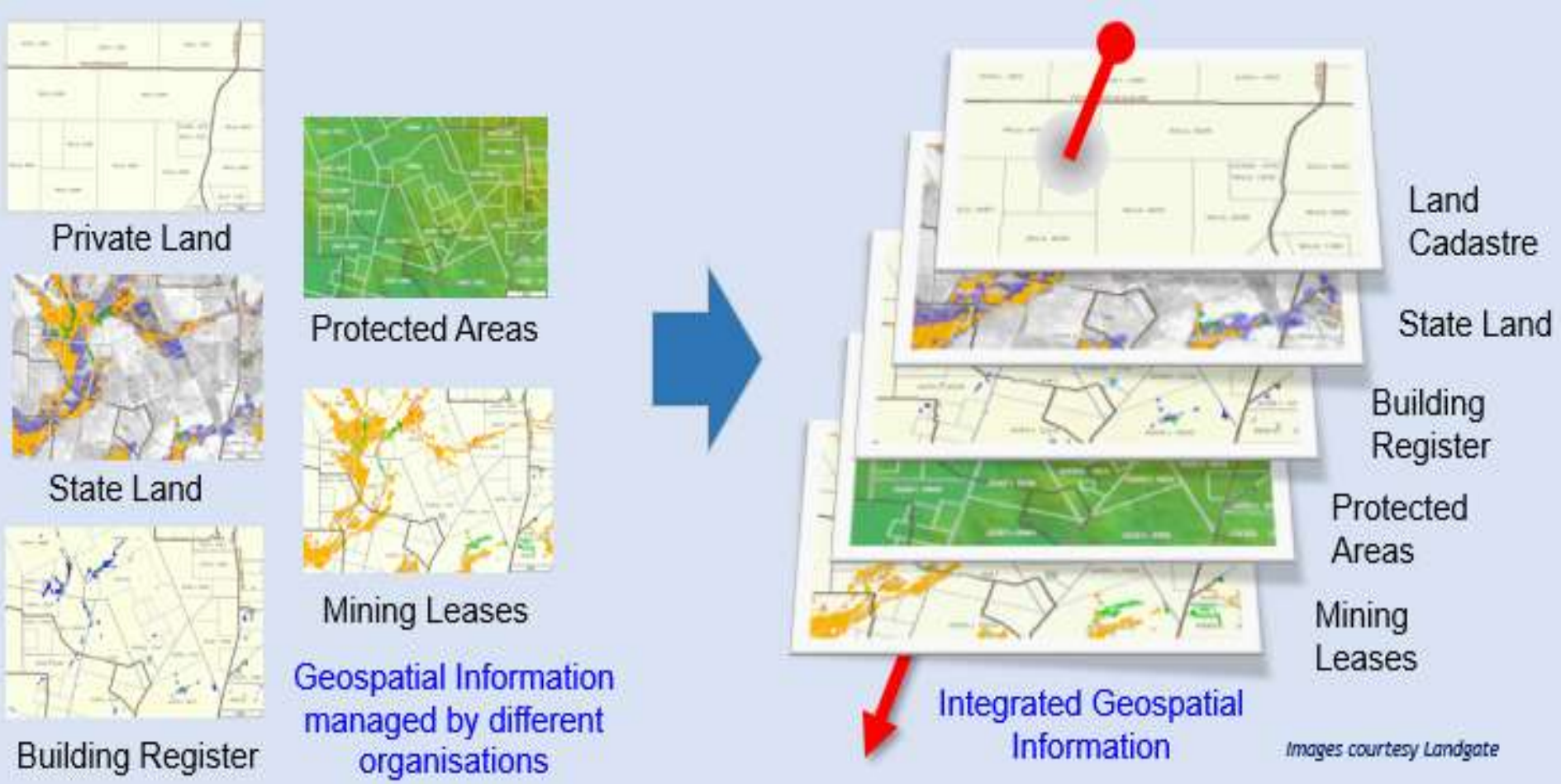
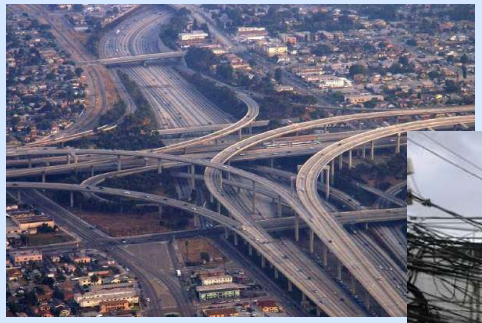
Location as an Information Integrator



Geospatial Data **Infrastructure**: Importance of Investment



Transport

Energy

Well established business lines exist for traditional infrastructure

Data require a new infrastructure: National Information Infrastructure and Spatial Data Infrastructure (SDI)

Significant financing is needed for SDI globally:

Mapping agencies must convice decision makers to invest in SDI and more evidence is needed

