The role of geospatial information management to ensure tenure security in disaster scenarios

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UNECE Working Party on Land Administration
Workshop "Ensuring tenure security after natural and man-made disasters"
Colegio de Registradores, Madrid, Spain, 02-03 November 2023

Round Table 1. Geospatial Information and Tenure Security, 02 November 2023, Thursday, 10:00-11:30

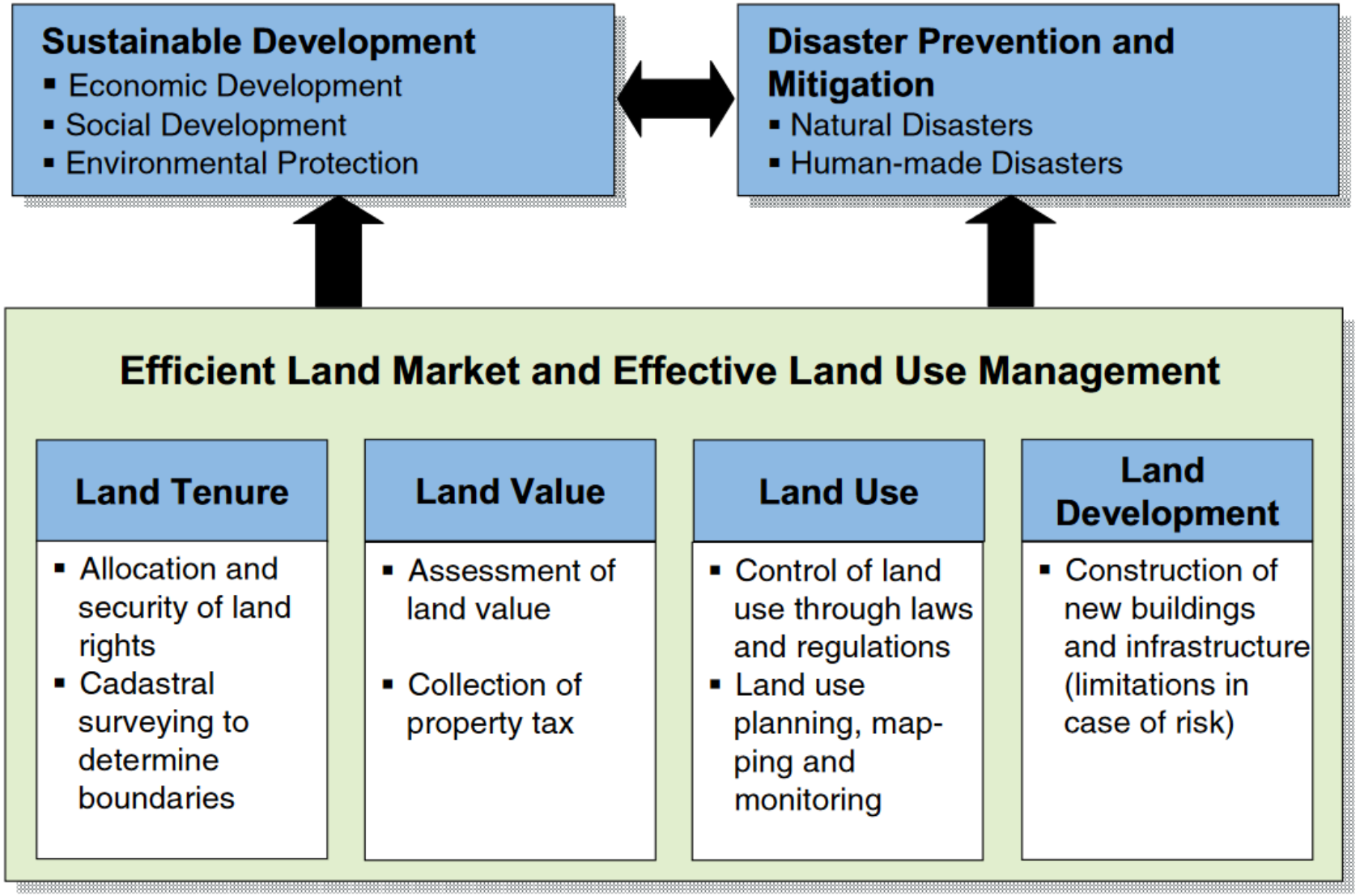
Image By vecstock

An example – land loss in Indonesia due to inundation

Figure 2. Change of coastal line in the coastline of Kabupaten Demak, overlaid with land use map year 2000.
Source: data processing

