

THE INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK : IMPLEMENTATION IN GUYANA

DISSEMINATING THE INTEGRATED FRAMEWORK OF GEOSPATIAL INFORMATION. USES AND APPLICATIONS IN CHILE



12 SEPTEMBER 2019
SANTIAGO, CHILE





GREETINGS FROM GUYANA!!!

- We live on the same continent!
- Population: 779,000 (2018)*
- Official Language: English
- Total Area: 215,000 km²
- Per Capita Income: US\$4,635 (2018)*
- Traditional Economic Base:
 - Agriculture
 - Forestry
 - Mining
- Emerging Oil Economy
- On a Green State Trajectory



*Source: World Bank, 2018





NATIONAL PASTIMES

CRICKET



FOOTBALL



REPUBLIC DAY CELEBRATIONS (2019 – 49TH YEAR AS REPUBLIC)

OUTLINE – IMPLEMENTATION OF THE IGIF IN GUYANA

1. BACKGROUND AND CONTEXT

1. Political Commitment to Sustainable Development (Political Support)
2. Mandate of Guyana Lands and Surveys Commission (Institutional Champion)
3. Sustainable Land Development and Management (SLDM) Project (Assisted Execution)

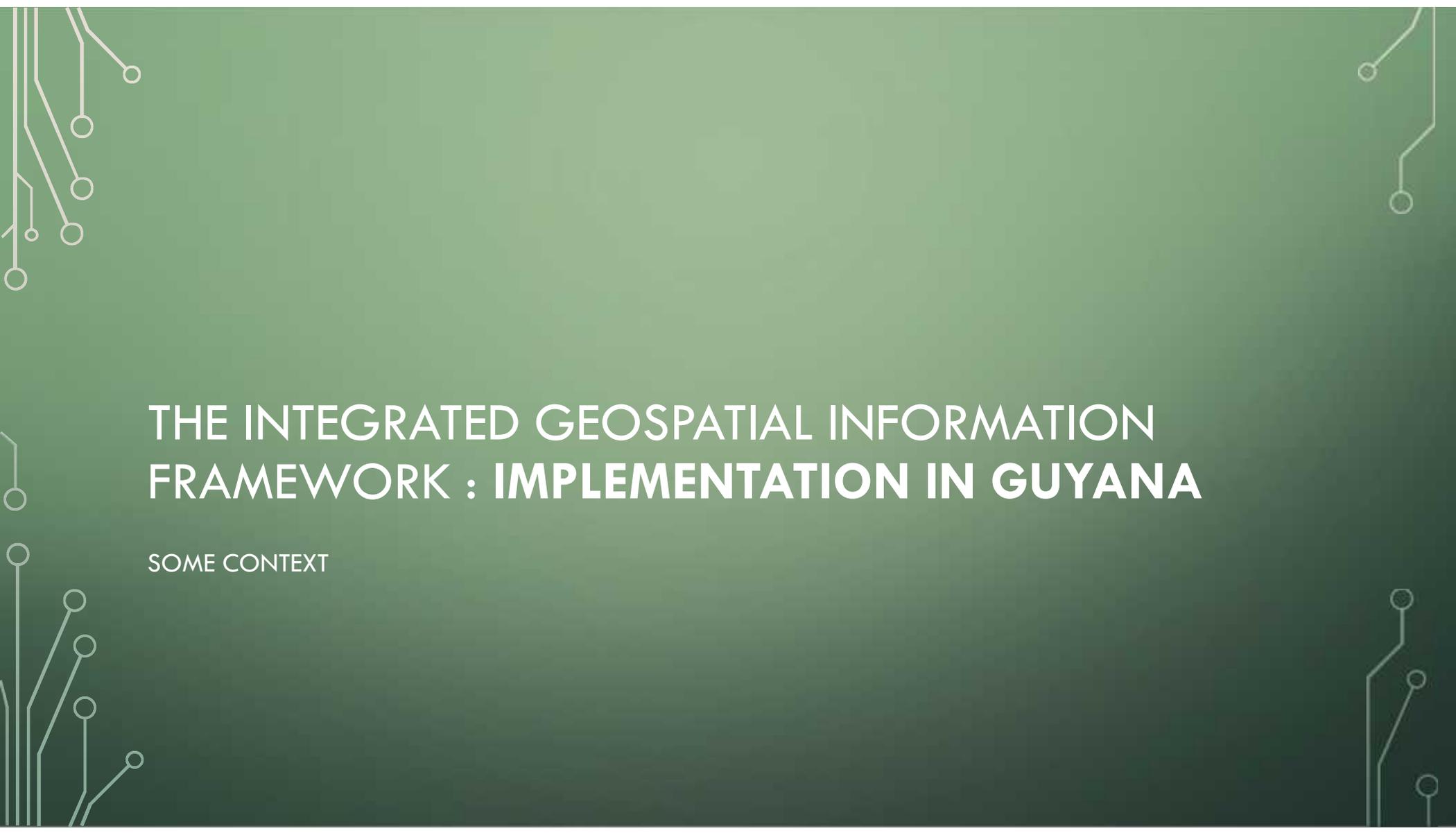
2. TOWARDS IMPLEMENTATION OF IGIF IN GUYANA

1. National Geospatial Policy
2. NSDI Action Plan – Methodology and Content

3. IMPLEMENTATION STATUS OF THE IGIF

1. Overview
2. Strategic Pathways 1-9

4. REFLECTIONS ON IGIF EXPERIENCE TO-DATE



THE INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK : IMPLEMENTATION IN GUYANA

SOME CONTEXT



CONTEXT: 2. MANDATED LEAD GEOSPATIAL AGENCY - GUYANA LANDS & SURVEYS COMMISSION (GLSC)

- Under the Guyana Lands and Surveys Commission Act of 1999, GLSC is legally mandated:
 - To have charge of and act as guardian over all public lands, rivers and creeks of Guyana;
 - To function as Guyana's -
 - National Mapping and Geospatial Agency
 - National Surveying and Cadaster Authority
 - National Public Land Administration Agency (Land Tenure administration, Land Use Planning, Land Development, Land Valuation)
 - Lead Agency Liaison among land agencies
 - Advisor to Government on geospatial related Policy
 - “To formulate policy on geographic and land information and set standards in relation to digital data, establish the framework for a national network of geographic information systems and develop and maintain a parcel-based land information system;” — Function (n) Section 4 (1) of the GLSC Act 15 of 1999 / Cap. 59:05



CONTEXT: GLSC'S NATIONAL GEOSPATIAL INFORMATION SYSTEM CONCEPT MODEL

Spatial data

Model (first developed in 2016) adapted for GLSC's context from the following sources:

1. Enemark, S. (2007, April). Integrated Land-Use Management for Sustainable Development. *International Federation of Surveyors, Article of the Month*.
2. Enemark, S., Williamson, I., & Wallace, J. (2005, December). Building Modern Land Administration Systems in Modern Economies. *Spatial Science, 50(2), 51-68*.
3. Henzel, J. P. (2016). *Improving Ease of Doing Business in Guyana. World Bank Mission to Guyana to Assess ICT Readiness, Trade & Competitiveness*. World Bank.
4. International Federation of Surveyors. (2014). *Cadastre 2014 and Beyond*. (D. Steudler, Ed.) Copenhagen, Denmark: International Federation of Surveyors.
5. Williamson, I. (2008, April). Using Cadastres to Support Sustainable Development. *International Federation of Surveyors, Article of the Month*.