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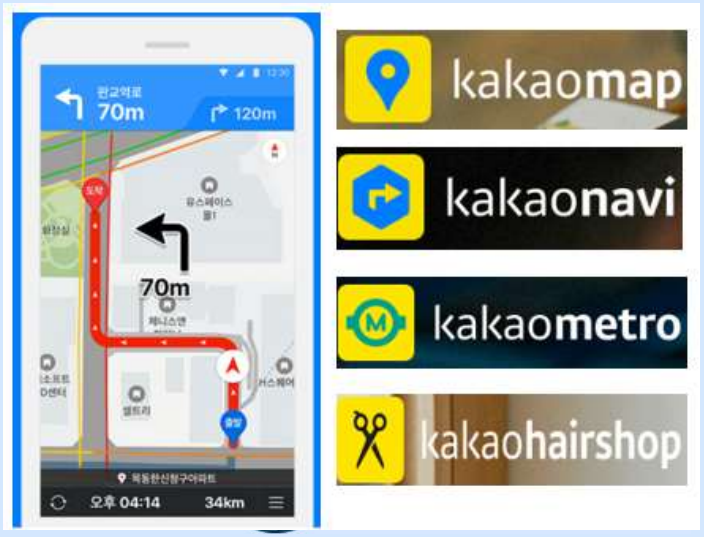
IGIF: Why is a Global Framework needed?

- Economies are changing….
  - E-government, E-services, E-commerce
  - Smart Cities, autonomous vehicles, Grab
  - Climate Change, Disaster Risk Management
- Most of these functions/applications **require location based information**
- There is **big divide between developing and developed countries**
- **Governments have enabling role** for the development of Geospatial Infrastructure at the National and Local levels
- Current investment in geospatial data and systems is often **siloed, duplicative and inefficient**



Strategic Partnership: World Bank- United Nations

Committee of Experts on Global Geospatial Information Management (UN-GGIM)

"Bridging the Geospatial Digital Divide"
Signed August 2017

The aim is to:

1. Develop an **overarching Geospatial Framework** for countries to reference when developing their national and sub-national spatial data infrastructures (SDIs).

2. Assist countries to prepare and implement **Country-level Action Plans** to operationalize the Geospatial Framework, with a particular focus on *low and middle income countries*

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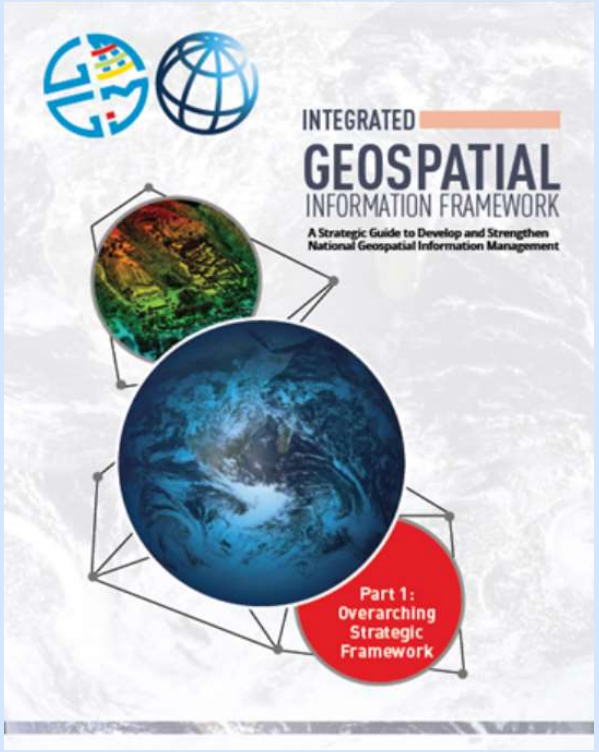
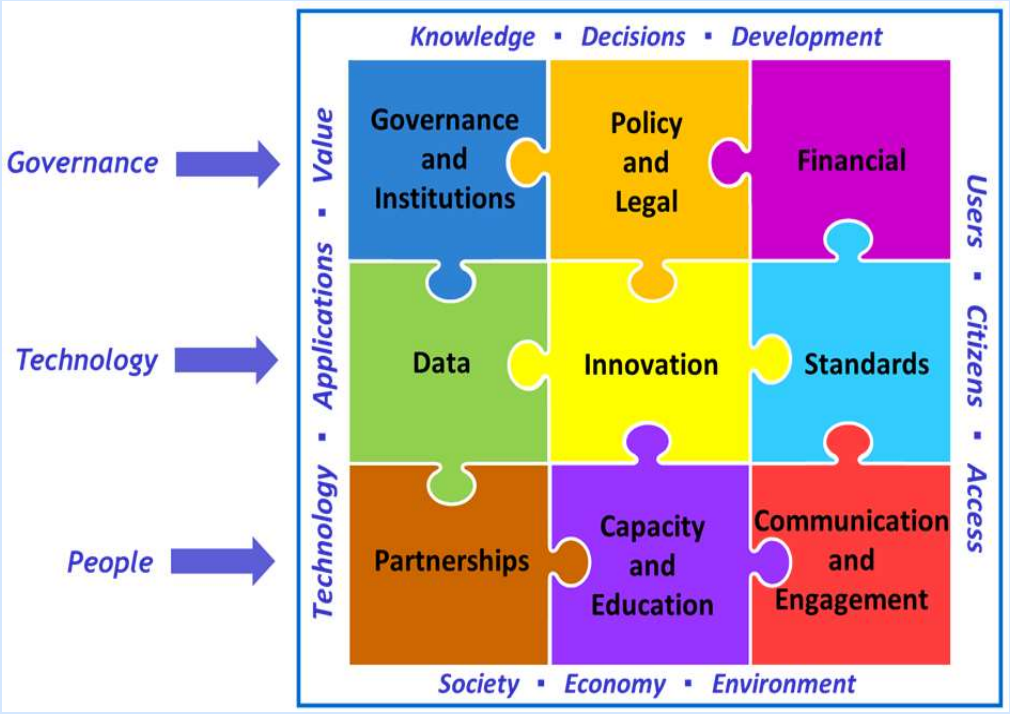
Integrated Geospatial Information Framework (IGIF)