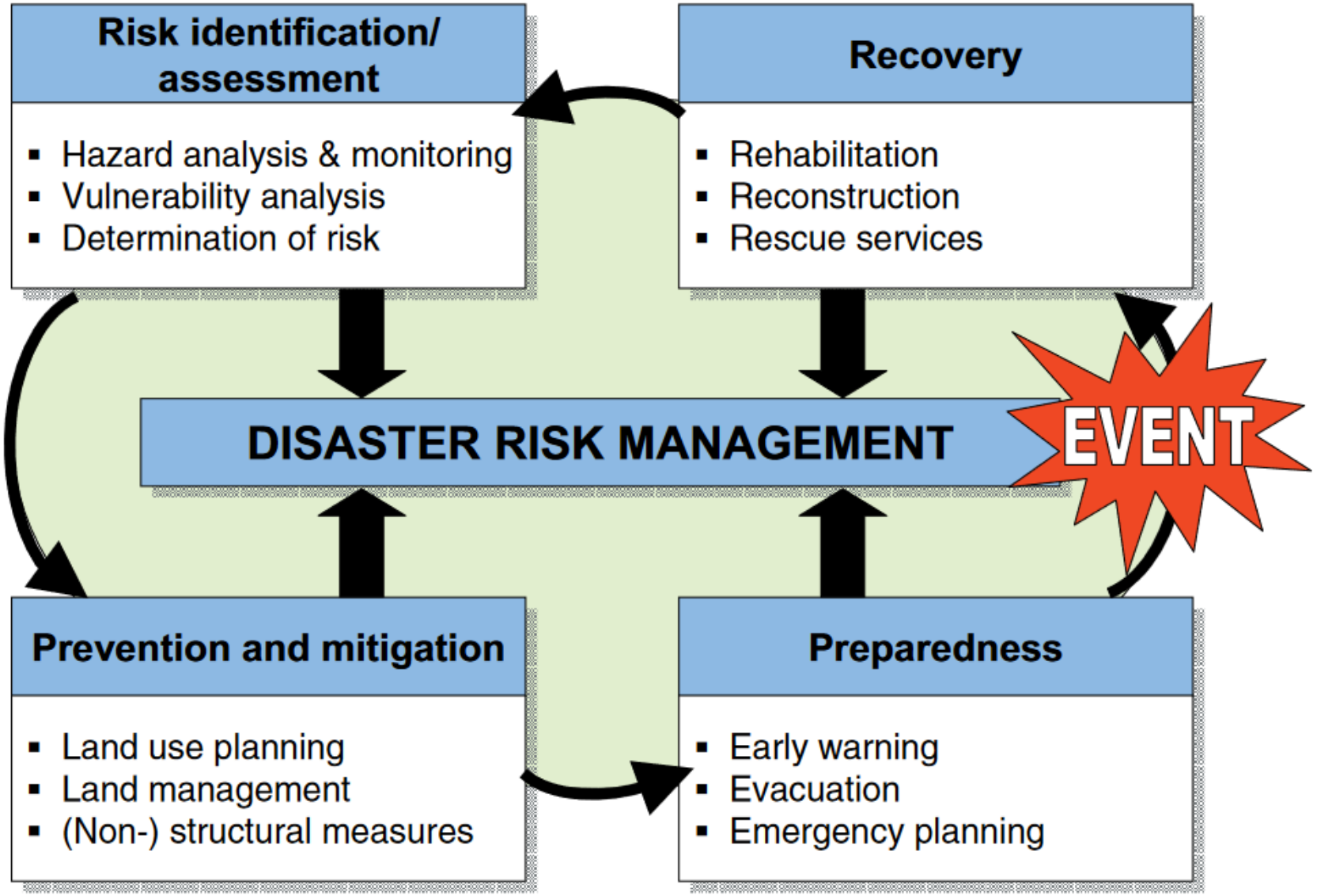
Pinuji, S., & de Vries , W. T. (2023). Evaluating How Tenure Security in Disaster Management Depends on Land Governance Based on Indonesian Case Study. *BHUMI: Jurnal Agraria Dan Pertanahan*, *9*(1), 1–30. https://doi.org/10.31292/bhumi.v9i1.619

Land administration in support of disaster prevention and mitigation



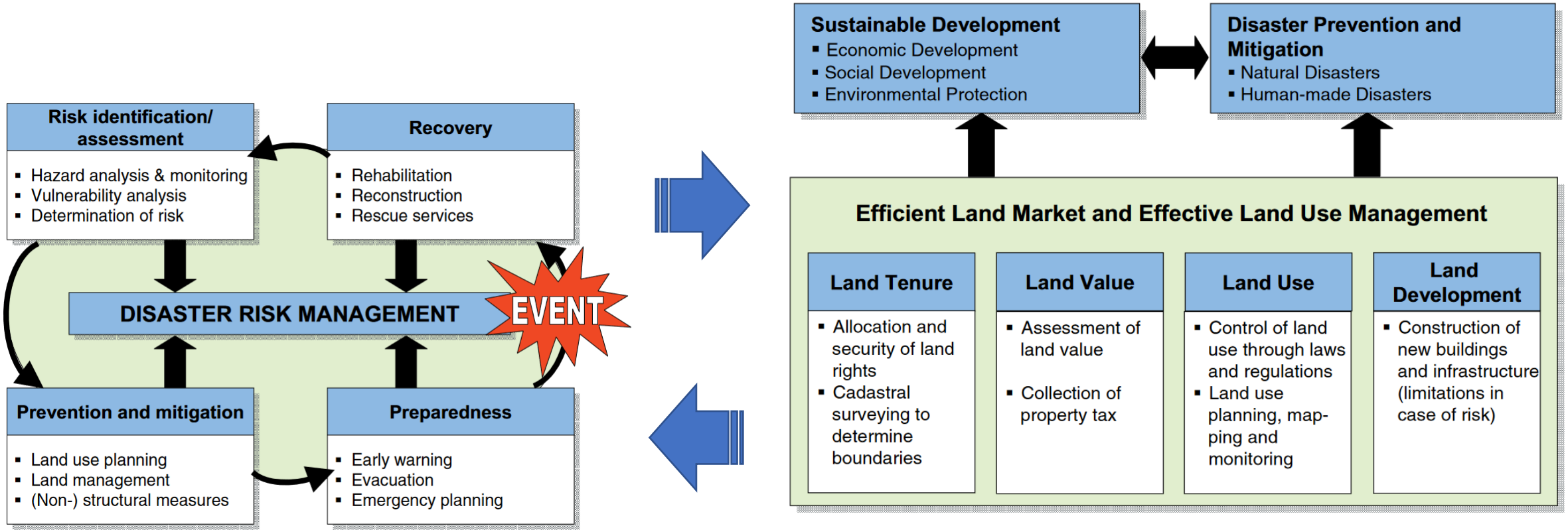
https://www.fig.net/resources/publications/figpub/pub38/pub38_screen.pdf

