

# TOWARDS THE IMPLEMENTATION OF THE INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK IGIF:

## THE CASE OF GUYANA

OCTOBER 2019  
MEXICO CITY

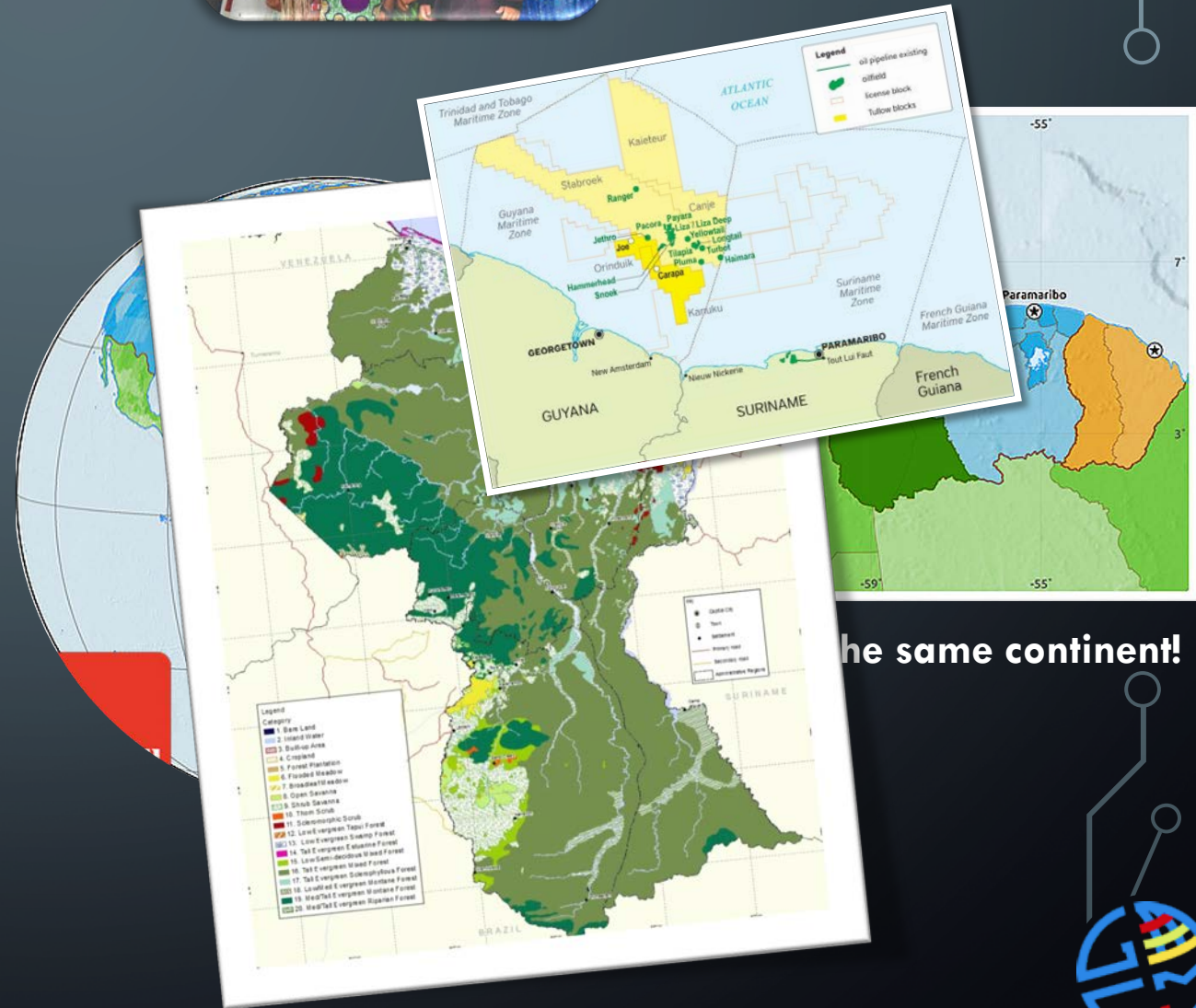


**UN-GGIM:Américas**  
COMITÉ REGIONAL DE LAS  
NACIONES UNIDAS SOBRE  
LA GESTIÓN GLOBAL  
DE INFORMACIÓN GEOESPACIAL  
PARA LAS AMÉRICAS

# GREETINGS FROM GUYANA!



- **Population (2018)\*:** 779,000
- **Official Language:** English
- **Total Area:** 215,000 km<sup>2</sup>
- **Per Capita Income (2018)\*:** US\$4,635
- **Traditional Economic Base:**
  - Agriculture
  - Forestry
  - Mining
- **Emerging Oil Economy**
- **On a Green State Trajectory**



the same continent!

