

Transforming our world -
The 2030 Agenda for
Sustainable Development



INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK (IGIF)

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 United Nations Statistics Division
 Department of Economic and Social Affairs
 United Nations, New York



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United Nations Secretariat
Global Geospatial Information Management

Positioning geospatial information to address global challenges

ggim.un.org

CONTEXT: GLOBAL DEVELOPMENT

Global Development Frameworks

SUSTAINABLE DEVELOPMENT GOALS



2030 Agenda for Sustainable Development

Sendai Framework for Disaster Risk Reduction 2015-2030

Paris Agreement on Climate Change

SAMOA Pathway for SIDS

Addis Ababa Action Agenda

HABITAT III New Urban Agenda

Our Ocean, Our Future: Call for Action

The transformative nature of the 2030 Agenda requires new and innovative data sources and integration approaches to implement the SDGs and to 'leave no one behind'.

The SDGs are highly dependent on geospatial information and enabling technologies as the primary data and tools for relating people to their location, place and environment, and to measure 'where' progress is, or is not, being made, especially at local levels.



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UN-GGIM Global Geospatial Frameworks

Integrated Geospatial Information Framework (IGIF)

Strategic Framework on Geospatial Information and Services for Disasters

Global Statistical Geospatial Framework (GSGF)

Framework for Effective Land Administration (FELA)

Global Fundamental Geospatial Data Themes

Global Geodetic Reference Frame (GGRF)

National Institutional Arrangements in Geospatial Information Management

Role of Standards in Geospatial Information Management

Compendium on Licensing of Geospatial Information

Statement of Shared Guiding Principles for Geospatial Information Management



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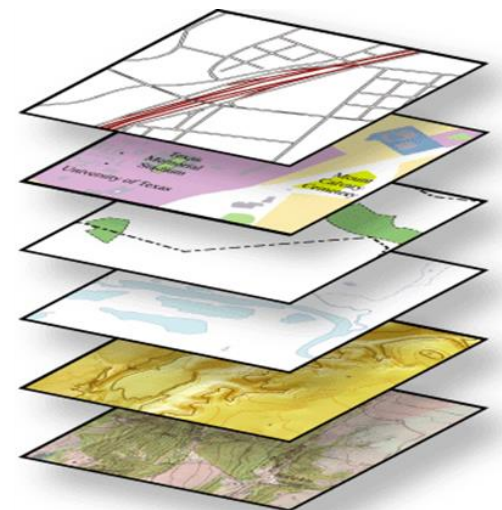
CONTEXT: WHY THE IGIF WAS NEEDED

Geospatial information has emerged as a major contributor to socio-economic transformation in many countries, including e-government, e-service and e-commerce.

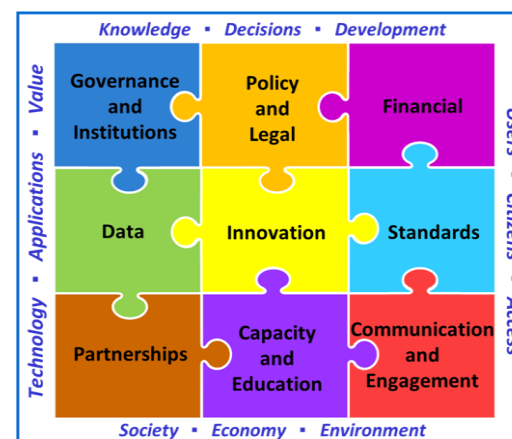
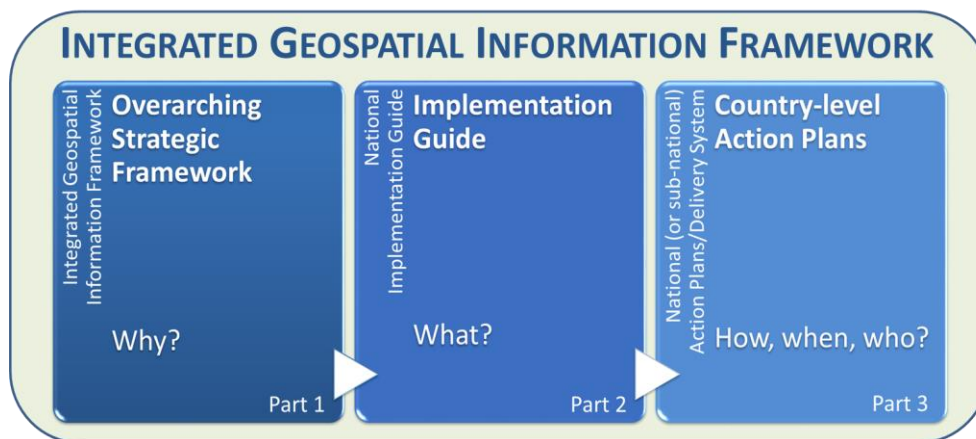
Yet there is still a considerable lack of awareness and understanding of the vital and integrative role of geospatial information and related enabling architectures, such as National Spatial Data Infrastructures (NSDIs), in contributing to local, national, regional, and global development.



There needs to be more institutional collaboration, coordination, interoperability and integration across the various national data information systems and platforms.



Geospatial information is a critical component of the national infrastructure and knowledge economy; a blueprint of what happens where, and the means to integrate a wide variety of government services.



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



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UN General Assembly urges the sharing of geospatial data to benefit People and Planet

26 FEBRUARY, NEW YORK – The science that supports the precise pinpointing of people and places should be shared more widely, according to the United Nations General Assembly as it adopted its first resolution recognizing the importance of a globally-coordinated approach to geodesy – the discipline focused on accurately measuring changes in the shape, rotation and gravitational field of planet Earth.



PHOTO: KYOUNG-SOO EOM

Put forward by Fiji

Co-sponsored by 52 Member States, the resolution was originally put forward by Fiji. Ambassador Peter Thomson, Fiji's Permanent Representative to the United Nations, explained that, as a Small Island Developing State, Fiji is vulnerable to increasingly severe natural disasters, sea-level rise and other problems triggered by climate change, but uses geodetic data to plan as best as it can.

"We fully realize the importance of critical geospatial infrastructure and information in helping countries and decision-makers make more informed, evidence-based decisions on mitigation and preparedness", Ambassador Thomson stated.

NEW YORK: Ambassador Peter Thomson from Fiji introducing the resolution to the UN General Assembly.

https://ggim.un.org/documents/A_RES_69_266_E.pdf

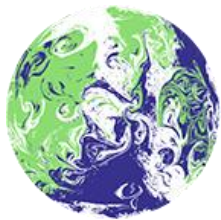


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**UN CLIMATE
CHANGE
CONFERENCE
UK 2021**

IN PARTNERSHIP WITH ITALY



**Science, Solutions, Solidarity
For a livable future**

FAST FACTS ABOUT SIDS (AVERAGES)



26.2%

LAND AREA LESS THAN
5 METERS ABOVE
SEA LEVEL



29.3%

POPULATION LIVING
AT LESS THAN 5 METERS
ABOVE SEA LEVEL



24,111 km²
LAND AREA



666,110 km²
EXCLUSIVE ECONOMIC
ZONES



96.5%
OF AREA IS OCEAN



3.5%
OF AREA IS LAND

'We are sinking': Tuvalu minister gives Cop26 speech standing in water to highlight sea level rise



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A TIME FOR ACTION...