Key elements of disaster risk management



https://www.fig.net/resources/publications/figpub/pub38/pub38_screen.pdf

Land administration tools for disaster risk management



Geospatial information for disaster risk management

- *Land and geospatial information tells*
  *the **what, who, where, how much**, and other key attributes of a property.*

- *Land and geospatial information is key to ensure that land records*
  *are **comprehensive and secure**.*

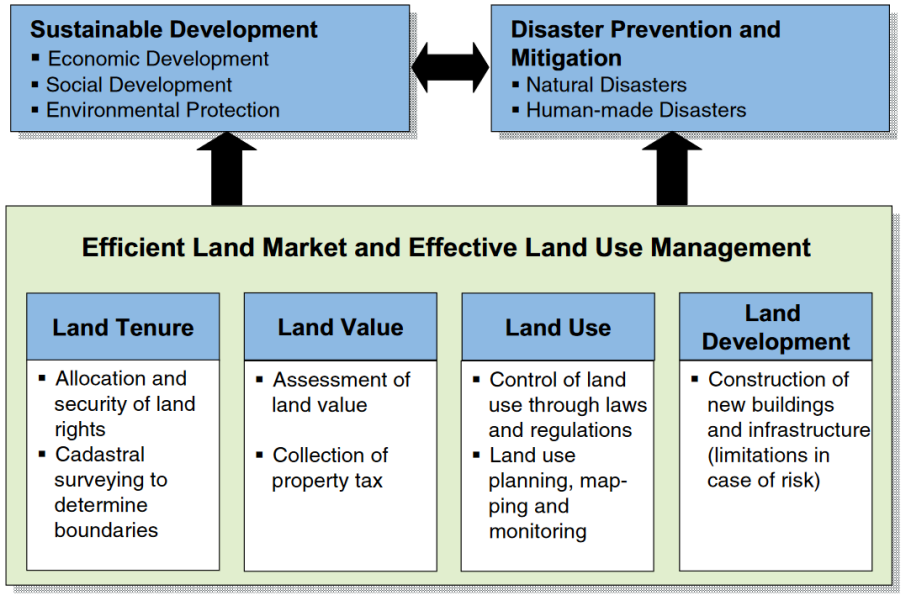
- *Land and geospatial information plays an important role*
  *in **all phases of disaster risk management**:*
  - *disaster prediction,*
  - *prevention,*
  - *preparedness and*
  - *mitigation.*

Anna Wellenstein, Mika-Petteri Torhonen, 2018 https://blogs.worldbank.org/sustainablecities/land-records-and-geospatial-data-are-key-protect-property-rights-build-resilience

Obstacles and shortcomings

Land Tenure

- Allocation and security of land rights
- Cadastral surveying to determine boundaries



Land Value

- Assessment of land value
- Collection of property tax

Land Development

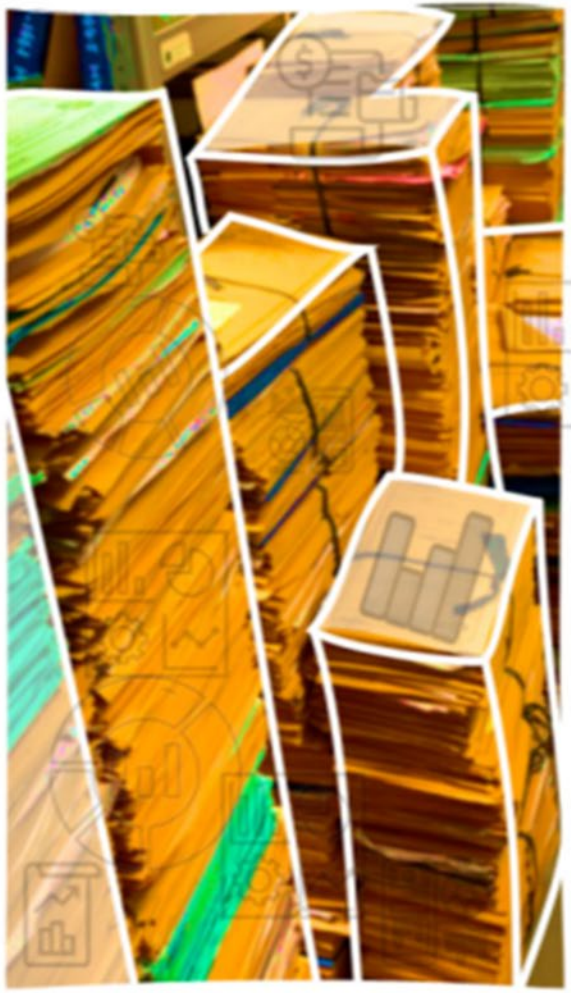
- Construction of new buildings and infrastructure (limitations in case of risk)