The IGIF was **adopted by member states in August 2018.** It provides a holistic view of geospatial information management through 9 Strategic Pathways.





http://ggim.un.org/meetings/GGIM-committee/8th-Session/documents/

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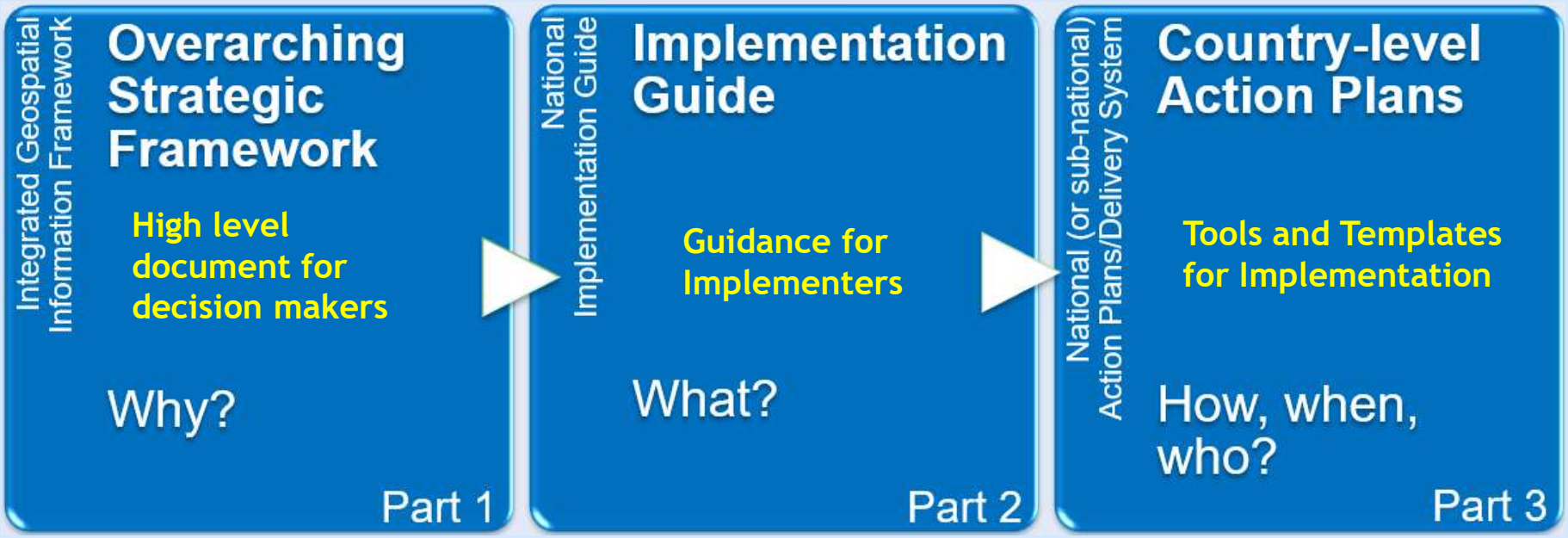
Structure of the IGIF: 3 interlinked parts



Adopted by UNGGIM August 2018

Consultation on first draft began at World Bank in March 2019, consultations to conclude end 2019; adoption by UNGGIM in 2020