The role of NMGAs at COP26

To support the UN goals at COP26, national mapping and geospatial agencies (NMGAs) can support their country by enabling:

1. Collaboration across borders - we can enable all countries regardless of economic or political differences, to tackle common issues.
2. Collect and curate authoritative data - we help plan and deliver measures that can be trusted and relied upon by policy-makers and the international community.
3. Make foundational data accessible and reusable - we encourage others to expand on our work to tackle specific problems in innovative ways.
4. Sponsor and embrace agreed standards - we ensure technical solutions can tackle common problems in a consistent way.



<https://www.ordnancesurvey.co.uk/documents/cambridge-conference/statement-paper-climate-challenges.pdf>



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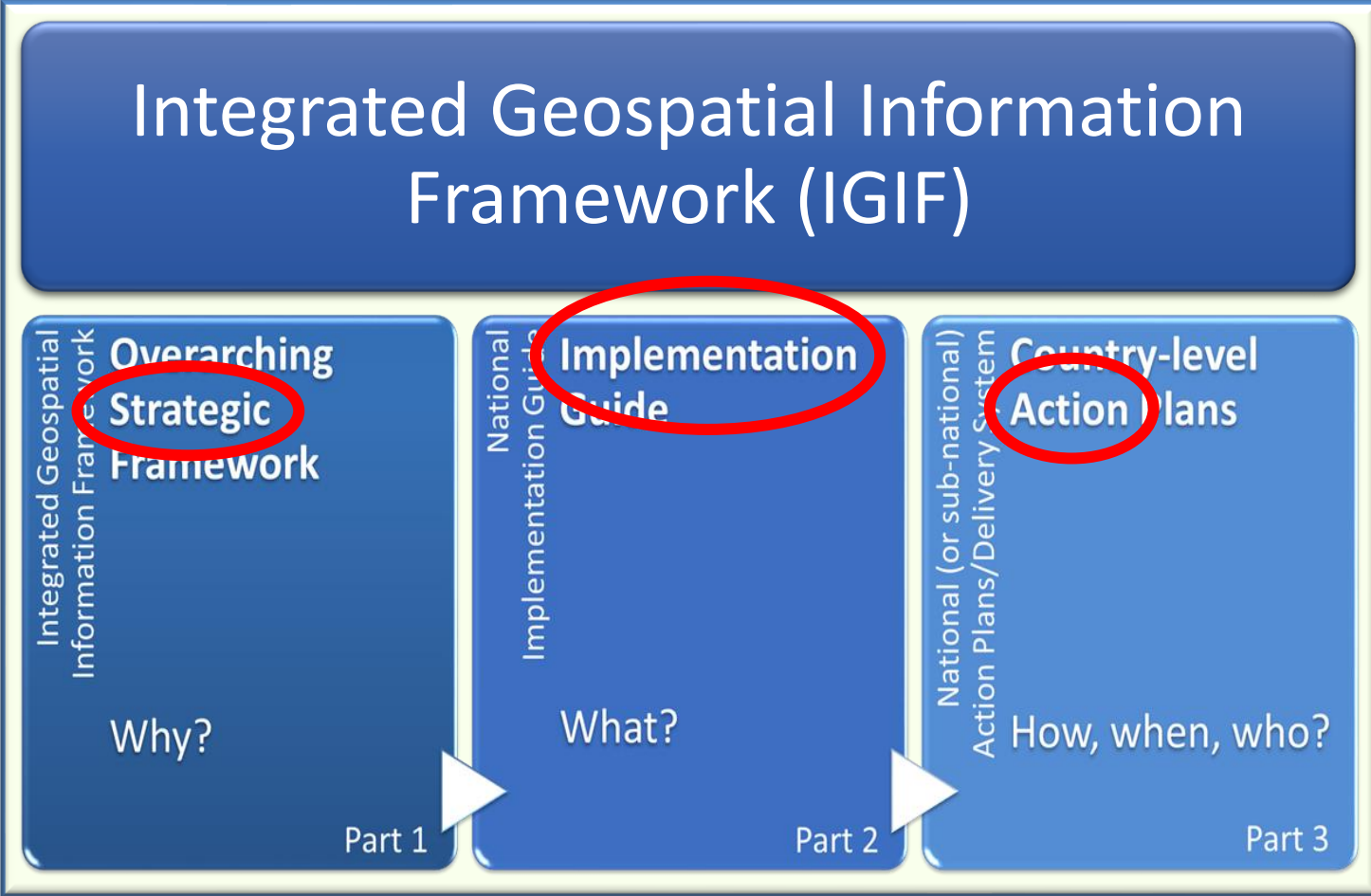
Positioning geospatial information to address global challenges

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UN-GGIM Global Geospatial Frameworks

The IGIF is a multi-dimensional Framework that is aimed at strengthening national geospatial information management in countries, developing countries in particular. It comprises an overarching **Strategy** - from local to global, **Implementation** guidance, and **Action** plans at the country level.

With a focus on the ability for geospatial information to be integrated with any other meaningful data to solve societal and environmental problems, the IGIF acts as a catalyst for economic growth and opportunity and stimulates improved understanding and decision-making for national development priorities and the SDGs.



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

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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.

STRATEGIC DRIVERS

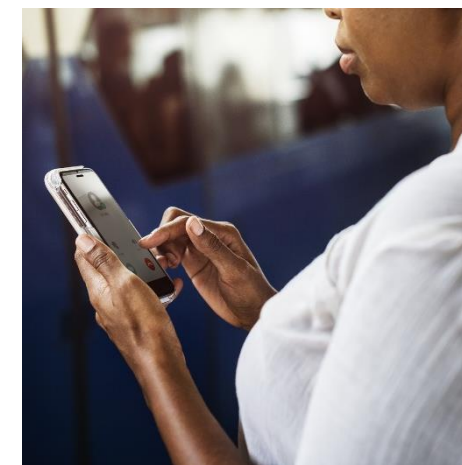
National Development Agenda • National Strategic Priorities • National Transformation Programme • Community Expectations • Multilateral trade agreements • Transforming our World: 2030 Agenda for Sustainable Development • New Urban Agenda • Sendai Framework for Disaster Risk Reduction 2015–2030 • Addis Ababa Action Agenda • Small Island Developing States Accelerated Modalities of Action (SAMOA Pathway) • United Nations Framework Convention on Climate Change (Paris Agreement) • United Nations Ocean Conference: Call for Action

UNDERPINNING PRINCIPLES

Strategic Enablement	Transparent and Accountable	Reliable, Accessible and Easily Used	Collaboration and Cooperation	Integrative Solution	Sustainable and Valued	Leadership and Commitment
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GOALS

Effective Geospatial Information Management	Increased Capacity, Capability and Knowledge Transfer	Integrated Geospatial Information Systems and Services	Economic Return on Investment
Sustainable Education and Training Programs	International Cooperation and Partnerships Leveraged	Enhanced National Engagement and Communication	Enriched Societal Value and Benefits