Land Use

- Control of land use through laws and regulations
- Land use planning, map-ping and monitoring

Digital Transformation and Land Administration

Sustainable Practices from UNECE Region and Beyond



Digital Transformation and Land Administration

Digital Transformation and Land Administration
Sustainable Practices from UNECE Region and Beyond, *FAO-UNECE-FIG Guide*

Funding Digital Transformation in Land Administration, *FAO-FIG Knowledge for Investment Brief*

Food and Agriculture Organization of the United Nations

UNECE

INTERNATIONAL FEDERATION OF SURVEYORS

UN GGIM‘s overarching Integrated Geospatial Information Framework

The Integrated Geospatial Information Framework provides a basis and guide for developing, integrating and strengthening geospatial information management.

Governance

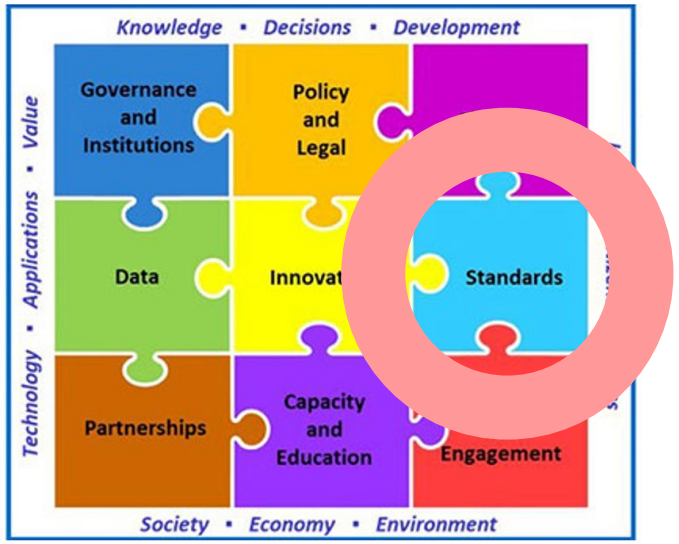
Technology

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.

https://ggim.un.org/IGIF/part1.cshtml

General-purpose IT and geospatial standards



Domain-specific

Geospatial Information and Technology

Organizations: ISO/TC 211, OGC, IHO, DGIWG, WMO, ICAO, etc.
Examples of standards: ISO 19160-1, GroundwaterML, DGIF, S-100

General-purpose

Geospatial Information and Technology

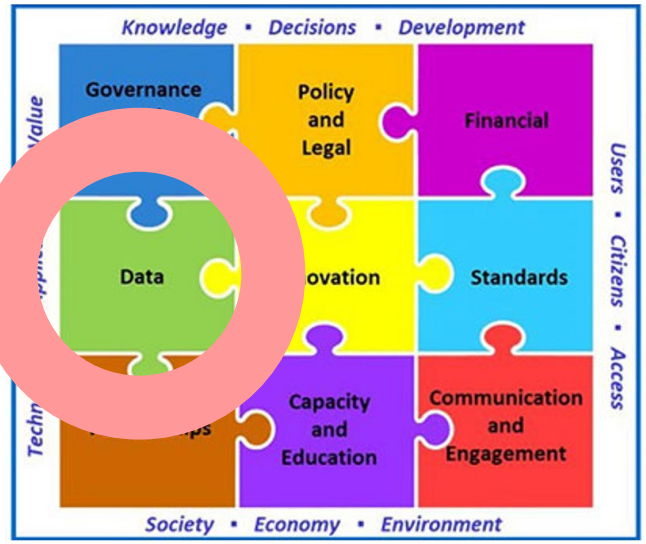
Organizations: ISO/TC 211, OGC, IHO
Examples of standards: ISO 6709, ISO 19103, ISO 19115-1, WMS, WFS