World Bank team developed toolkit and conducted pilots in FY19;scale up in FY20

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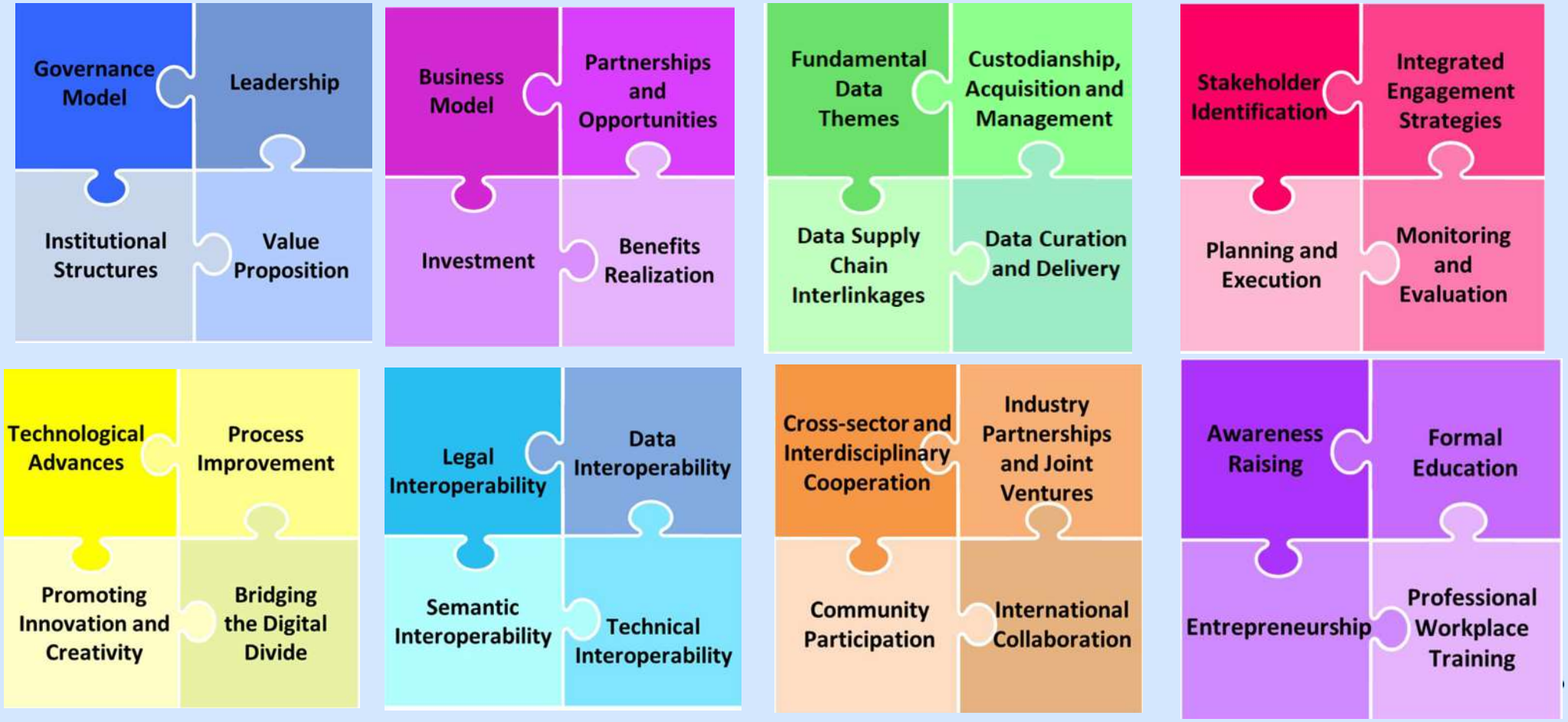
IGIF Implementation Guide: Details for each Strategic Pathway



Country Level Implementation

World Bank Global Geospatial/Land Team Approach with UN-FAO and other partners

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IGIF Country Level Implementation Methodology

1. **Diagnostic/Country report**
2. **Business case**
   - Alignment to Policy/ Business Drivers
   - Socio-Econ analysis
3. **Action and Investment Plan**

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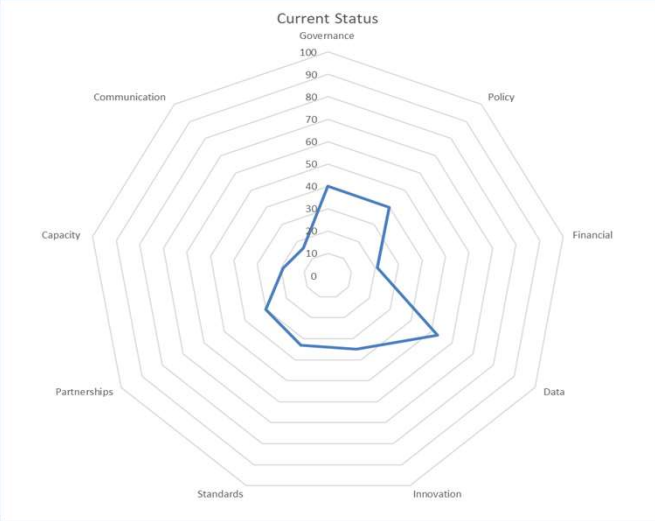
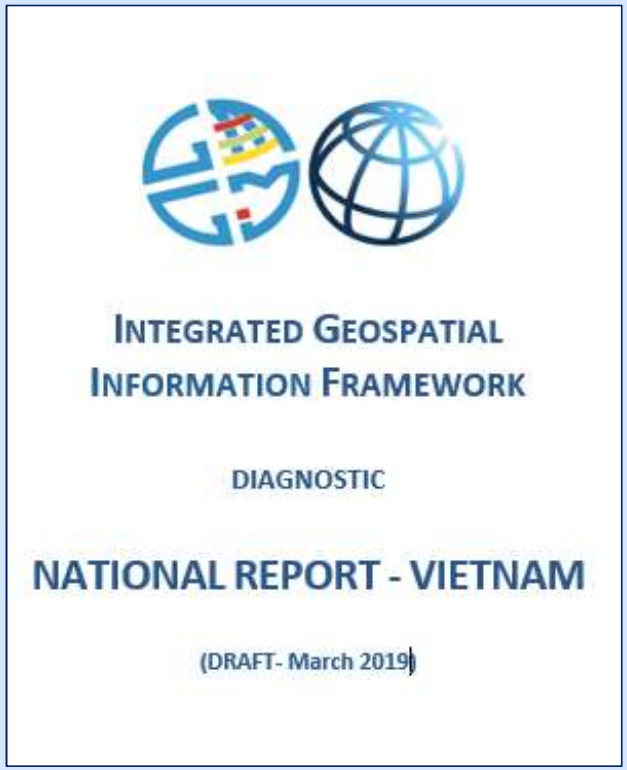
Diagnostic: Baseline Assessment