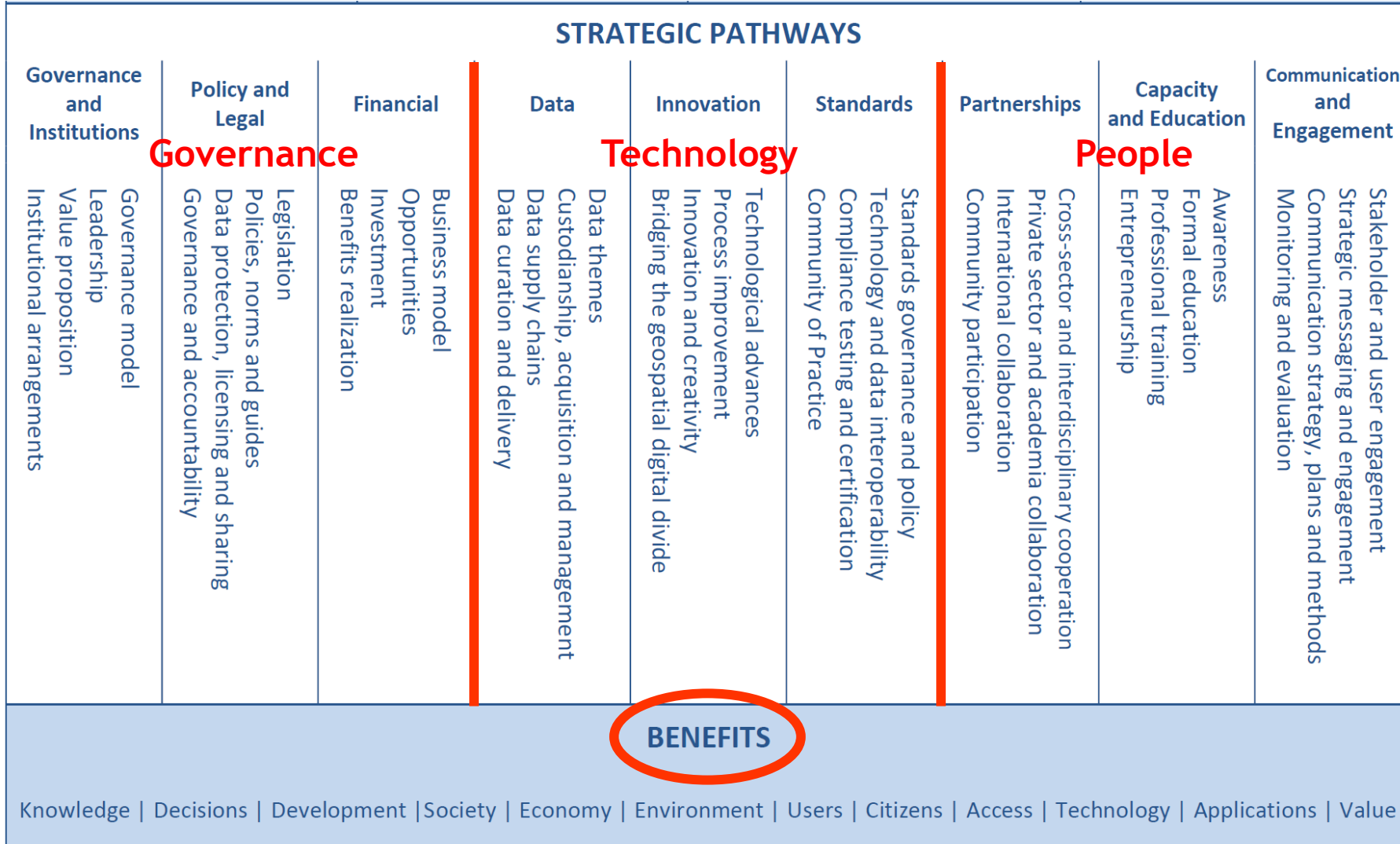
The Framework is an enabler for coordinating, developing, strengthening and promoting the effective sharing of geospatial information for policy formulation, decision-making and innovation.



IGIF: 9 STRATEGIC PATHWAYS



Geospatial information has immense social and economic value. Citizens, communities, business sectors, governments, and many other stakeholders benefit every day.



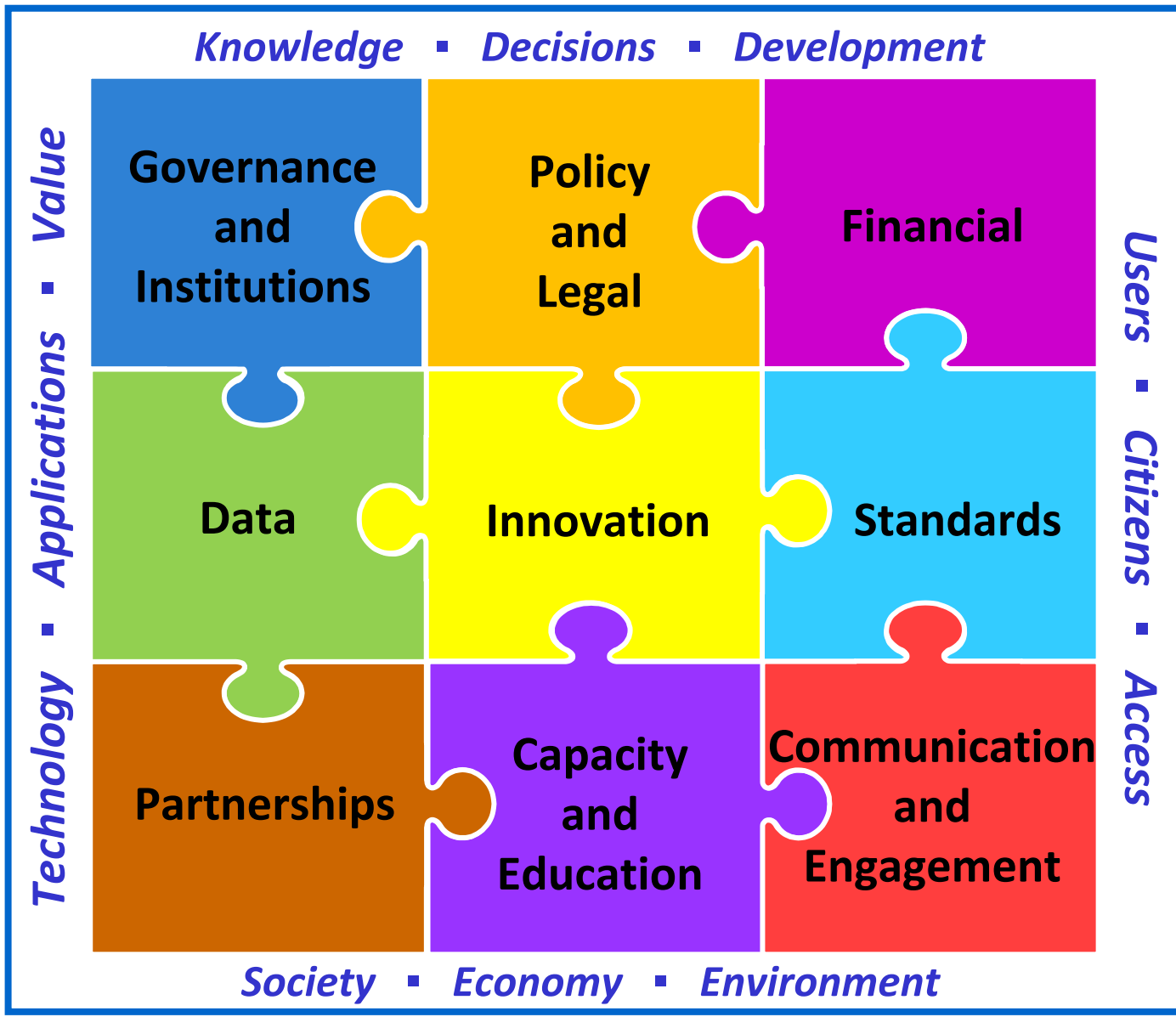
Anchored by 9 Strategic Pathways, the IGIF is a mechanism for articulating and demonstrating national leadership in geospatial information, and the capacity to take positive steps. The Strategic Pathways 'implement' the IGIF through actions.