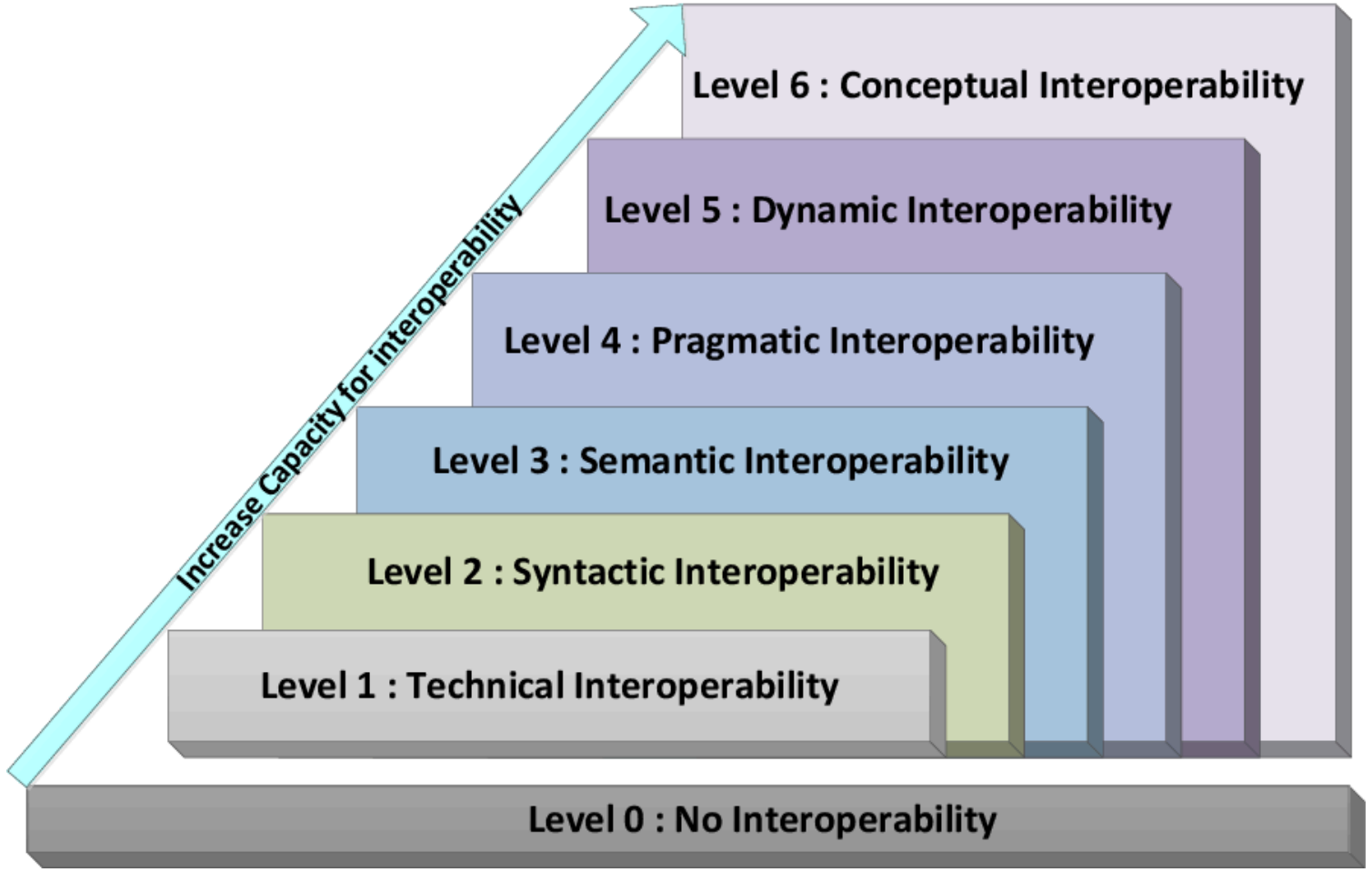
IT, Internet and Information

Organizations: W3C, OASIS, IETF, IEEE, ISO/IEC JTC 1, OMG, etc.
Examples of standards: HTML, XRI, IPv6, IEEE 802, JPEG, UML