Cadastral Plans

GIS enabled Link

Land Title Register (LMS + rights, responsibilities, restrictions)

Digital Cadastre Database (DCDB)

SDG's 6-9, 11, 13-15

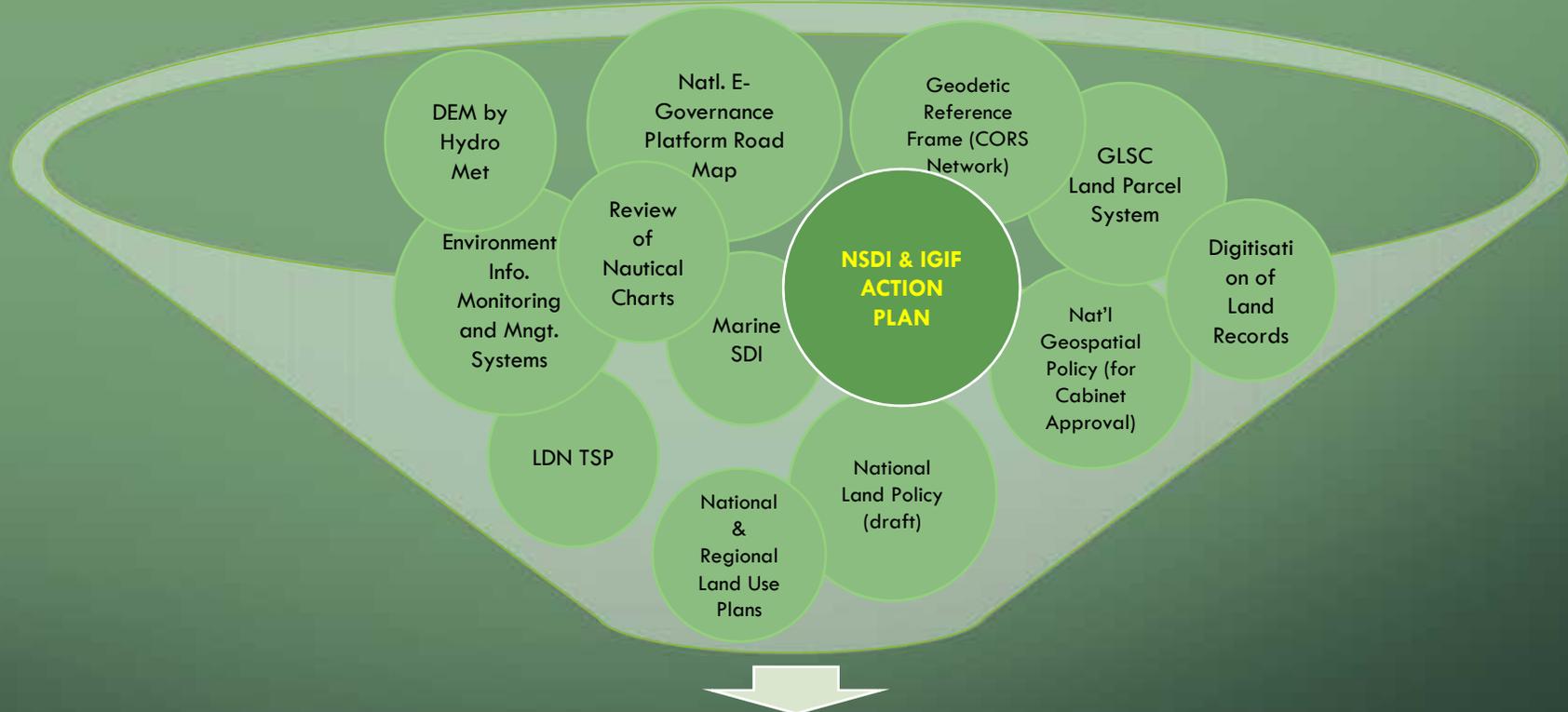
SLM

Social Cohesion

Leverage Market opportunities

me em

CONTEXT: Geospatial Information Development in Guyana



CONTEXT: 3. SLDM PROJECT - MAINSTREAMING SUSTAINABLE LAND DEVELOPMENT AND MANAGEMENT IN THE CO-OPERATIVE REPUBLIC OF GUYANA



Executing Agency:

Guyana Lands & Surveys Commission on behalf of the Government of Guyana



Implementing Partner:

United Nations Food and Agriculture Office (UNFAO)



Source of Financing:

Performance-based payments for avoided deforestation received from Kingdom of Norway under the Guyana REDD+ Investment Fund (GRIF)

Project Period:

Mid 2017- Mid 2021 (4 years)

Indicative Outcomes

Outcome 1: Sustainable Land Development and Management (SLDM) Mainstreamed In Policy, Institutional and Governance Mechanisms to Prevent Degradation and Restore Degraded Lands

CD(6)

Outcome 2: Strengthened Institutional and Human Capacity for Participatory and Integrated SLDM

Outcome 3: Local Governance Strengthened in 3 Regions for Implementing SLDM

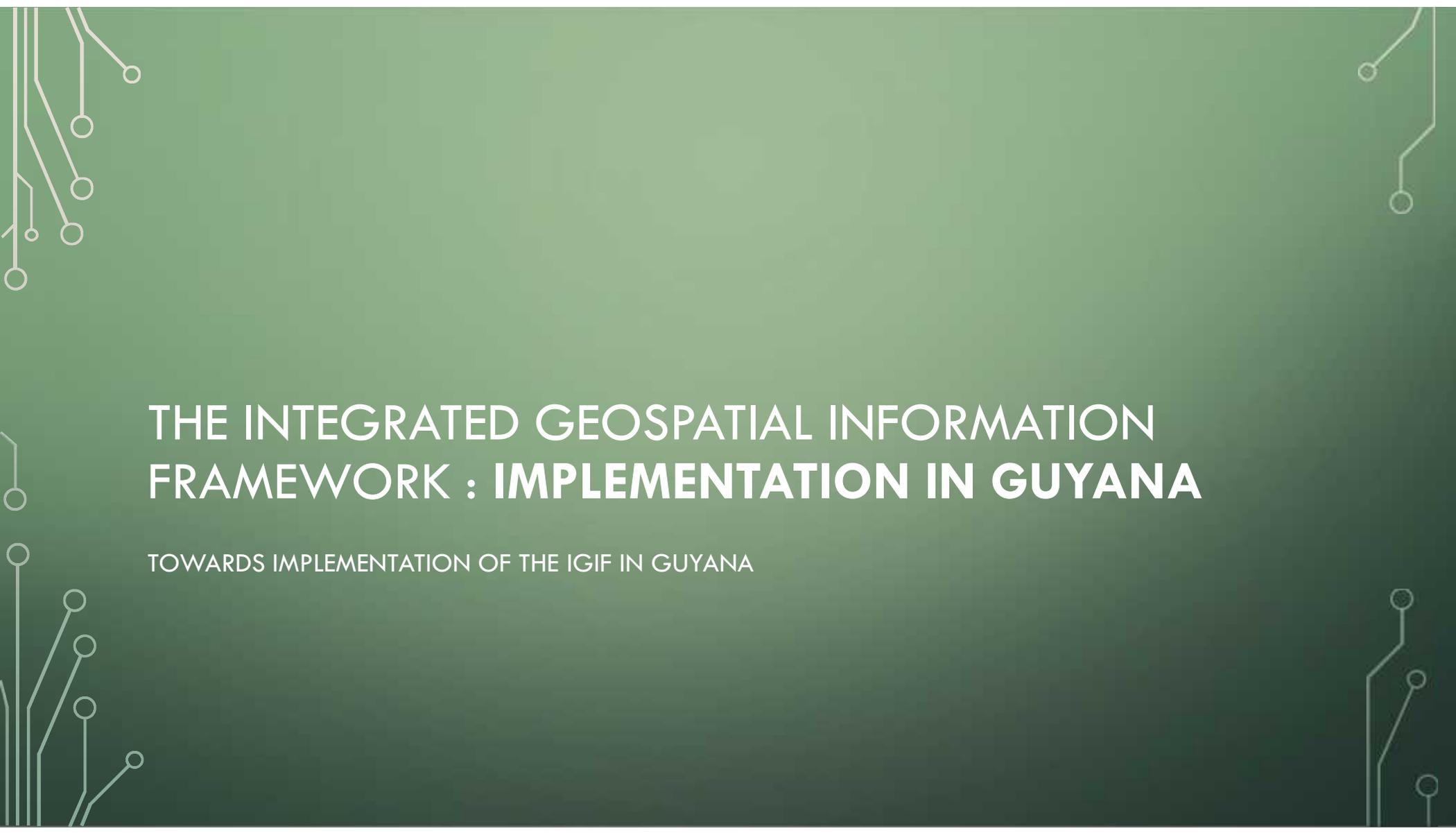


Diapositiva 11

CD(6

SLDM

Cromeyer, Diego (RLCXD), 28-06-2019



THE INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK : IMPLEMENTATION IN GUYANA