Governance →

Technology →

People →



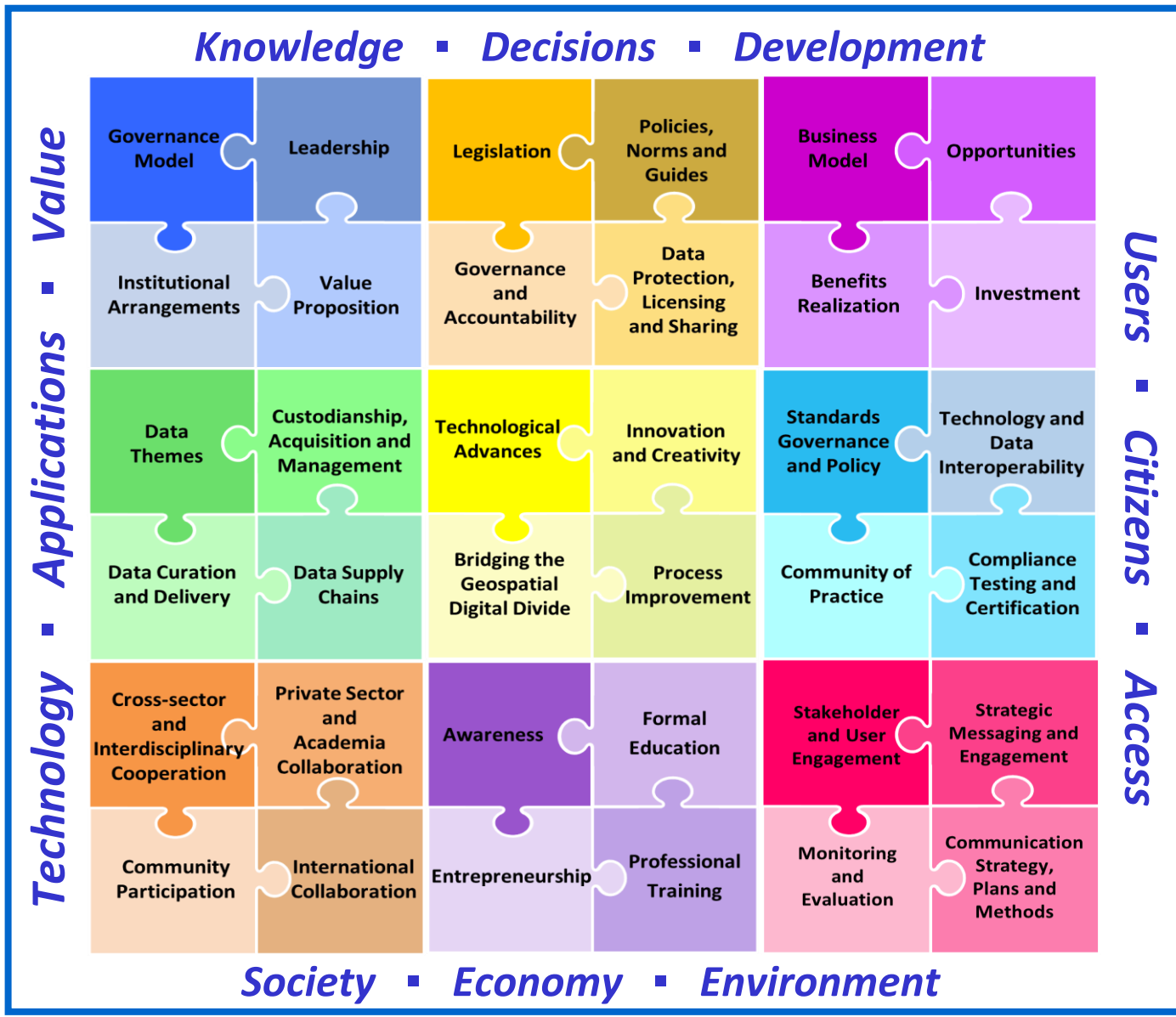
9 Strategic Pathways solve the IGF puzzle



Governance →

Technology →

People →



9 Strategic Pathways solve the IGF puzzle ...with 36 Key Elements



IGIF: BENEFITS

3. Socio-Economic Impact and Benefits: Sectors, Use Cases, Actions

SECTORS	Transport Community Services	Land Mining	Environment Water	Law Tourism	Disaster Management Security	Government Administration	Energy Agriculture	Health Urban Planning
USE CASES	Event Management	Mining Cadastre	Environmental Permitting	Emergency Response COP	Crop Production	Rangeland Monitoring		
Transport Modelling	Traffic Operations	Intelligent Transport Network	Freehold Land Cadastre	Eco-tourism	Crime Mapping	Farm to Table		
Road Safety	Street Works	Census	State Land Cadastre	Business Registration	Energy Sourcing	Location-based Services	Agricultural Land Registry	
Ride-sharing Apps	Parking	Valuation	SmartCities	eGovernment	Community Services	Livestock Management	National Development Plan	
		Earthquake Monitoring	Retail Apps	Real Estate Apps	Disease Monitoring			
ACTIONS/INVESTMENTS								
	Positioning e.g. GNSS Network	Imagery Acquisition e.g. Satellite Imagery	Data Capture e.g. State Land Cadastre	Data Integration e.g. Street Address	Data Sharing Geoportal/Policy	Business Intelligence e.g. AI and Machine-learning Applications		



IGIF: COUNTRY-LEVEL ACTION PLAN (CAP)

National (or sub-national) Action Plans/Delivery System
Country-level Action Plans
 How, when, who?
 Part 3

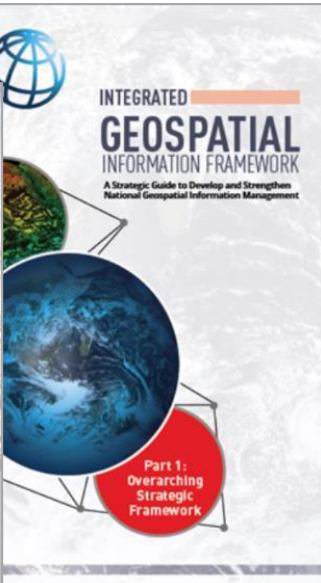
Each Country-level Action Plan is unique, reflecting decisions made to advance and/or enhance national geospatial information arrangements, and where a country wants to be after planning for their IGIF.