	1. Governance and Institutions	Current
1.1	Is there a NSDI "champion" in Government?	50
1.2	Is there a NSDI Coordinating body?	25
1.3	Is the NSDI Coordinating body represented at senior / top level in government?	75
1.4	Is the coordinating body supported by an active secretariat?	25
1.5	Are there clear Terms of Reference (ToR) for the Coordinating Body?	50
1.6	Does the coordinating body actively reach out to all levels of government (including local government) and other	25
1.7	Are there Working Groups supporting SDI development? e.g. technical, standards, legal, service development)?	50
1.8	Is there a user group / forum available for consultation and providing user feedback / requests?	25
1.9	Does the national "champion" actively interact with the global and regional geospatial community?	25
1.10	Are there linkages between the coodinating body and those developing the e-Government agenda?	50
	Pathway Score	**40**

Overall country score

	Current Status
Governance	40
Policy	40
Financial	21
Data	53
Innovation	35
Standards	33
Partnerships	30
Capacity	19
Communication	16
Overall Score	32





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Strategic Alignment to Government Policy: Key for High Level Support

Vietnam eGov Policy

Geospatial (NSDI) is an integrator for the key registers

Cadastre is 1 of 6 key registers

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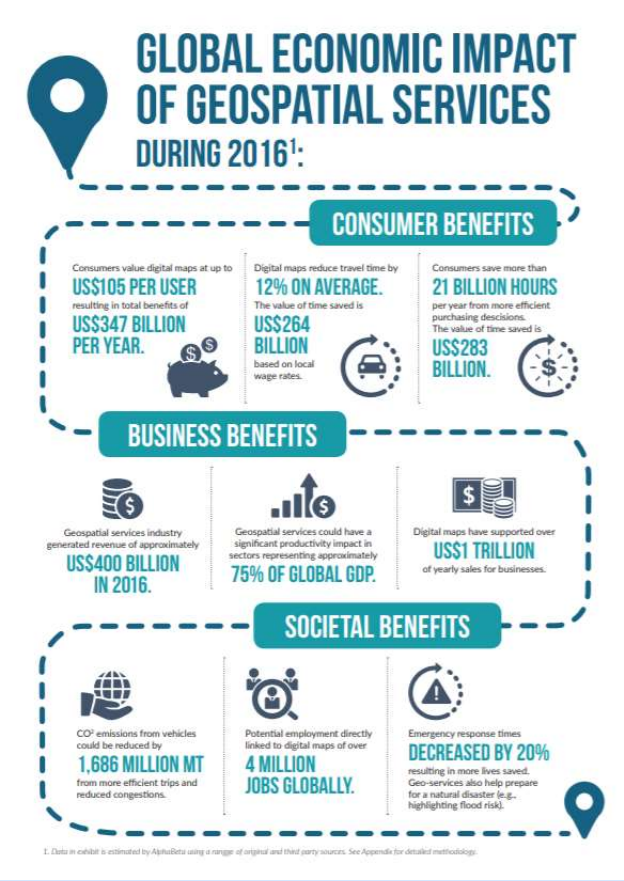
Socio-Economic Benefits Analysis: The Value of Geospatial Information and Investment



https://www.alphabeta.com/wp-content/uploads/2017/09/GeoSpatial-Report_Sept-2017.pdf

Studies which calculate the value of geospatial information and investment show significant benefits but are **mostly from developed countries**

The World Bank team has focused on the **value of geospatial information management in low/middle income countries:**

- Prepared socio-economic benefits analyses and RoI calculation for Action Plans in Albania, Guyana, and the Municipality of Tirana, Albania; analysis is underway in Mongolia and Vietnam;

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Action Plan: Priority Interventions and Investments