TOWARDS IMPLEMENTATION OF THE IGIF IN GUYANA

TOWARDS IGIF IMPLEMENTATION: NATIONAL GEOSPATIAL POLICY

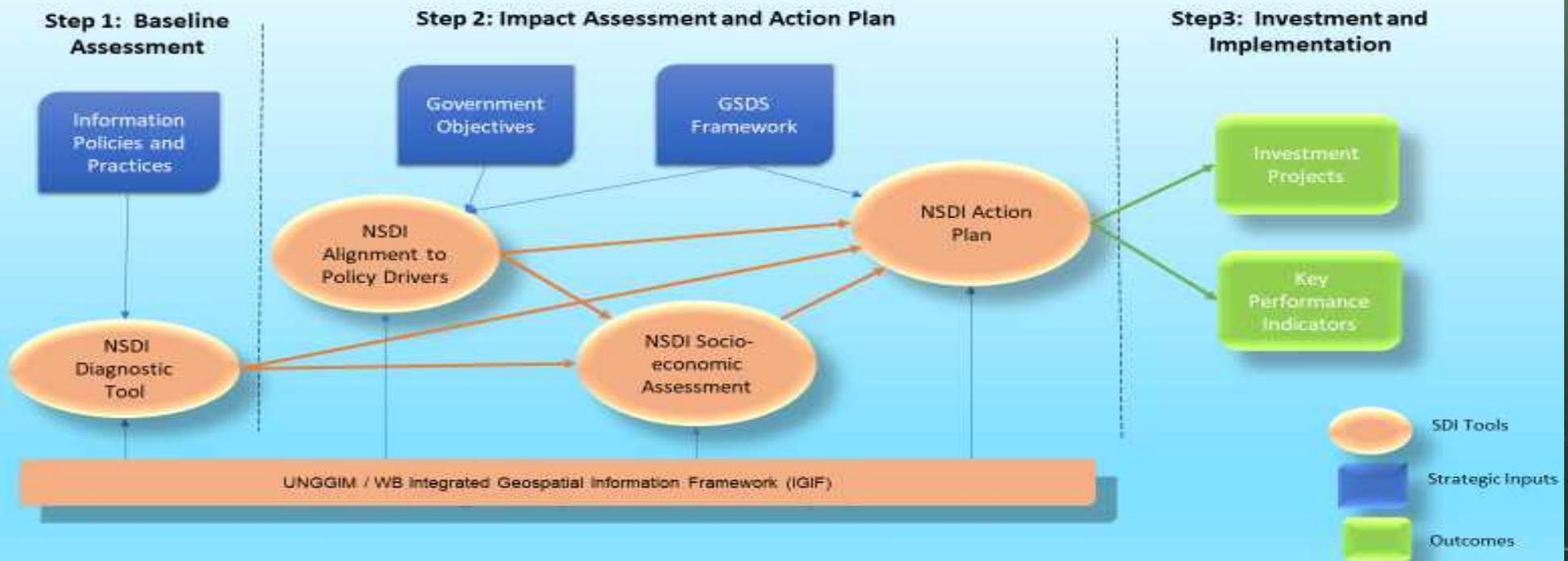
- July 3-5, 2018 ECLAC Workshop in Georgetown - **Towards a National Geospatial Framework and Policy in Guyana**
- 5th iteration of National GIS Policy was reviewed using the IGIF Overarching Strategic Framework
- Policy was revised and sent to GoG Cabinet in January 2019, where it is pending approval.



TOWARDS IGIF IMPLEMENTATION: NSDI ASSESSMENT METHODOLOGY WITH ACCOMPANYING ANALYTICAL TOOLS

(UNGGIM, WB, UNFAO)

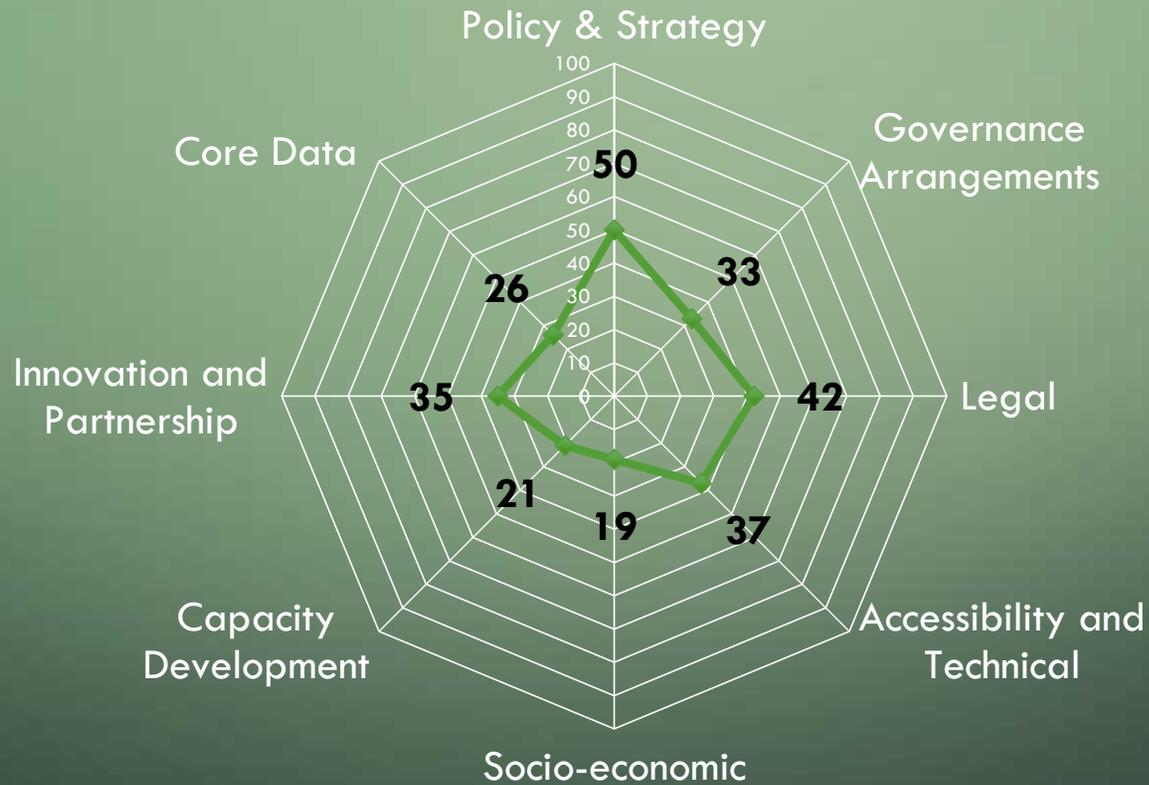
Methodology



DELIVERABLES FROM ASSESSMENT METHODOLOGY AND TOOLS



NSDI DIAGNOSTIC SUMMARY, JANUARY 2019



NSDI ALIGNMENT TO POLICY DRIVERS

Key Policy and Reference Documents

- Framework for the Green State Development Strategy (GSDS)
- Digital Governance Roadmap
- Guyana Energy Strategy
- SLDM Project Document
- National Action Plan (NAP) to combat Land Degradation
- National Land Use Plan
- SDGs
- Integrated Geospatial Information Framework (IGIF) Part 1
- ECLAC Geospatial Policy Consultation
- World Bank ICT Assessment Report 2016
- And others...

Thematic Drivers for Investment

- 1. Green State and Low Carbon Development**
- 2. Sustainable Land Management**
- 3. E-Government**
- 4. Support for monitoring and reporting on Sustainable Development Goals**
- 5. Climate change and disaster risk management**
- 6. Environmental Management**
- 7. Improve Capacity and skills of Human Resources**
- 8. Managing Economic Growth**