Completed Pilots	IGIF Implementation in Progress/Planned (funding support)		
Albania (WB) Palestine (WB) Guyana (FAO) Municipal Level: Tirana, Albania (WB)	Burkina Faso (UNSD) Cambodia (WB) Colombia (WB) Dominican Republic Egypt (WB) Ethiopia (UNSD) Fiji (UNSD) Georgia (Norway) Germany Ghana (WB) Ireland	Italy Kyrgyz Republic (Norway) Lesotho Liberia (WB/Sweden) Moldova (Norway/WB) Mongolia (UNSD/WB) Nepal (UNSD) Netherlands Nicaragua (WB) Philippines (WB) Russia	Saudi Arabia Senegal (WB) Seychelles (WB) Serbia (WB-FAO) Sierra Leone (WB) Sweden Tonga (UNSD) UAE Ukraine (Norway) United Kingdom Vietnam (WB)

Note on Methodology:
 UNSD supports countries remotely through UN tools and on-line engagement.
 FAO, Norway and Sweden are using World Bank tools and provide in-country support.



IGIF IN MONGOLIA



"ОРОН ЗАЙН МЭДЭЭЛЛИЙН НЭГДСЭН МЕНЕЖМЕНТ" ХЭЛЭЛЦҮҮЛЭГ

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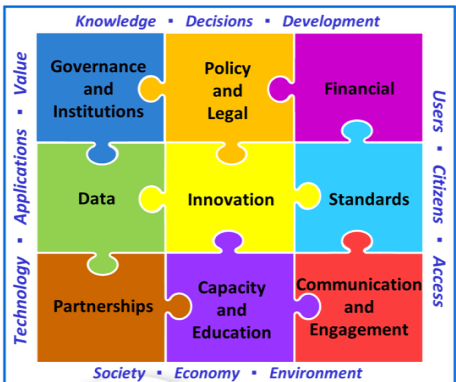
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Холбоо барих: 51-264596



"The UN IGIF implementation guides really helped us to systemize and prioritize the tasks we need to complete our Country-level Action Plan."

Ms. Myagmarjargal Mendbayar
 Agency for Land Administration and Management, Geodesy and Cartography
 Mongolia



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United Nations 11th Tranche Development Account:

- Project 1819D “Strengthening Geospatial Information Management in Developing Countries towards Implementing the 2030 Agenda for Sustainable Development” in Burkina Faso, Ethiopia, Fiji, **Mongolia**, Nepal, Kingdom of

Lifecycle of the project:
 Investment phase: 5 years
 Operational period: 7 years
TOTAL 12 years
Discounted interest: 6% annually

WB Technical Assistance to the Government of Mongolia for Geospatial information Management

- National Spatial Data Infrastructure for Mongolia: **Socio Economic Impact Analysis**
- within the **World Bank Urban, Resilience and Land Global Practice (GPURL), Global Land and Geospatial Unit.**

National Spatial Data Infrastructure for Mongolia:
 Socio Economic Impact Analysis
 Draft Final 31st March 2020



UN-GGIM

United Nations Committee of Experts on Global Geospatial Information Management



National Spatial Data Infrastructure

A Strategy for Geo-driven Digital Transformation and Innovation in Mongolia 2020-2025



World Bank





Strengthening National Spatial Data Infrastructure through implementing the **Integrated Geospatial Information Framework**



1. Overarching Strategic Framework

2. Implementation Guide

3. Action Plan – Mongolia, Geospatial Alignment to Policy Drivers

4. Socio-Economic Impact Analysis
5. Investment Plan

6. Geospatial Alignment to Policy Drivers

7. Geospatial Information Support to COVID-19

8. Sustainable Economic Growth For Mongolia Supported by Geospatial Information

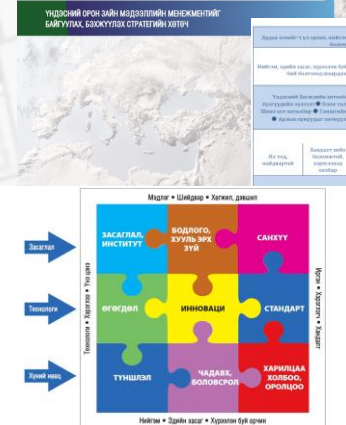
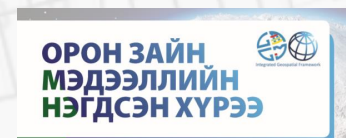
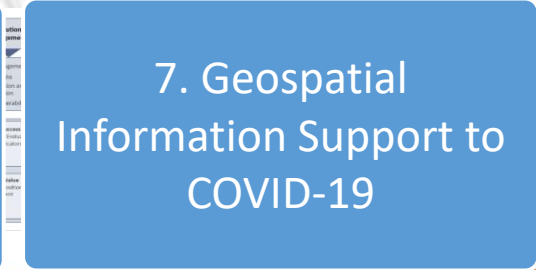


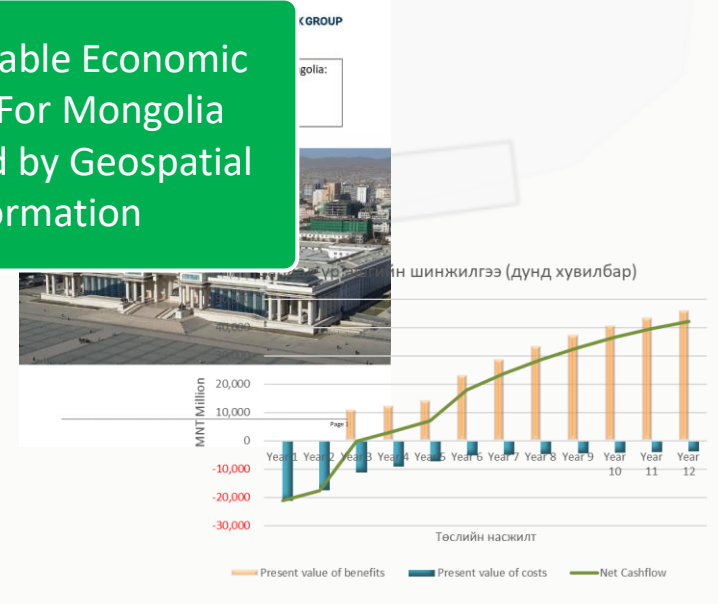
Table with multiple columns and rows, likely a detailed implementation plan or strategic framework document.



Powering Digital Transformation, Innovation and National Sustainable Development through the Efficient and Effective use of Geospatial Information



Table with columns for 'Standards' and 'Communication and Engagement', listing various goals and actions.



Vision and Mission



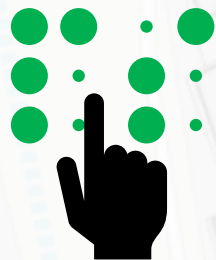
Geo-driven eGovernment and Innovation that empowers efficient and effective use of geospatial information towards national sustainable development.



Strengthen integrated geospatial information management and promote the value of geospatial information through leadership, coordination, partnerships, advanced technology and geo-standards.