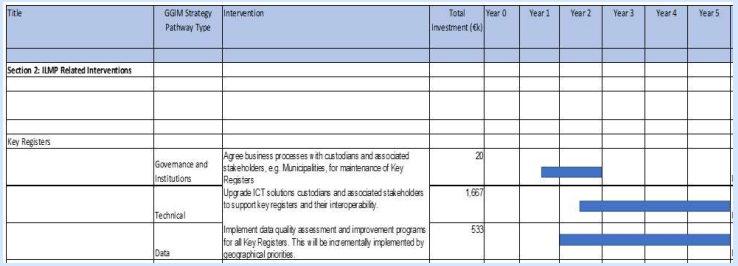
Example from Colombia IGIF Action Plan

Task Type					Financial			Time Frame				
Ref		IGIF Pathway	Priority	Description	Total Investment (US$)	Capital or Recurrent	Funding Source	Year 1	Year 2	Year 3	Year 4	Year 5
		Financial										
3.1	Create an NSDI Business Model		Med		35,000	C	WB					
4.1	Create inventory of existing data	Data	High	See also overlap with 6.3	30,000	C	WB					
4.2	Train and Guide data owners to complete metadata		High		50,000	C	Gov					
4.3	Define fundamental dataset & custodians		High	Consultancy advised	50,000	C	Gov					
4.4	Invest in data themes, prioritised to demand		High	Depending on theme and demand								
	Cadastral Parcels - MPC		High	MPC Subcomponent 3.2	19,500,00	C	WB					
	Functional Areas		High	Consultancy advised	500,000	C and R						
	BaseMap		High	Consultancy advised	500,000	C and R						
	Address Database		Med	Consultancy advised	500,000	C and R						
	Security / Safety		High	Consultancy advised	50,000	C and R						
4.5	Create digital archive of historical data and imagery		Low	Could be a PPP	500,000	C and R						
		Innovation										
5.1	Ensure real time GNSS corrections are available		High	System testing	20,000	C						
5.2	Evaluate imagery for updated topographic base maps		High		20,000	C						
5.3	Develop a Geospatial Centre of Excellence (CoE)		Med	Assumes Head, 2 x trainers	250,000	C and R						
5.4	Assess Geospatial Innovation start-up scheme		Med		20,000	C						
5.5	Improve access to key registers	Demonstrator	Med		50,000	C						

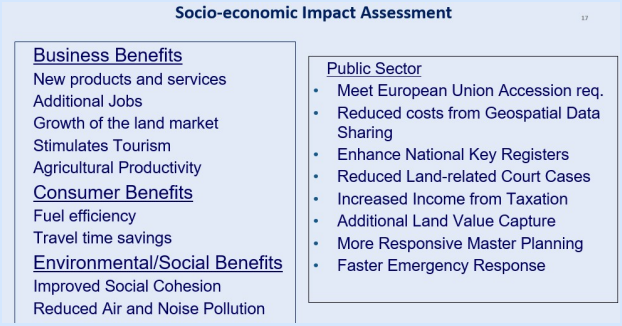
Prioritize Activities in Existing Projects

Action Plan Facilitates Parallel or Co-financing opportunities

Albania example: Integrated Land Management Program and Investment Plan: adopted by Prime Minsters Office



Title	GGIM Strategy Pathway Type	Intervention	Total Investment (€k)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Section 2: ILMP Related Interventions									
Key Registers									
	Governance and Institutions	Agree business processes with custodians and associated stakeholders, e.g. Municipalities, for maintenance of Key Registers	20						
	Technical	Upgrade ICT solutions custodians and associated stakeholdes to support key registers and their interoperability.	1,667						
	Data	Implement data quality assessment and improvement programs for all Key Registers. This will be incrementally implemented by geographical priorities.	533						



Return on Investment (RoI) 3:1

Financial Model: project life cycle of 12 years

- **5 year implementation + 7 year use**
- **Based on 12% discount rate**

	Activity	Costs (€M)
1.	National Land Policy & Property Rights Strategy	0.6
2.	Revise Geospatial Information Strategy & Geodetic Infrastructure	1.1
3.	Land Market	
3.1	Establish National Cadastral Authority	12.0
3.2	National Cadastral Authority ICT Infrastructure	4.4
3.3	National Cadastral Authority First Registration Completion & Data Quality Improvement	47.4
3.4	Establish Key Registers (excluding cadastral parcels)	28.4
3.5	Other Land Market Interventions	16.7
4.	Tourism	2.3
5.	State Land Management	8.3
6.	Agriculture (complete land allocation and registration)	4.4
	TOTAL COSTS	€123.90

Multi-Donor Investment based on Action Plan:

- **Albania Government**: € 6 million agency annual revenue
- **Norwegian Government**: € 3 million for geospatial agency
- **Swedish Government**: € 2 million for valuation
- **European Union**: € 15 million for new cadastral mapping
- **World Bank:** ?? for capital investments (under discussion)

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IGIF eLearning Program: end 2019

Face to Face Learning

- Support to **6 countries and WB Task Teams**
- Linked to lending operations for financing and capacity building

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Evolving Role of Land Administration

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Guiding principles: Voluntary Guidelines (VGGT) on the Responsible Governance of Tenure of Land, Fisheries and Forests

Guiding principles of responsible tenure: legal recognition, allocation and transfer of tenure rights and responsibilities.