Geospatial Use Cases

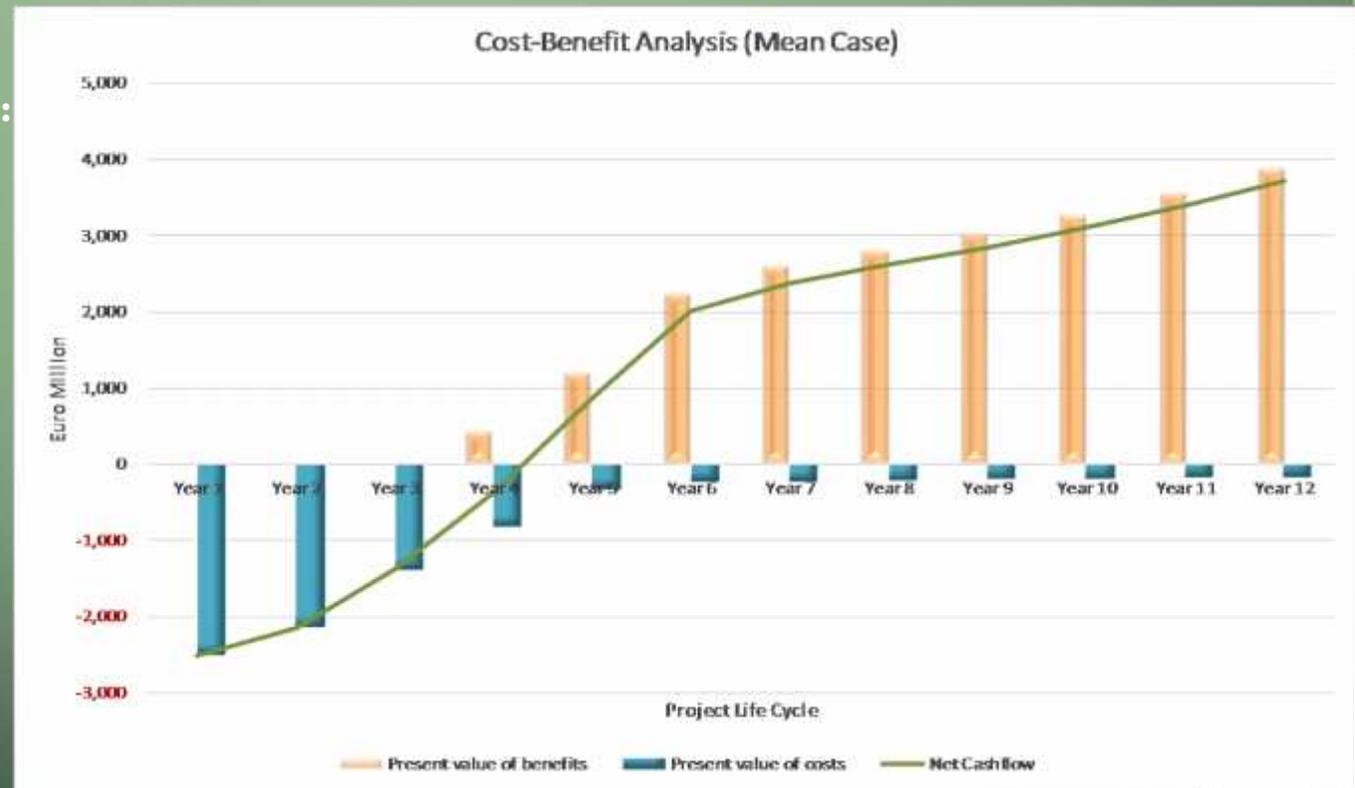
Theme	No. of Use Cases (Investment Priority)
1	3 (M x2, L x1)
2	5 (H x5)
3	4 (H x3, M x1)
4	2 (H x2)
5	3 (H x2, M x1)
6	2 (M x2)
7	4 (H x2, M x2)
8	5 (H x5)

NSDI SOCIO-ECONOMIC ASSESSMENT: QUANTIFIED MARKET IMPACTS

Ref	Impact	Evidence	Methodology	Net Undiscounted Value of Impacts (US\$)
1	Improved National Geospatial Data Sharing	Usage assessment	Multiplier effect of information sharing	5.2 million
2	Land Market Growth	Comparable studies	Benefits transfer from Bulgarian Study	5.7 million
3	Increasing Revenue from Leasing of State Land	Current revenues plus expert opinion	Business process modelling	3.3 million
4	New Geospatial Products and Services	Global Study	Scaling based on size and maturity of Guyanese economy	15.9 million
5	Improved Forestry Revenues	National Statistics and expert opinion	Estimated uplift to current levels of income	2.1 million
6	Reduced Loss and Damage from Better Flood Prediction	Internationally reported economic costs of floods	Expert judgement (4% improvement) from improved Digital Elevation Models	2.2 million
7	Integration of Marine and Terrestrial NSDI	Expert opinion and International studies	Reduced shipping insurance costs and extra cruise ship visits	2.5 million

PROVISIONAL RETURN ON INVESTMENT ANALYSIS

- Benefit to Cost Ratio: 2.7:1 (RoI of 270%)
- Net Present Value: US\$ 13m
- Project Life Cycle: 5 years development 7 years operation
- Discount Rate: 6%



NSDI SOCIO-ECONOMIC ASSESSMENT: UN-QUANTIFIED BENEFITS

- 1) Reduced Number of Land and Property-related Court Cases
- 2) Cost Savings in Infrastructure Design and Construction
- 3) Improved Water Services
- 4) Smarter Development Planning
- 5) More accurate Land Valuation
- 6) Higher accuracy Land Surveys from Re-established CORS Network
- 7) Improved SDG Reporting and Population Census
- 8) Support for Climate Change Adaptation
- 9) Optimized Site Selection
- 10) Reduced Data Procurement Costs
- 11) Enhanced support for Aviation Industry

IGIF - NSDI ACTION PLAN

- Developed under the SLDM Project, Approved by UNFAO & GLSC in January 2019 following highly consultative and review period (5 months).
- This document presents an Action Plan, based on the IGIF, for development of a National Spatial Data Infrastructure (NSDI) for Guyana over a 5-year period and outlines its socio-economic benefits.
- The implementation of the action plan will require an indicative level of investment of US\$7.8m for the 5-year period.
- It is a living document!
- 80 pages
- Guyana is one of the first countries globally to start implementing the UNGGIM IGIF

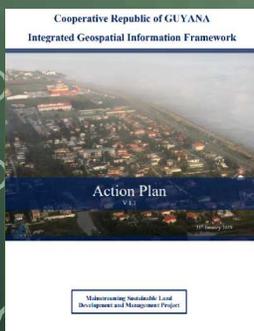
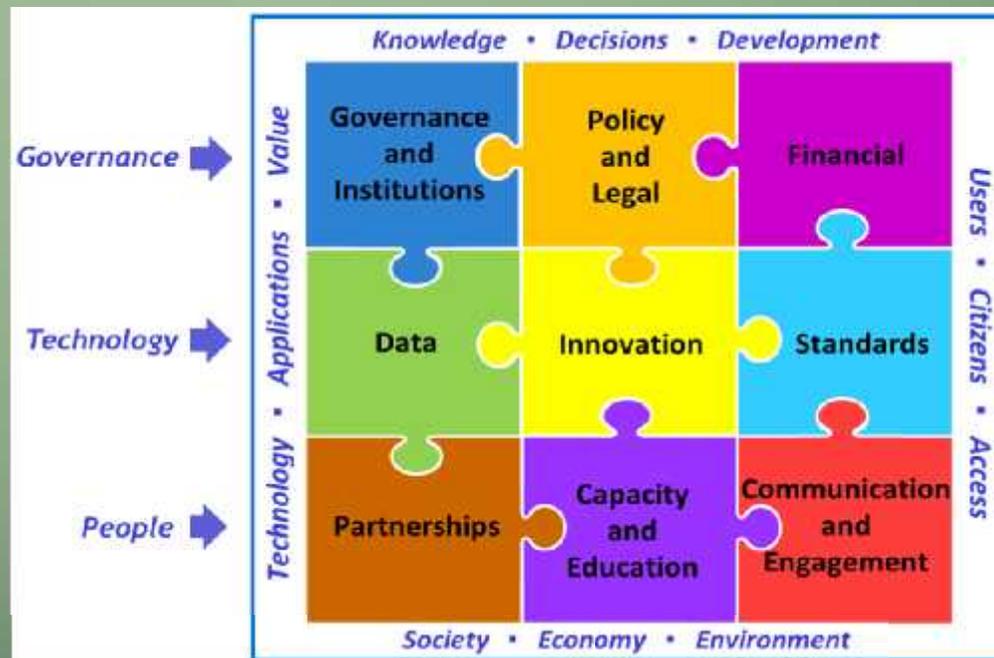
Cooperative Republic of GUYANA Integrated Geospatial Information Framework