Goals

**1. QUALITY
INFORMATION**



**2. ACCESSIBLE
AND USEFUL**

**3. GOOD
GOVERNANCE**



**4. INNOVATION
AND CAPACITY**



Strategic Alignment



Benefits

- ✓ Creating job opportunities
- ✓ Improved public sector efficiency
- ✓ Generating citizen benefits
- ✓ Stimulating private sector investment
- ✓ Saving lives in emergencies
- ✓ Improved adaptation to climate change

Fundamental geospatial data themes



Topographic maps



Cadastral map



Road network



Functional areas



Geodetic network



Land use



Hydrology



Land cover



Geographical names



Elevation and depth



Address



Soil



Buildings and settlements



Demography



Geology



Ortho imagery

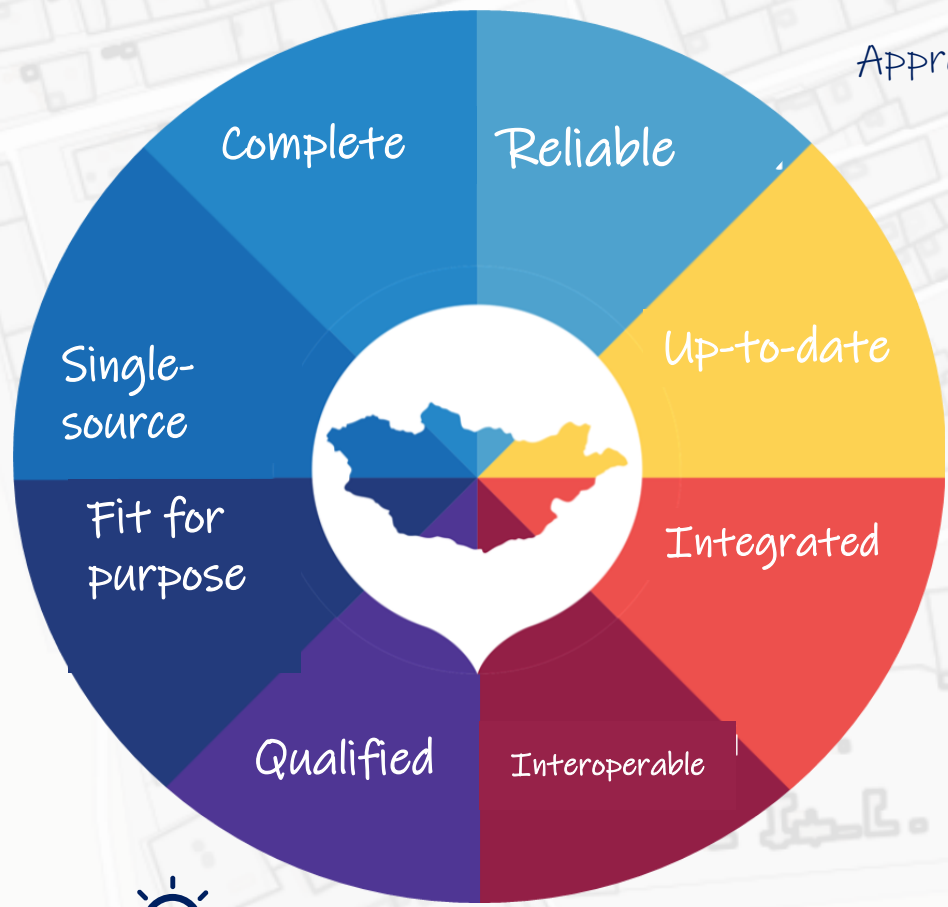


Historical sites and archeology



Infrastructure

NSDI



- Innovation-triggering
- Simplifying decision-making process
- Providing integrated management

Vision-2050

Approved by the Cabinet, Decree 52-2020

2021-2030: 1st phase The period to create a healthy, safe and comfortable living environment through increasing the effectiveness and accessibility of state policy planning and implementation in regard to the land relations, geodesy and cartography.

2031-2040: 2nd phase The period to introduce smart and citizen-centered governance and management system on land with location-based spatial information.

**NSDI Task Force 167, 2019
lead by Prime Minister**

Use Cases of Geospatial Information

30 Actions of NSDI

< 60 Use Cases

01 Improved geospatial data sharing

06 Land market growth

02 Better Disaster Management

07 Enhanced Urban Planning

03 Faster Emergency Despatch

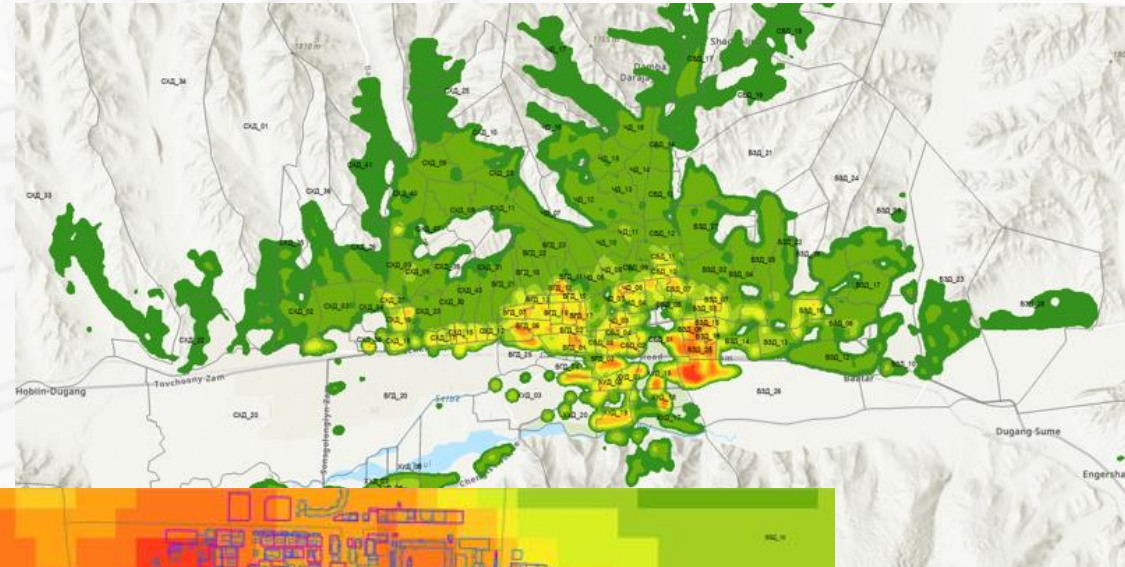
08 New Geospatial products and services

04 Improved collection of Land Use fees and taxes

09 Economic efficiency from Open Geospatial Data

05 Higher Property Tax Revenues

10 Quicker and cheaper land surveys



Being Strategic!!!

Powering Digital Transformation, innovation and national sustainable development through the efficient and effective use of geospatial information.



National Spatial Data Infrastructure

A Strategy for Geo-driven Digital Transformation and Innovation in Mongolia
2020-2025



Mongolia is taking a huge leap forward in land management, land use registration, urban planning, and transportation management by adopting digital maps and satellite images (referred to as geospatial information) to enable improved decision-making for the betterment of the community.