https://standards.unggim.ogc.org/unggim_guide.html

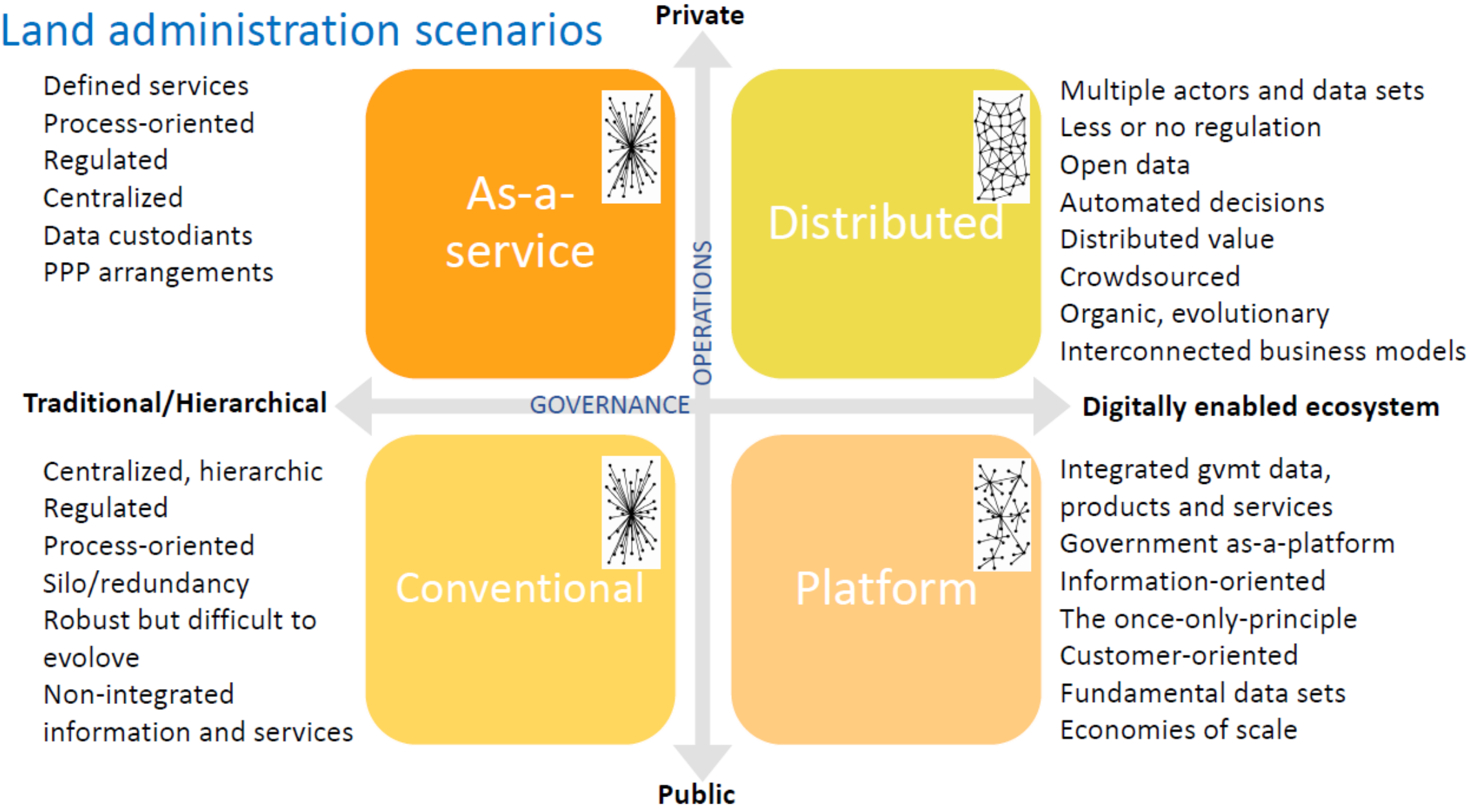
Interoperability of geospatial data



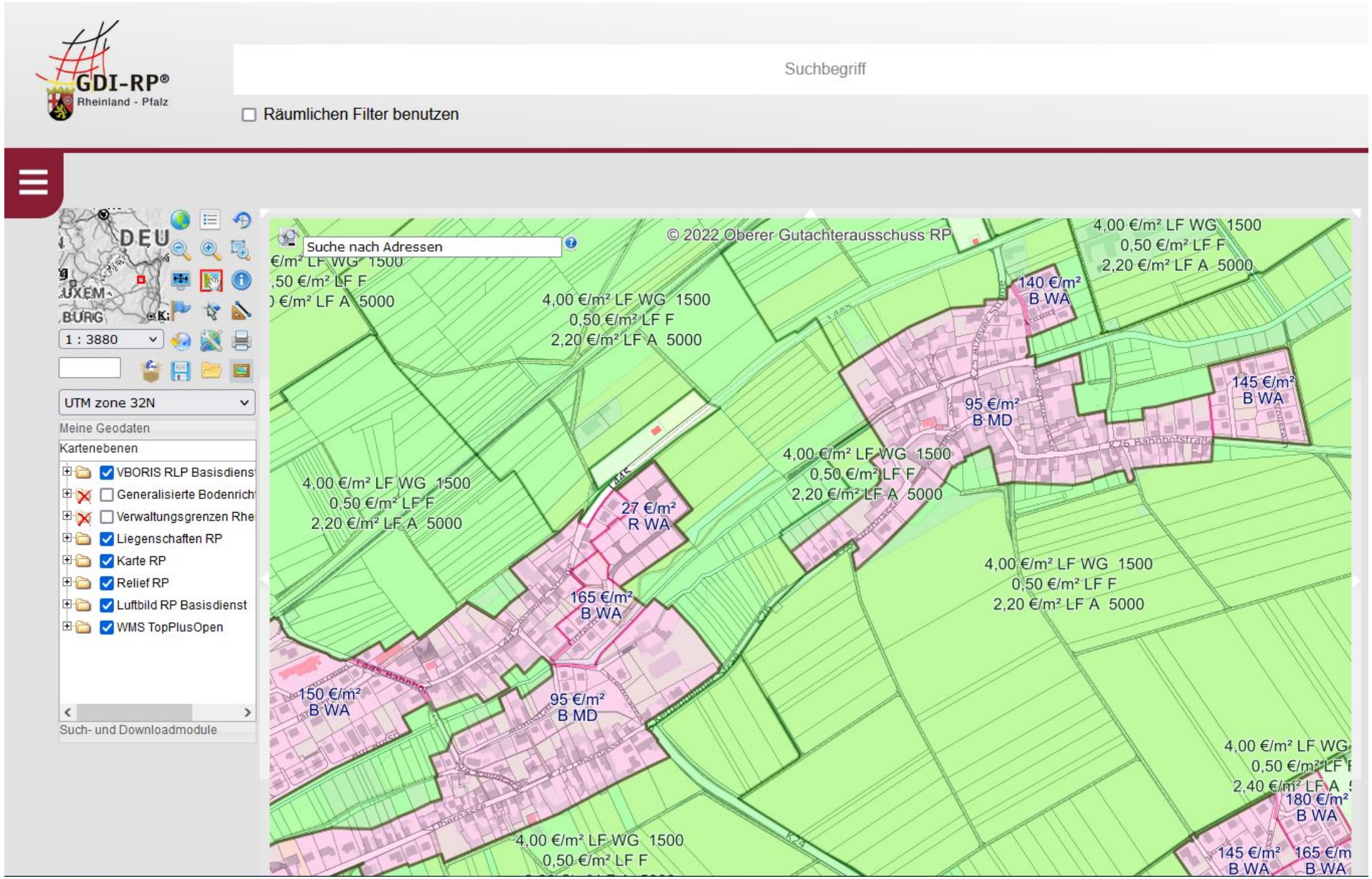


Ajigboye, O.S. (2018). Conceptual framework for Semantic Interoperability in Sensor-enhanced Health Information Systems (SIOp4Se-HIS).