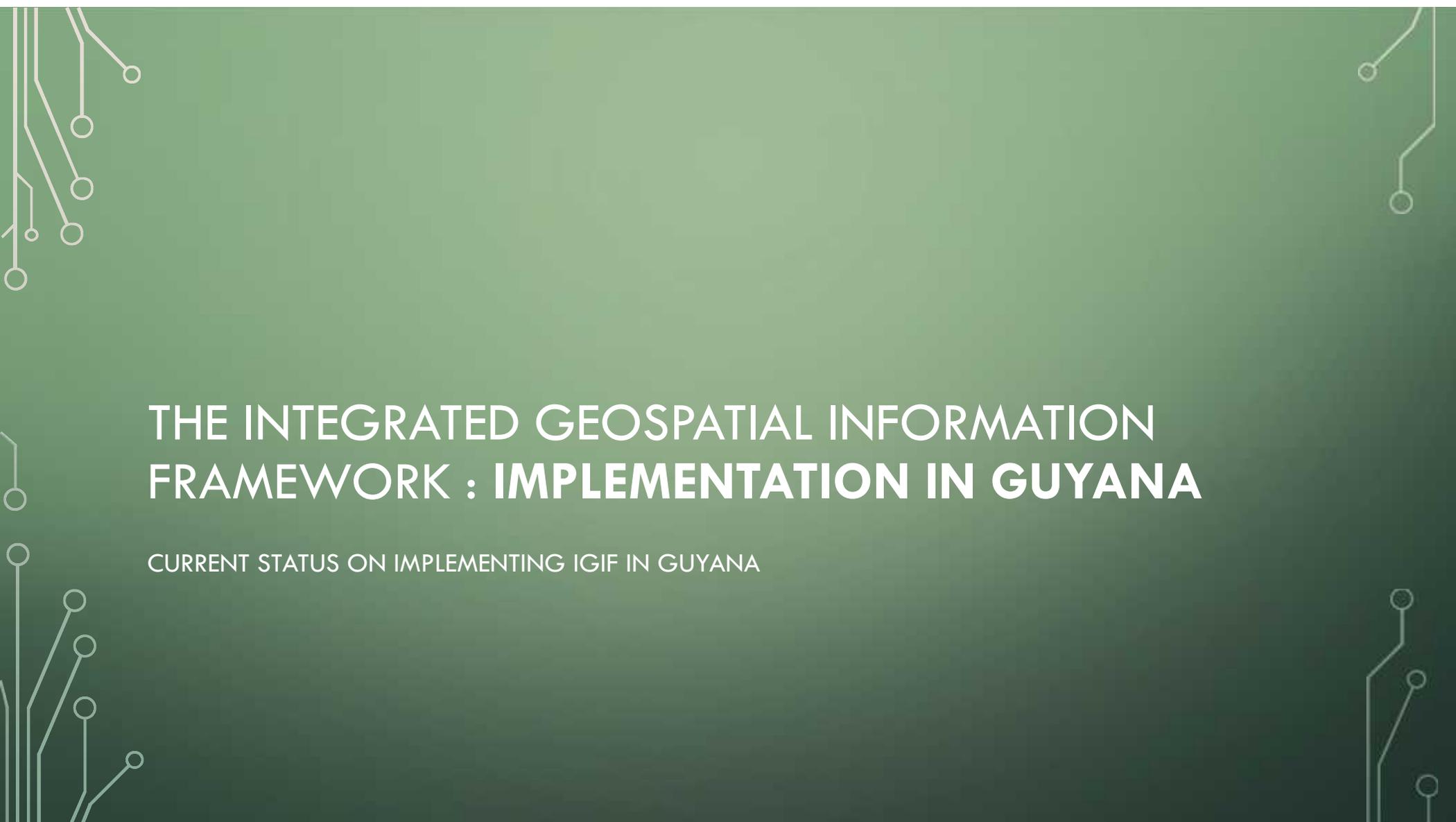
Table of Contents

Preface	1
Table of Contents	2
Executive Summary	3
1. Context	1
2. Country Overview	1
3. Geospatial Information in Guyana	1
4. Business Case for NSDI	1
5. Vision	2
6. The Integrated Geospatial Information Framework	3
7. Strategic Pathways	3
8. Implementation Plan	5
9. Conclusions and Next Steps	7
Annex A: Selected Acronyms	7
Annex B: Overview of Data Availability	7

ACTION PLAN'S ALIGNMENT TO THE UNGGIM IGIF

- The Action plan sets out 24 key Actions grouped according to the 9 IGIF strategic pathways and addresses the 14 UNGGIM fundamental geospatial data themes
- Prioritizes the Actions and identifies KPIs for each Pathway.



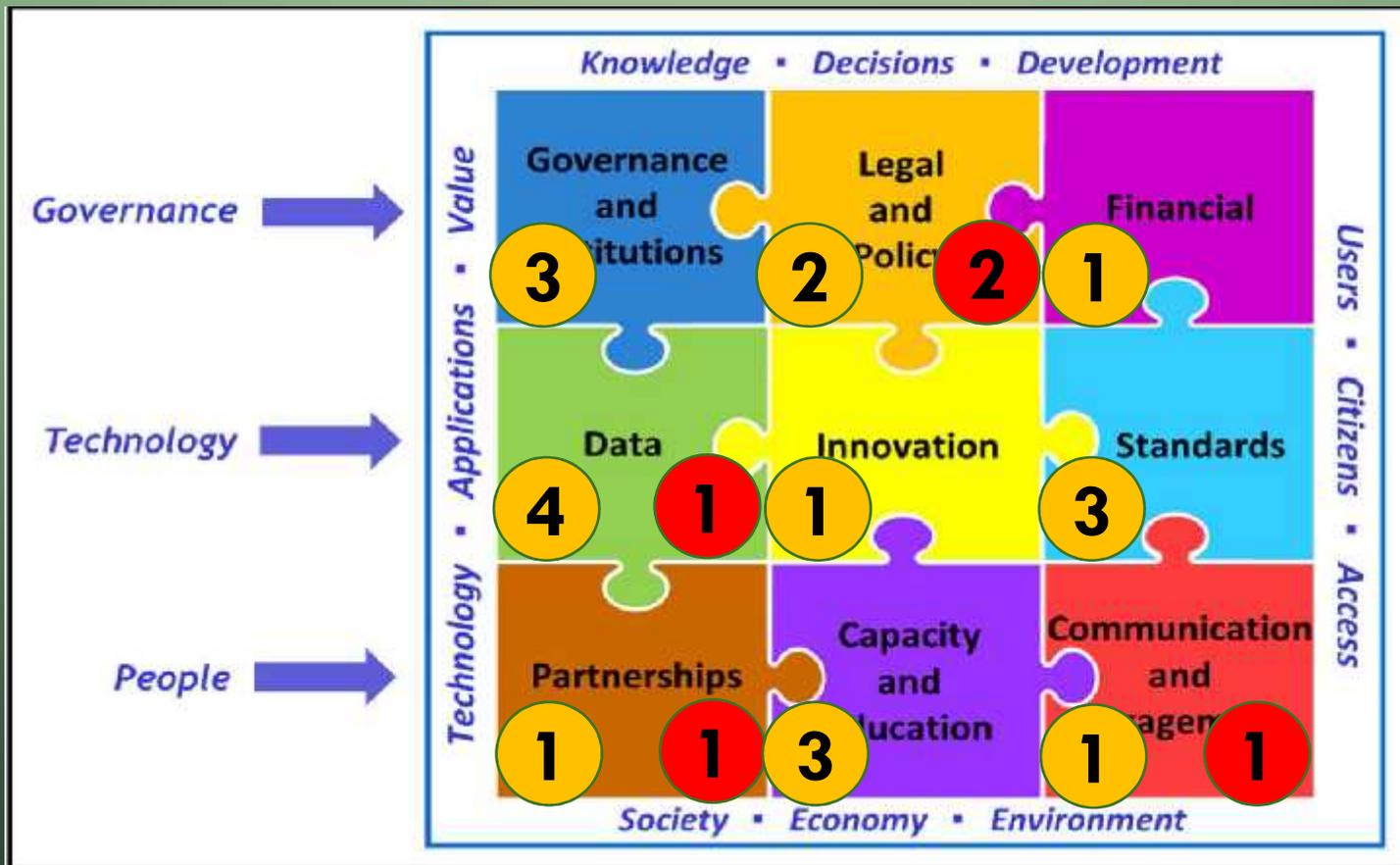


THE INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK : **IMPLEMENTATION IN GUYANA**