Geospatial information is of vital importance. Every decision we make, every event or activity we do in our daily lives occurs at a geographic location. Whether we are determining the best site for a new hospital, choosing the location for a new business venture, staging a community event or responding to an emergency – geospatial information is critical to our decision-making.

While government, businesses and research institutions collect, manage and analyse geospatial data, this information is often not easily accessed. This strategy delivers a new paradigm where our geospatial information assets are able to be accessed, shared, analysed and applied through strengthening national geospatial information management to create meaningful policy and robust decisions.

In short, “Everything Happens Somewhere”. Our aim is to harness the power of geospatial information for eGovernance, innovation and national sustainable development using the best available information to make decisions that will lead to a more vibrant and resilient community, and prosperous country. Put simply, to become a geo-enabled eNation as part of a wider digital transformation agenda.

The NSDI Strategy will be driven by the NSDI Committee (created by Prime Minister’s resolution No.167 in 2019), established to provide a whole-of government strategic approach to maximise the value and benefits of geospatial information for the whole community.

This National Spatial Data Infrastructure (NSDI) Strategy provides clear direction to a better future by providing a consistent geospatial information management framework, enriched by online web services, mobile apps and community mapping programs for decision-making, economic growth, planning and risk management across the country.

With access to integrated geospatial information, government will be able to make better informed choices about where to invest in infrastructure and services, businesses will be able to leverage geospatial information to create new products and services, and the community will have smart mobile and online access to information for everyday travel.



Understanding, Predicting and Mitigating Risk to People

The COVID-19 pandemic has forced our world to rapidly adapt to confronting social and economic changes and challenges, from local to global levels, across all industries and sectors, and in all areas of supply and demand. Further, the virus has no respect for political borders or physical limitations, no country is left unaffected. Mongolia is no exception and faces unprecedented challenges.

The conventional model of disaster response is predicated on the event being localized or contained within a certain footprint or impact area, and within a certain event window. Whether a flood, hurricane, earthquake, wildfire or building collapse, the response is broadly contained within certain geographic and time extents. With COVID-19, citizens are experiencing impacts at different times, in unpredictable patterns and to varying degrees of severity, due to complex interacting demographic and travel factors.

Many of the challenges are inherently spatial in nature, whether concerning the science of determining disease transmission and resource allocation: *where are ventilators most needed ... which cities or towns should be under lockdown? ... where are infection and mortality rates most rapidly increasing?*

Long-term planning to mitigate the social, economic and potentially environmental impacts is also geographically nuanced: *when it is safe to relax movement restrictions and where? ... what stimulus measures will be most effective and where should they be focused?*

Envisioning a New Future

One of the primary components of a the NSDI is to identify the location of Mongolia's physical assets such as land parcels, natural resources, utilities and the built environment, as well as the results of high impact processes such as climate change and urbanization.

Without knowledge about these locations, decision-making on many matters of national importance is significantly impaired.

The strategic framework (Figure 2) and following vision, mission and goal statements recognise that 'everything happens somewhere' and that knowing what is 'happening' and 'where' is crucial to social, economic and environmental development planning.

Vision

The vision statement reflects a common aspiration to deliver optimal use of geospatial information to effectively measure, analyze, monitor and achieve sustainable social, economic and environmental development – leaving no one behind

Our Vision is for:

Geo-driven eGovernment and innovation that empowers efficient and effective use of geospatial information towards national sustainable development and economic growth.

Mission

The mission statement recognizes that leaders will promote and support innovation and provide the guidance, coordination and standards necessary to deliver integrated geospatial information so that it can be leveraged to achieve sustainable solutions to current and future challenges.

Our Mission is to:

Strengthen integrated geospatial information management and promote the value of geospatial information through leadership, coordination, partnerships, advanced technology and geo-standards.



Vision

Geo-driven eGovernment and innovation that empowers efficient and effective use of geospatial information towards national sustainable development and economic growth.

Mission

Strengthen integrated geospatial information management and promote the value of geospatial information through leadership, coordination, partnerships, advanced technology and geo-standards.

Strategic Alignment

- Land Administration and State Land Management
- National and Sectoral Development Planning
- eGovernance
- Mining
- Transport
- Disaster Management
- Agriculture
- Utilities
- Environment and Tourism
- Defense
- Health

Principles

- Strategic Positioning
- Collaboration
- Leadership
- Data Sharing
- Accountability
- Longevity

Goals

- Quality Information
- Accessible and Useful
- Good Governance
- Innovation and Capacity

Benefits

- Creating New Job Opportunities
- Improved Public Sector Efficiency
- Generating Citizen Services
- Stimulating Private Sector Investment
- Saving Lives in Emergencies
- Improved Adaptation to Climate Change

Action Plan Strategic Pathways

- Governance and Institutions
- Policy and Legal
- Financial
- Data
- Innovation
- Standards
- Partnerships
- Capacity and Education
- Communication and Engagement

Action Plan

The Action Plan is the “heart” of NSDI implementation. The plan is arranged according to the nine strategic pathways of the United Nations endorsed Integrated Geospatial Information Framework (IGIF) (Figure 5). The pathways consist of - Governance and Institutions, Policy and Legal, Financial, Data, Innovation, Standards, Partnerships, Capacity and Education, and Communication and Engagement

The Action Plan is designed for implementation over a 5-year timeframe and operation for a least a further 7 years. It contains a total of 44 inter-dependent actions that form an integrated roadmap with outlines of costs and timeframes.

The pathway actions are illustrated in Figure 6, and discussed below.



Figure 5 The nine strategic pathways of the IGIF (Available at www.ggim.un.org/IGIF).



1 | Governance and Institutions

- Establish NSDI Committee, Program Office, Working Groups and Advisory Group
- Define the NSDI Governance Model
- Formulate the Geospatial Information Value Proposition
- Develop NSDI Geospatial Strategy
- Implement Monitoring and Evaluation Framework