Implementation encouraged:

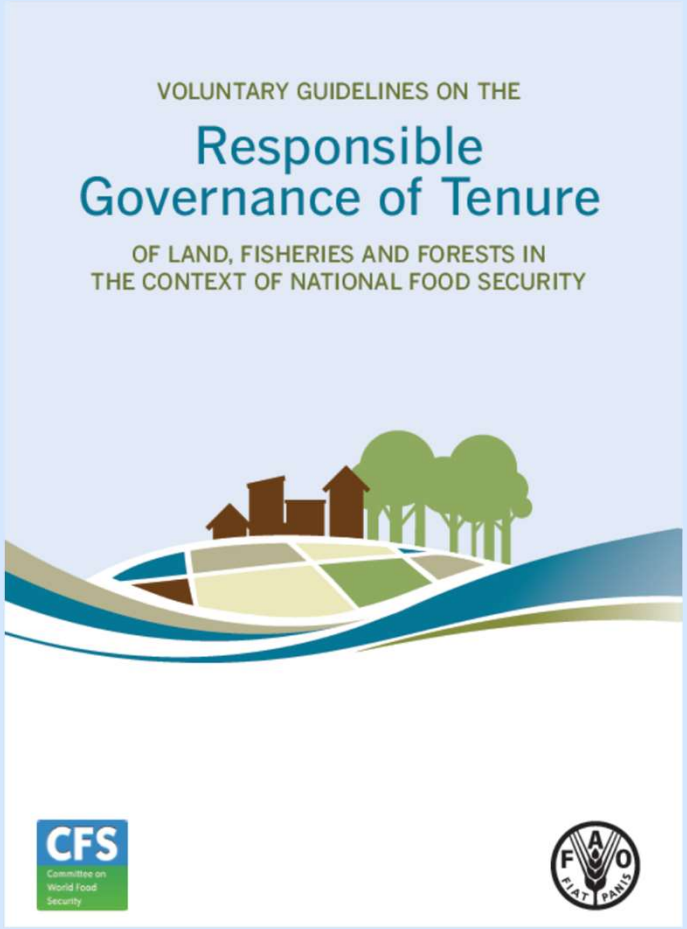
G8, G20, Rio+20, UN General Assembly, World Bank

Major Civil Society activities on governance of tenure:

Oxfam 'Behind the Brands'

High profile private sector endorsements:

CocaCola Corp; PepsiCo

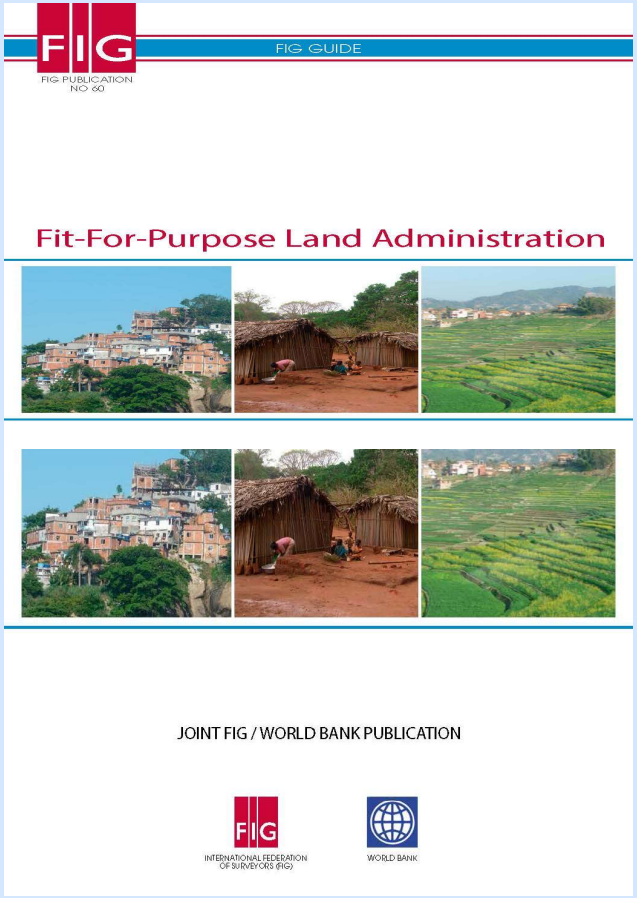


Implementation : Fit-For-Purpose Land Administration

- Approx. 75 percent of the world's population do not have access to formal systems to register and safeguard their land rights.
- Foreign investors through large scale land acquisitions have attained more than 30 million hectares of land in largely poor and middle-income countries since 2000.

A fit-for-purpose approach includes the following elements:

- **Flexible**
- **Inclusive**
- **Participatory**
- **Affordable**
- **Reliable**
- **Attainable**
- **Upgradeable**



Land Administration is the Foundation for Geospatial Information Management

What is our storyline?

Where is the evidence?