CURRENT STATUS ON IMPLEMENTING IGIF IN GUYANA

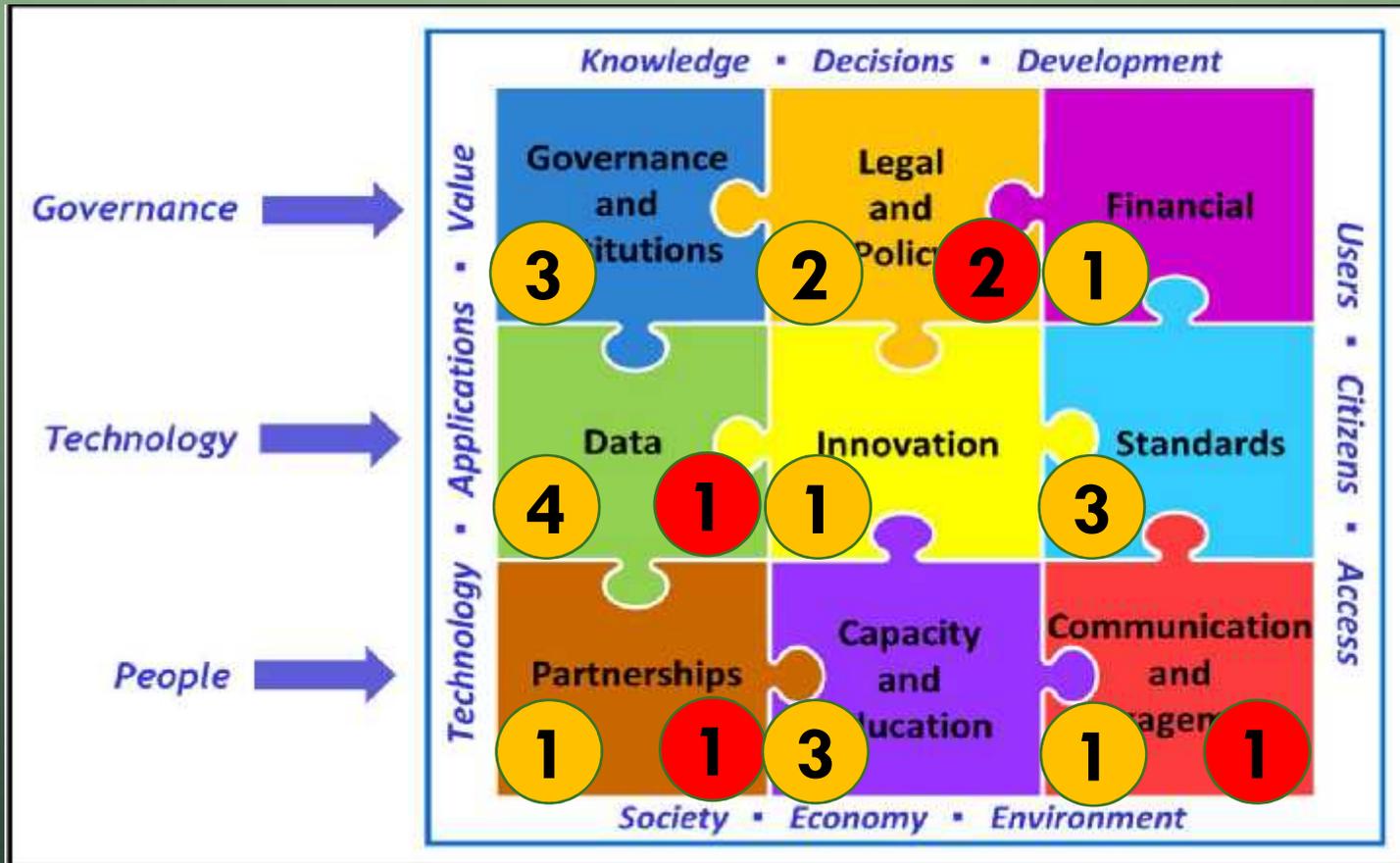
NSDI / IGIF ACTION PLAN: STATUS (JAN-SEPT 2019)

ACTIONS: ■ COMPLETED ■ IN PROCESS ■ NOT STARTED



NSDI / IGIF ACTION PLAN: STATUS (JAN-SEPT 2019)

ACTIONS: ■ COMPLETED ■ IN PROCESS ■ NOT STARTED



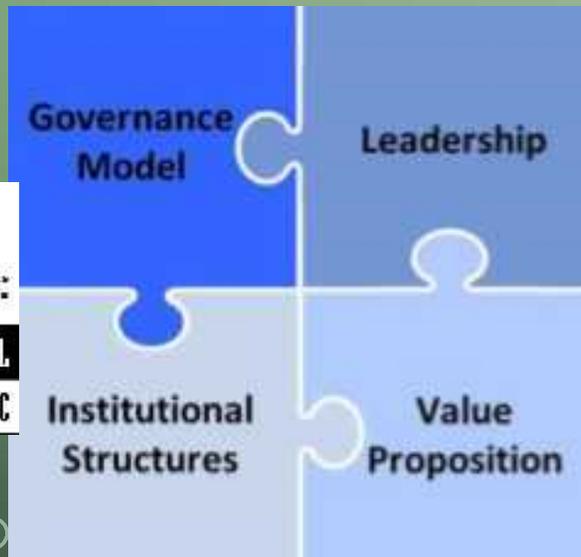
■ COMPLETED ■ IN PROCESS ■ NOT STARTED

NSDI / IGIF ACTION PLAN: STATUS (SEPTEMBER 2019)

STRATEGIC PATHWAY 1: GOVERNANCE & INSTITUTIONS

ACTIONS

KPIs



- Ministerial Approval of National Geospatial Policy (High Priority)
- Establish Geospatial Advisory Committee (GAC) (High Priority)
- Establish Working Groups (Medium Priority)

- Geospatial Policy (approval within 3 months)
- GAC and working groups established and operational within 6 months

■ COMPLETED ■ IN PROCESS ■ NOT STARTED

NSDI / IGIF ACTION PLAN: STATUS (SEPTEMBER 2019)

STRATEGIC PATHWAY 2: POLICY AND LEGAL



ACTIONS

- Update Land Surveys legislation to support cadastral upgrading
- Create Data Sharing Agreement (High Priority)
- NSDI Regulations (Medium Priority)
- Data Protection and Pricing and Licensing (Low Priority)

KPIs

- ▶ Update Land Surveys legislation within 12 months.
- ▶ Data sharing agreement in place and regular operational sharing between 5 organisations within 12 months.
- ▶ Regular operational sharing between all major stakeholders within 3 years.

■ COMPLETED ■ IN PROCESS ■ NOT STARTED

NSDI / IGIF ACTION PLAN: STATUS (SEPTEMBER 2019)

STRATEGIC PATHWAY 3:

FINANCIAL



Actions

- Develop long-term GLSC Business Model (Medium Priority)

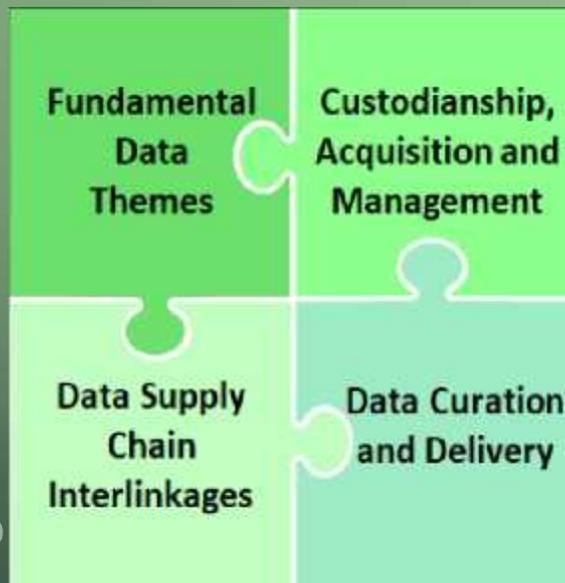
KPIs

- Long-term GLSC Business Model approved within 18 months

■ COMPLETED ■ IN PROCESS ■ NOT STARTED

NSDI / IGIF ACTION PLAN: STATUS (SEPTEMBER 2019)

STRATEGIC PATHWAY 4: DATA



ACTIONS

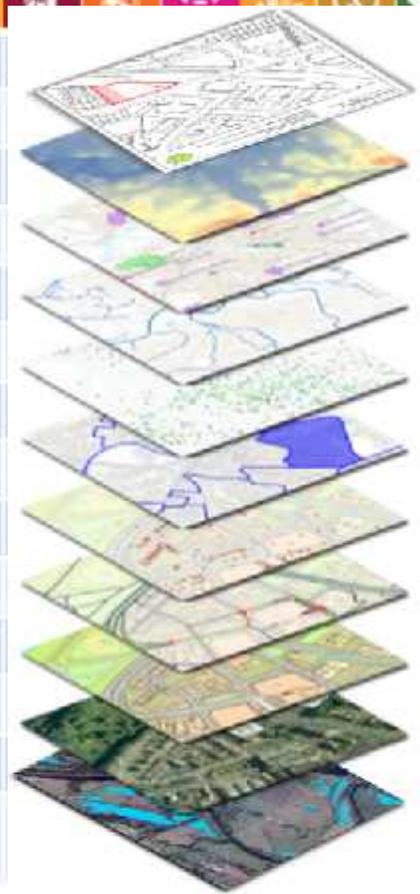
- Create National Discovery Geoportal (High Priority)
- Rationalise State Land Leasing Process (Very high Priority)
- National Access to Satellite Imagery (High Priority)
- Create a single National Street Address Database (High Priority)
- Hardware, Network and Software Needs to Support NSDI (Very High Priority)

KPIs

- ▶ Discovery Metadata database populated with data from 10 key suppliers and openly accessible on the web within 6 months.
- ▶ Rationalise State Land Leasing process including new software live within 2 years.
- ▶ National street address database operational within 2 years.
- ▶ National coverage of updated topographic base mapping within 5 years.