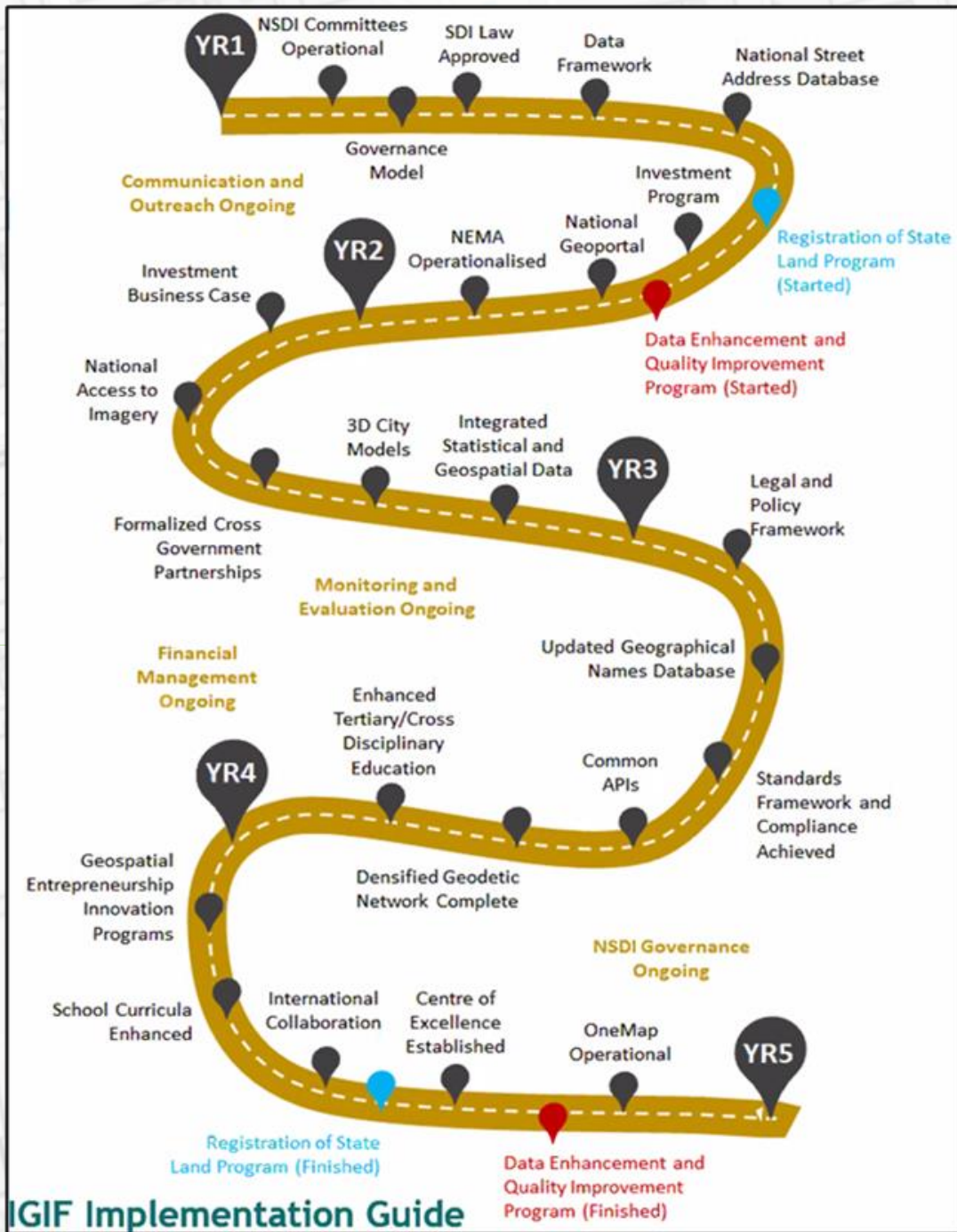
4 | Data

- Establish Data Framework to organize government data holdings
- Densify the Geodetic Framework
- Complete the Cadastre, and Registration of State Land
- Provide National Access to Satellite Imagery
- Conduct Data Enhancement and Quality Improvements
- Create a single National Street Address Database
- Implement a 3D City Model for High Density City Area of Ulaanbaatar and AIMAG centres
- Integrate Statistical and Geospatial Data
- Update Geographical Names Database
- Ensure secure storage and protection of data and systems
- Identify geospatial datasets for Pandemic Response



7 | Partnerships

- Strengthen and Formalize Partnerships between government agencies and private sector within Mongolia
- Establish twinning arrangements with other countries to share experiences
- Seek International Collaboration



Economic Impact of using Geospatial Information in Mongolia

Government Efficiency

Reduced operating costs by having a common National address database

Increased land use fees from complete land parcel register

Improved Commercial Property Tax Collection

12 Bn MNT
(\$4.5 Mn)

72 Bn MNT
(\$26.6 Mn)

7 Bn MNT
(\$2.1 Mn)



Data Sharing

Fee Collection

Tax Revenues

+

Business Growth

Reduced survey costs for mining, construction, utilities and transport

New jobs directly linked to geospatial globally estimated at 4 million, scaled to Mongolia

Land market growth stimulated by auctions of state land

49 Bn MNT
(\$18.3 Mn)

17 Bn MNT
(\$6.2 Mn)

9 Bn MNT
(\$3.5 Mn)



Geodetic Reference Stations

Employment

Land market

+

Social and Environmental Benefits

Improved response to disaster events

Better and quicker urban planning decision making

Global decrease in CO₂ emissions

89 Bn MNT
(\$33.2 Mn)

7 Bn MNT
(\$2.6m)

1686m Tonnes

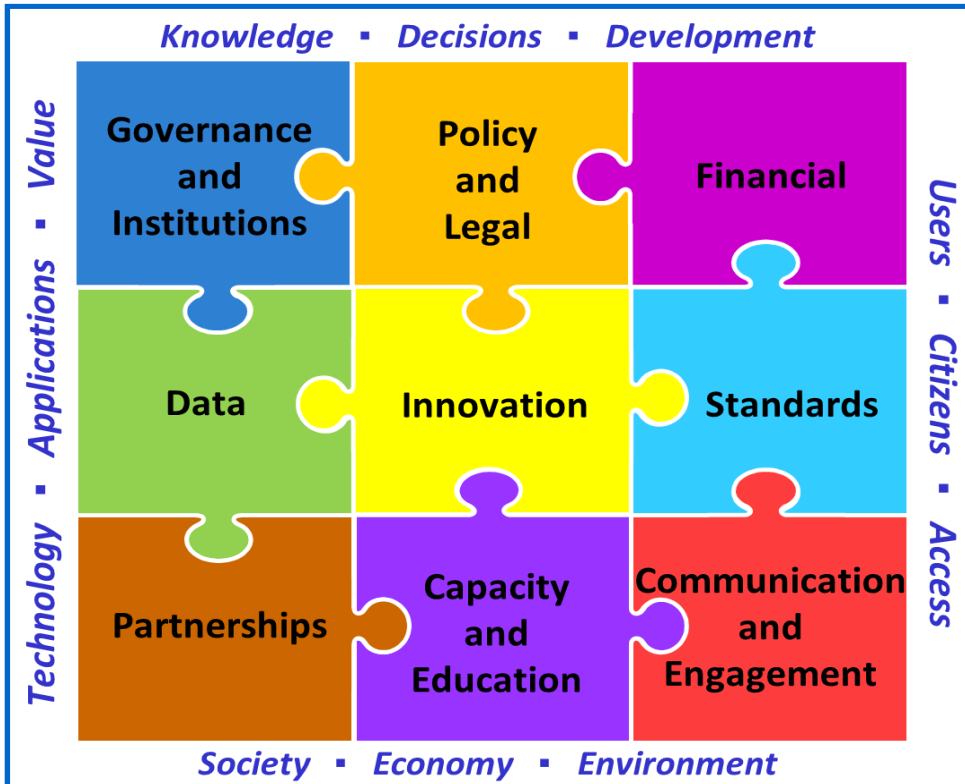


National Emergency Management

Planning

Climate Change

SUMMARY



Strengthening geospatial information management will assist countries in bridging the geospatial digital divide, secure socio-economic prosperity, and leave no one behind.

A Framework for the World, the **Integrated Geospatial Information Framework (IGIF)** is a reference guide for developing and strengthening national arrangements in geospatial information management. It has been designed specifically for developing countries and small island developing States but is now being implemented by developed and developing countries.

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



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Global Geospatial Information Management

Positioning geospatial information to address global challenges

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