Land administration scenarios

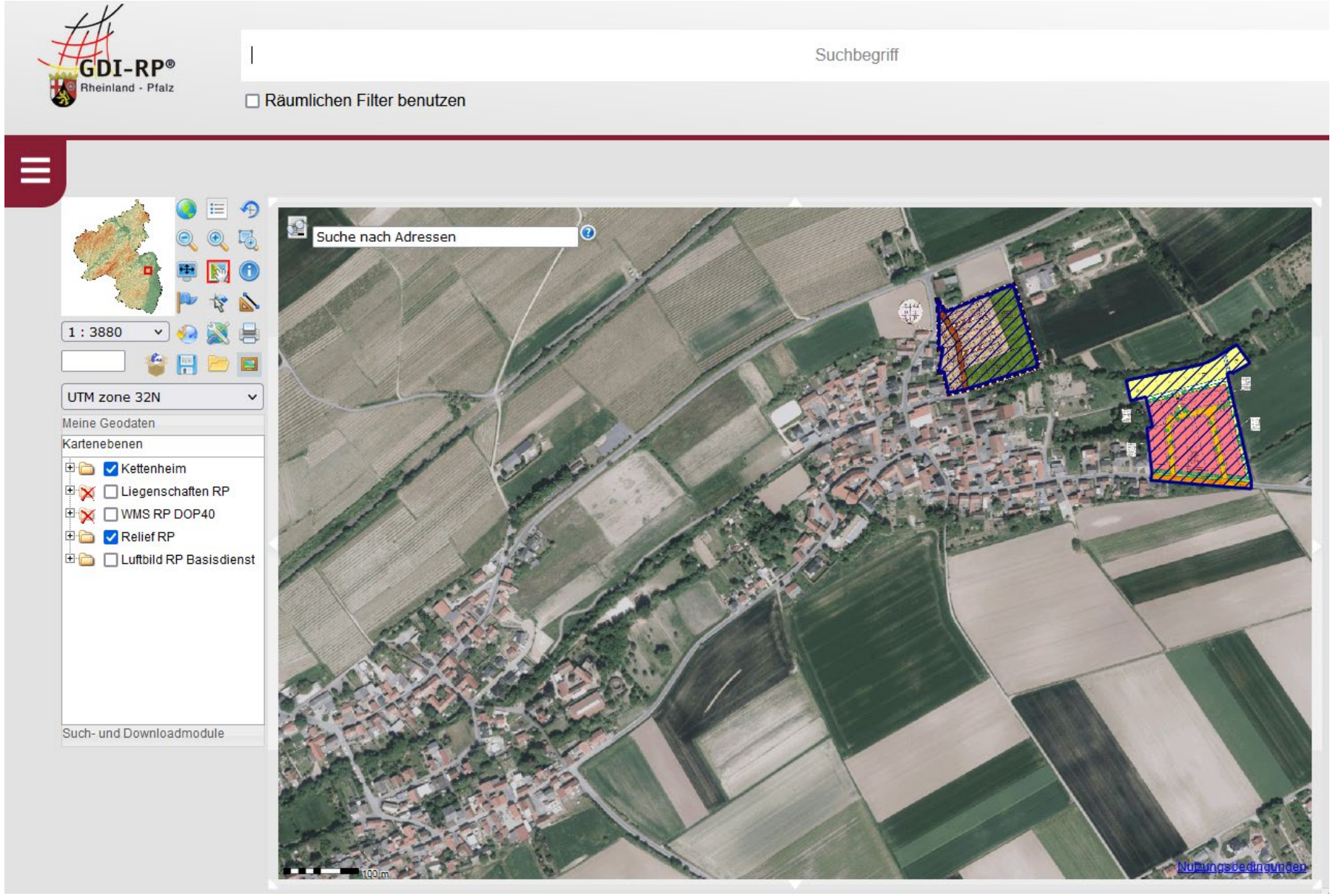


Example 1: Integrated government data



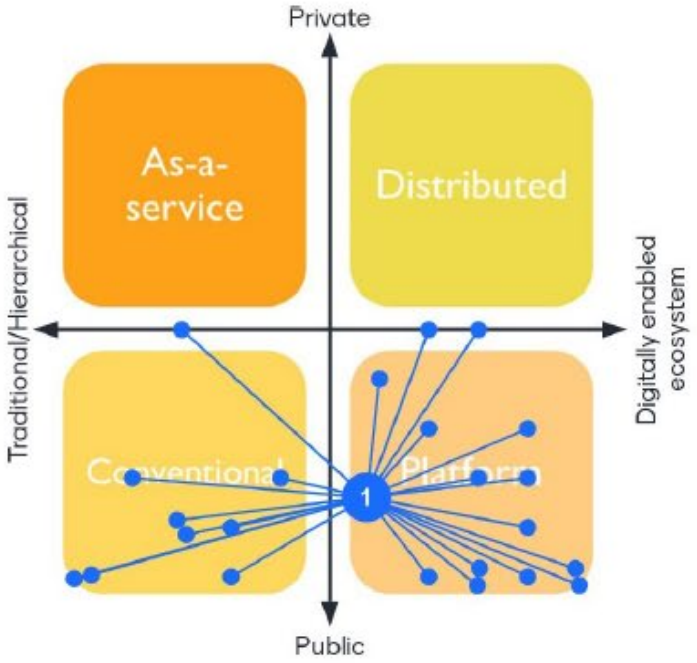
- Land use
- Land parcels
- Land value

Example 2: Integrated government data

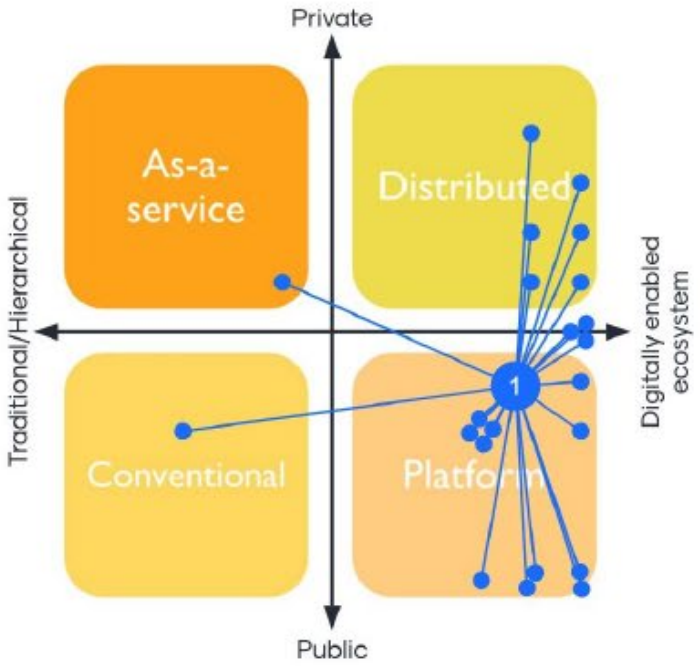


- Current Land use
- Planned Land use

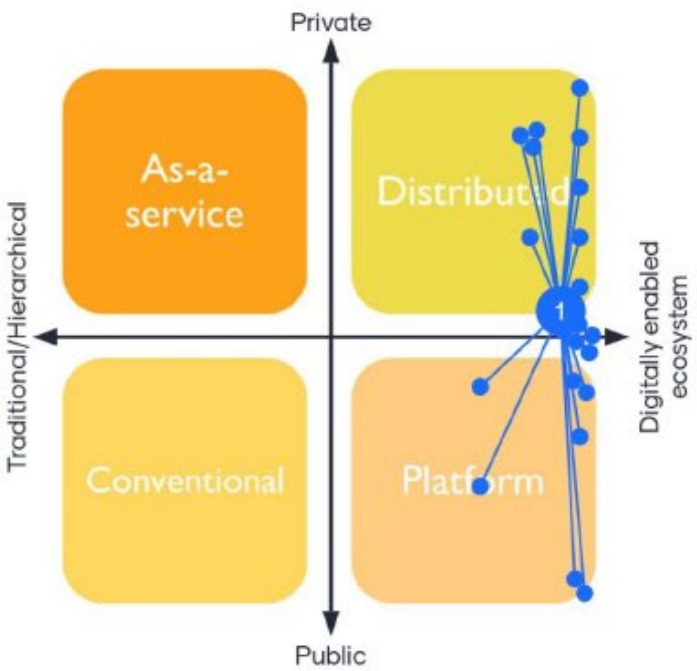
Interactive poll (1 June 2021)



TODAY



EXPECTED 2030



DESIRED 2030

Towards the future geospatial ecosystem

- *Drawing on knowledge about natural ecosystems, we define a geospatial ecosystem as a system in which a community of actors (individuals or organizations and increasingly 'intelligent' machines) interacts via the geospatial information and technologies in their environment.*
- *The geospatial ecosystem is coordinated and shaped by a multitude of stakeholders and self-organises through both competition and collaboration.*
- *In this regard the diversity of actors is important: if they do not differ and add value in some fundamental way, they will competitively exclude each other.*
- *The geospatial ecosystem provides a variety of goods and services on which people depend.*

https://ggim.un.org/meetings/GGIM-committee/11th-Session/documents/~Towards_a_Sustainable_Geospatial_Ecosystem_Beyond_SDIs_Draft_3Aug2021.pdf

Image By freepik

FIG WORKING WEEK 2023

28 May - 1 June 2023 Orlando Florida USA

Protecting Our World, Conquering New Frontiers

FIG Task Force on

Trends and Future Geospatial Information Ecosystem

FIG Director Generals' Forum 2023

Output expected by 2025

Some conclusions

- Geospatial Information GI plays an important role in all phases of disaster risk management
- The lack of open, harmonised and interoperable information models and datasets across land, built environment and natural environments hampers realizing the full GI potential
- UN GGIM‘s IGIF Integrated Geospatial Information Framework provides a methodology for developing and implementing country-level action plans
- The future geospatial information ecosystem is expected to take Geospatial Information Management to the next level

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