Data themes linked to Sustainable Development Goals

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Addresses				*		*	*										
Bldgs and Settlements	*		*	*		*	*										
Elevation and depth	*	*	*			*	*										
Functional Areas	*	*	*	*	*	*	*										
Geographical Names	*	*	*	*	*	*	*										
Geology and Soils		*	*			*	*										
Land Cover/Land Use	*	*	*		*	*	*										
Land Parcels	*	*		*													
Orthoimagery		*				*											
Physical infrastructure			*	*		*	*										
Population distribution	*	*	*	*	*	*	*										
Transport Networks		*	*														
Water		*	*			*	*										
Global Geodetic Reference Framework		*				*	*										



- Geodetic Reference Framework
- Geographical Names
- Addresses
- Functional Areas
- Settlements
- Land Parcels
- Transport Networks
- Elevation/Depth
- Population Distribution
- Land Cover/Use
- Geology/Soils
- Physical Infrastructure
- Ortho Imagery
- Water
- Utilities

■ COMPLETED ■ IN PROCESS ■ NOT STARTED

NSDI / IGIF ACTION PLAN: STATUS (SEPTEMBER 2019)

STRATEGIC PATHWAY 5: INNOVATION

ACTIONS



■ Guyana Centre of Geospatial Excellence (High Priority)

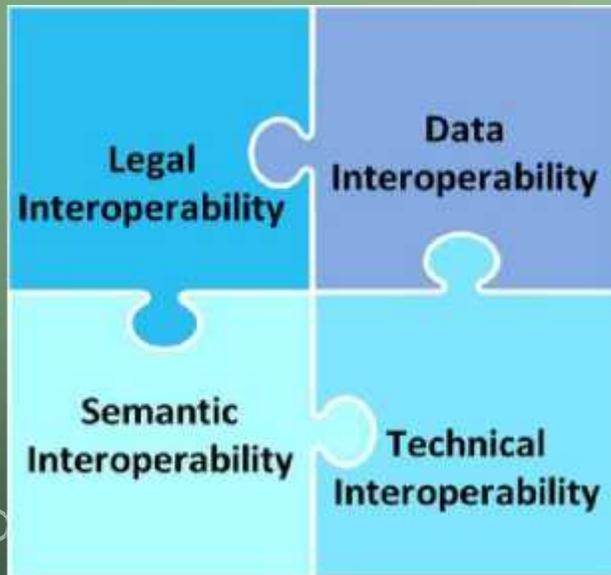
KPIs

- ▶ Centre of Excellence terms of reference, funding and recruitment plans approved by GAC within 12 months
- ▶ Centre of Excellence fully operational within 2 years.

■ COMPLETED ■ IN PROCESS ■ NOT STARTED

NSDI / IGIF ACTION PLAN: STATUS (SEPTEMBER 2019)

STRATEGIC PATHWAY 6: STANDARDS



ACTIONS

- Development and implementation of standards policy (High priority)

- Discovery Metadata
- Base Mapping / National Topographic Database
- Addressing

KPIs

- ▶ Street Addressing content standard agreed with 12 months.
- ▶ Content standards for 10 fundamental data themes agreed within 3 years.

■ COMPLETED ■ IN PROCESS ■ NOT STARTED

NSDI / IGIF ACTION PLAN: STATUS (SEPTEMBER 2019)

STRATEGIC PATHWAY 7:

PARTNERSHIP



Actions

- Define Scope of a Partnership with International NSDI Organisations
- Support creation of Guyana Association for Geospatial Information

KPIs

- Study visits to two countries completed within 12 months.
- Guyana Association of Geospatial Information formed within 2 years

■ COMPLETED ■ IN PROCESS ■ NOT STARTED

NSDI / IGIF ACTION PLAN: STATUS (SEPTEMBER 2019)

STRATEGIC PATHWAY 8: CAPACITY & EDUCATION



ACTIONS

- Consolidate National Geospatial and Land Administration Capabilities at Tertiary Level (High Priority)
- Geospatial Information in the School Curriculum (Medium Priority)
- Foster Geospatial Entrepreneurship (Medium Priority)

KPIs

- ▶ GIS Laboratory at University of Guyana opened within 12 months
- ▶ 3 new geospatial topics within senior school curriculum within 2 years
- ▶ Land management and land valuation courses graduating students within 3 years

■ COMPLETED ■ IN PROCESS ■ NOT STARTED

NSDI / IGIF ACTION PLAN: STATUS (SEPTEMBER 2019)

STRATEGIC PATHWAY 9: COMMUNICATION & ENGAGEMENT

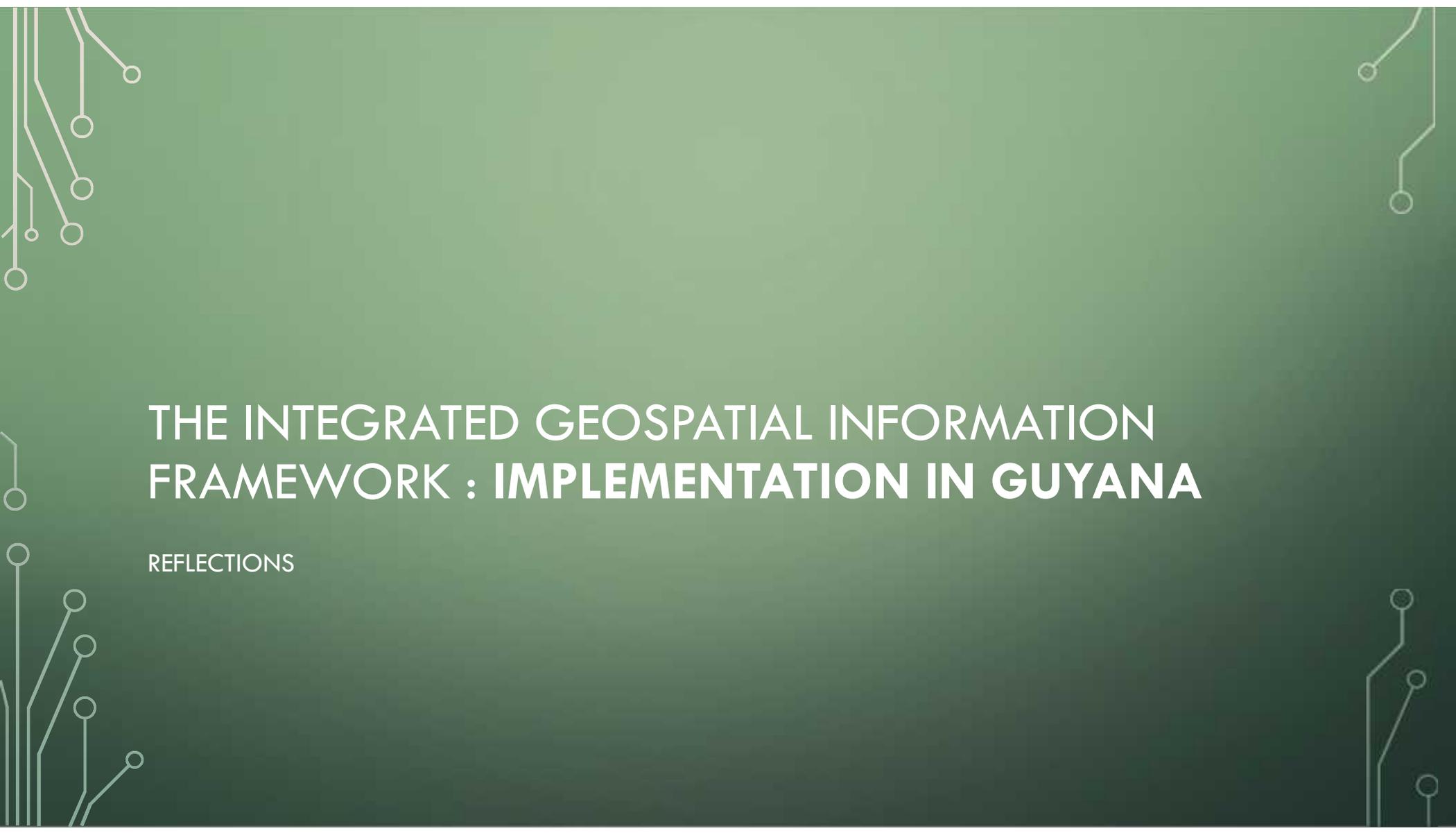


Actions

- Create Outreach Group (High Priority)
- Monitoring and Evaluation Framework (High Priority)

KPIs

- Monitoring and Evaluation framework approved by GAC within 6 months
- Outreach group staffed and communications plan approved within 12 months



THE INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK : IMPLEMENTATION IN GUYANA