Traditional Uses of Geospatial Information

Land Administration

Forestry Management

Urban Planning

Waterways Management

Images sourced from Wikipedia

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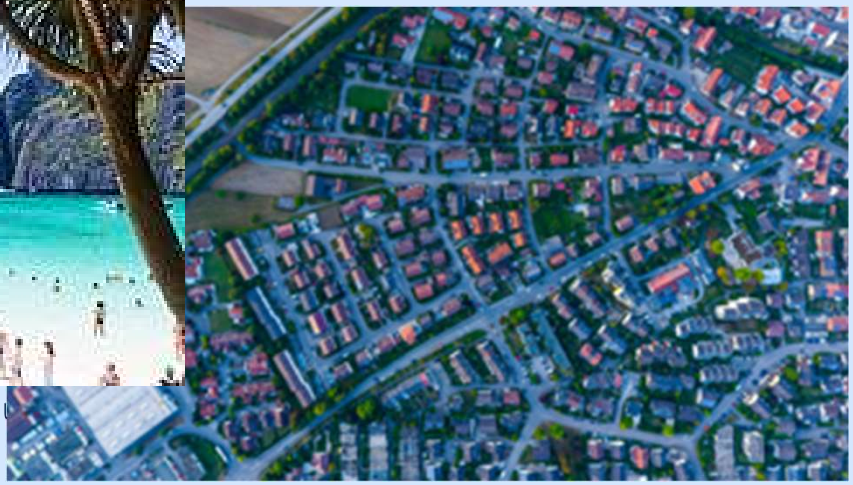
Geospatial Information today can be used for so much more…..

Real Estate Apps

Image source: UN-GGIM website

Tourism

Image source:



Smart Cities

Image source: World Bank website

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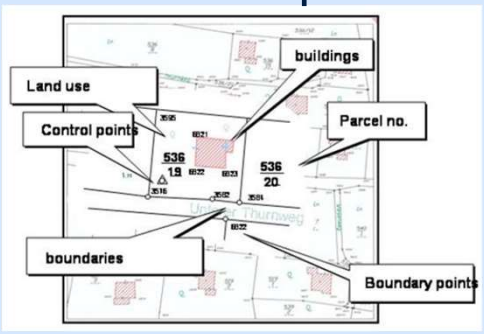
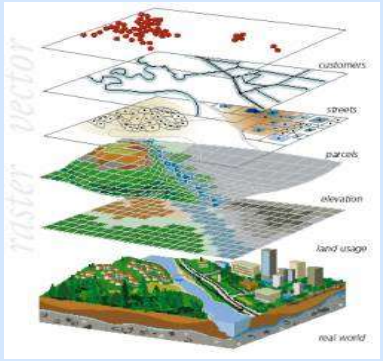
Paradigm Shift

Flat maps



Multi-dimensions



Real Time Integrated Information: Digital Twin

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Storyline: Cadastre/Land Registry is Basis for 4th Industrial Revolution Applications

Seoul Smart City: 5G launched and 50,000 IoT Sensors Installed to Collect Urban Data

"Digital cadastre is the basis for Smart City development…" quote from Seoul City Gov't official

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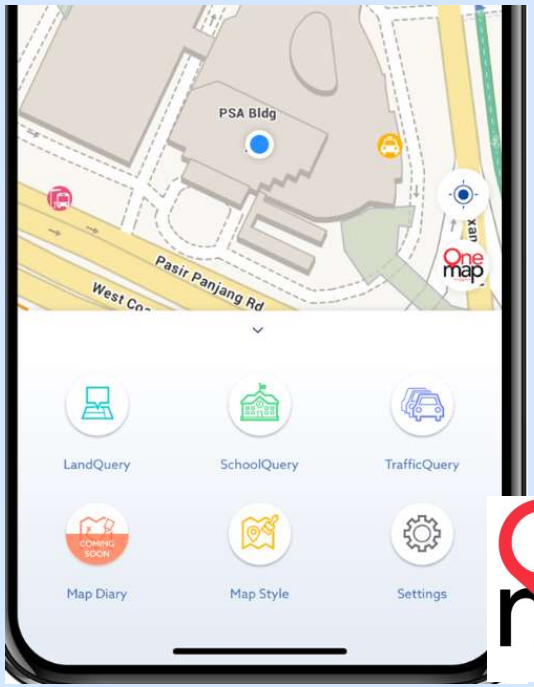
IGIF: Communications, Engagement and Partnerships

"New OneMap is the **authoritative national map of Singapore** with the most detailed and timely updated information developed by the **Singapore Land Authority.**
www.onemap.sg



OneMap Singapore

Partner Agencies

ACRA Accounting And Corporate Regulatory Authority
Agency for Science, Technology and Research
AGD
Building and Construction Authority
CAAS Civil Aviation Authority of Singapore
Committee for Private Education Singapore cpe
DSTA Defence Science & Technology Agency
ECDA Early Childhood Development Agency
GOVTECH Singapore
HOUSING & DEVELOPMENT BOARD
Hotels Licensing Board
HSA Health Sciences Authority
Health Promotion Board
INFOCOMM MEDIA DEVELOPMENT AUTHORITY
jtc Breaking New Ground
Land Transport Authority We Keep Your World Moving
MAS
Ministry of Home Affairs

Evidence: Socio-Economic Benefits and Impact Assessment

Business Benefits

New products and services

Additional Jobs

Growth of the land market

Stimulates Tourism

Agricultural Productivity

Environmental/Social Benefits

Improved Social Cohesion-
Reduced Land-related Court Cases

Consumer Benefits

Fuel efficiency

Travel time savings

Public Sector

- Reduced Geo Data Sharing costs
- Enhance National Key Registers
- Increased Income from Taxation
- Additional Land Value Capture
- More Responsive Master Planning
- Faster Emergency Response

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What is our storyline? Where is the evidence?

Your Input is Needed!


Thank you!
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Tirana, Albania
December 2013