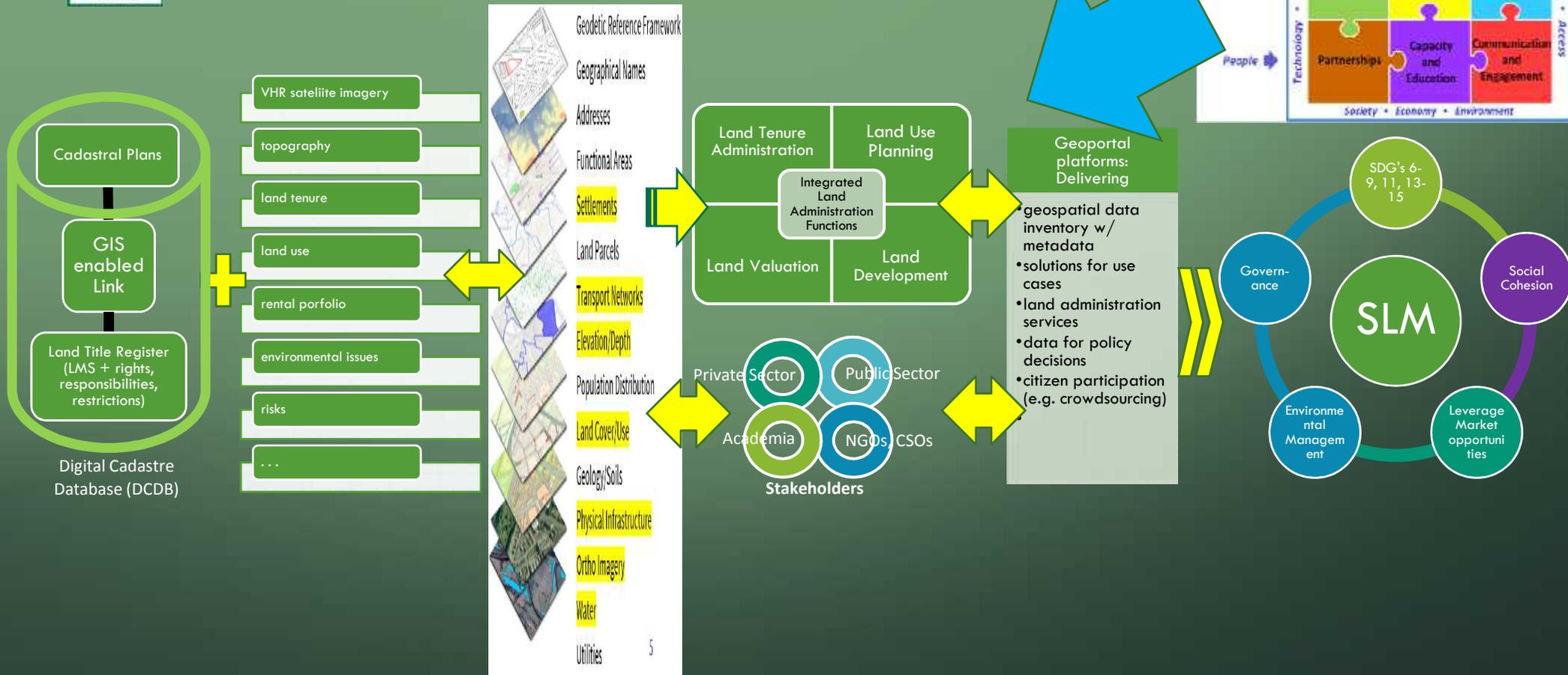
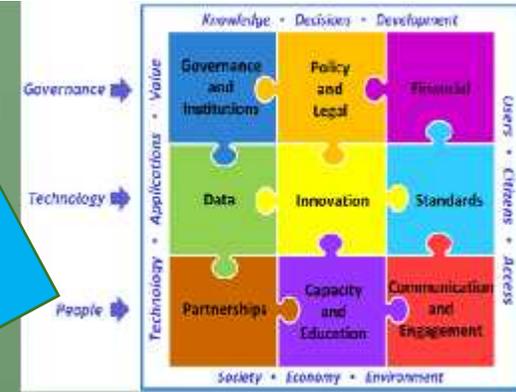
REFLECTIONS

REFLECTIONS ON THE IGIF IN GUYANA

1. Incorporation of IGIF began in Guyana (July 2018 with ECLAC workshop, Sept. 2018 with start of NSDI diagnostic) before and right after formal adoption of IGIF Part 1: Overarching Strategic Framework (August 2018) and without reference to IGIF Part 2: Implementation Guide.
2. IGIF Strategic Framework proved to be a useful, potent and easily communicated tool to lay out an approach to a daunting national project – the NSDI

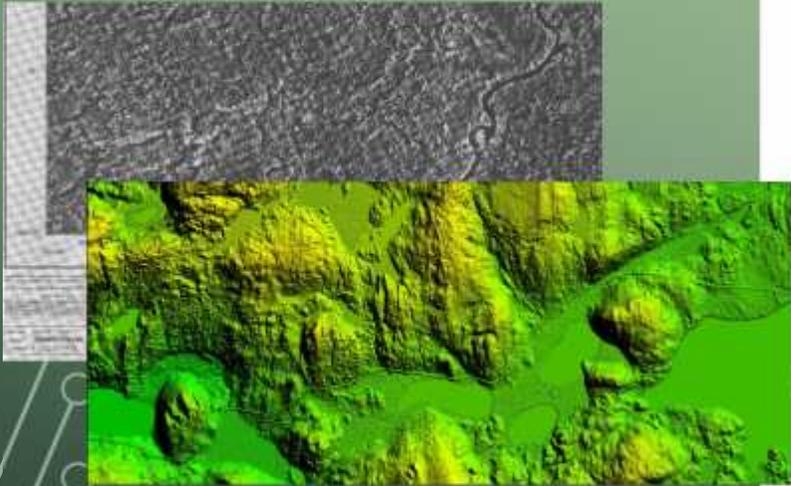


CONTEXT: GLSC'S NATIONAL GEOSPATIAL INFORMATION SYSTEM CONCEPT MODEL

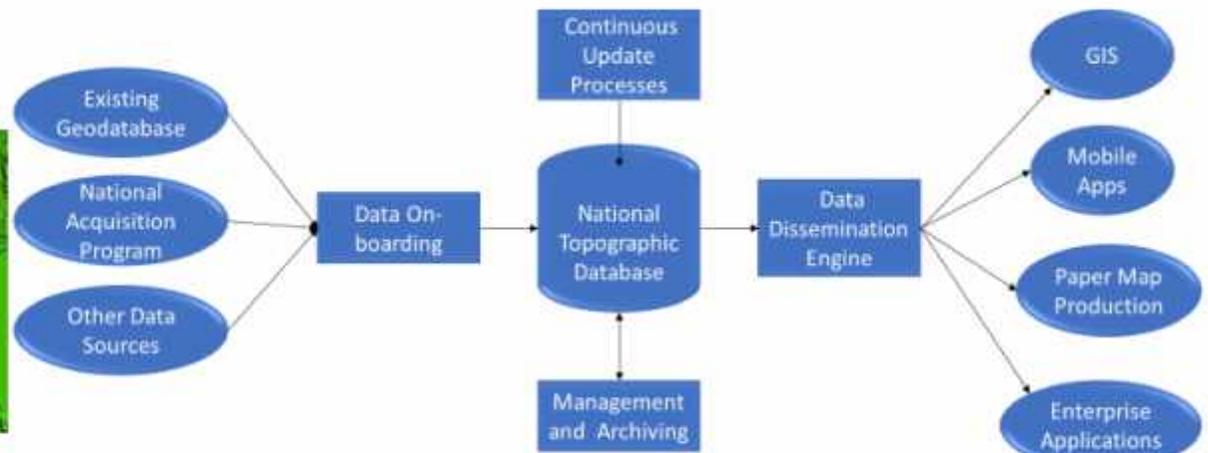


REFLECTIONS ON THE IGIF I N GUYANA

3. Provided an opportunity to 'leapfrog' to innovations that will drive digital transformation (e.g. creating the national topographic database not just updating base mapping)



NTDb Conceptual Architecture



REFLECTIONS ON THE IGIF I N GUYANA

4. Significant gaps in capacity and education relating to geospatial sector have been highlighted and are being addressed. Partnerships are being sought in academic and technical areas.

- Creation of NSDI Geoportal using open source technology;
- Acquiring, assessing, consuming, managing OE data like LiDAR

REFLECTIONS ON THE IGIF I N GUYANA

5. A convergence of a legally mandated institutional leader (led by a champion), political support and international partnerships (Norway, UNFAO, UNGGIM, ELCLAC) made this journey possible so far.

- Challenge will be to sustain such a recipe and at the same time rapidly innovate and build capacity to adopt to the inevitable changes in the ingredients.

Kaieteur Falls

MUCHAS GRACIAS!
PREGUNTAS?



- Guyana Lands and Surveys Commission
- Email: ceoffice@glsc.gov.gy
- Website: <http://www.glsc.gov.gy>