\*Source: World Bank, 2018



# 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

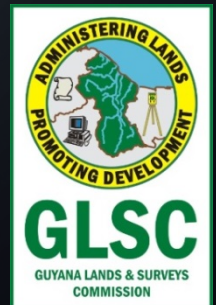
## 4. REFLECTIONS ON IGIF EXPERIENCE TO-DATE





# THE INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK : IMPLEMENTATION IN GUYANA

SOME CONTEXT



# CONTEXT: POLITICAL COMMITMENT TO SUSTAINABLE DEVELOPMENT



Green State  
Development Strategy  
VISION 2040

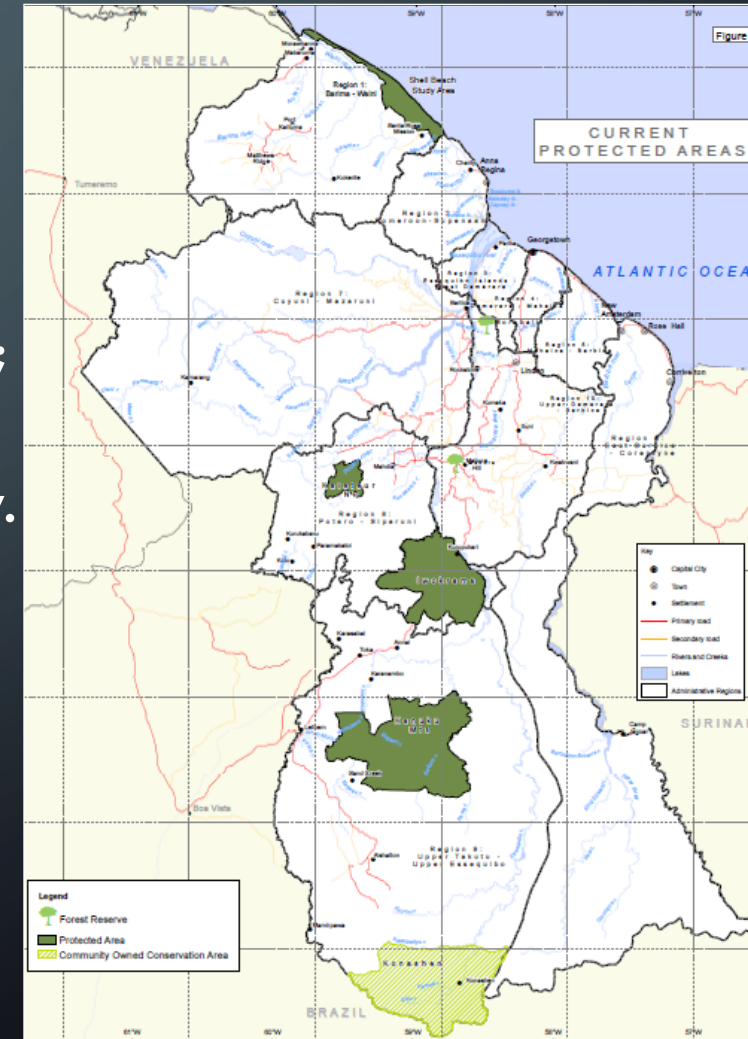
- The Green State Development Strategy (GSDS): Vision 2040 is Guyana's 20-year, national development policy that reflects the guiding vision and principles of the 'Green Agenda'.
- The Strategy promotes 3 key messages:
  - Sustainably manage natural resource wealth;
  - Support economic resilience;
  - Build human capital and institutional capacity.



Convention to Combat  
Desertification



Convention on  
Biological Diversity





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

**Mandated under the Guyana Lands & Surveys Commission Act, 1999:**

- To have charge of and act as guardian over all public lands, rivers and creeks of Guyana;
- To establish and maintain the national survey control system, set standards for the collection of photogrammetric data and specify the technical requirements for land surveys;
- 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;
- To advise Government on policy relating to public lands, land surveys and any other matters related to the functions of the Commission.

Surveying

Mapping

Land  
Administration

Planning



# CONTEXT: 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:**

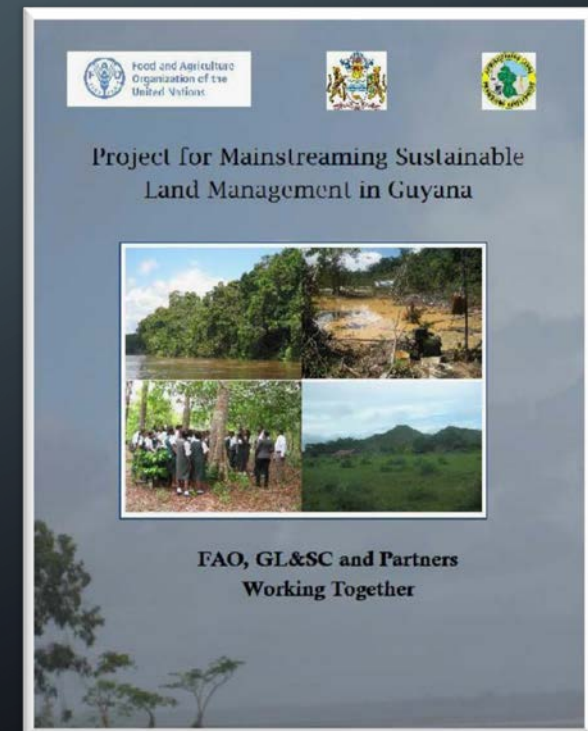
2018- 2021 (4 years)

## Indicative Outcomes

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

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

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





# THE INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK : IMPLEMENTATION IN GUYANA

TOWARDS IMPLEMENTATION OF THE IGIF IN GUYANA





# TOWARDS IGIF IMPLEMENTATION: NATIONAL GEOSPATIAL POLICY

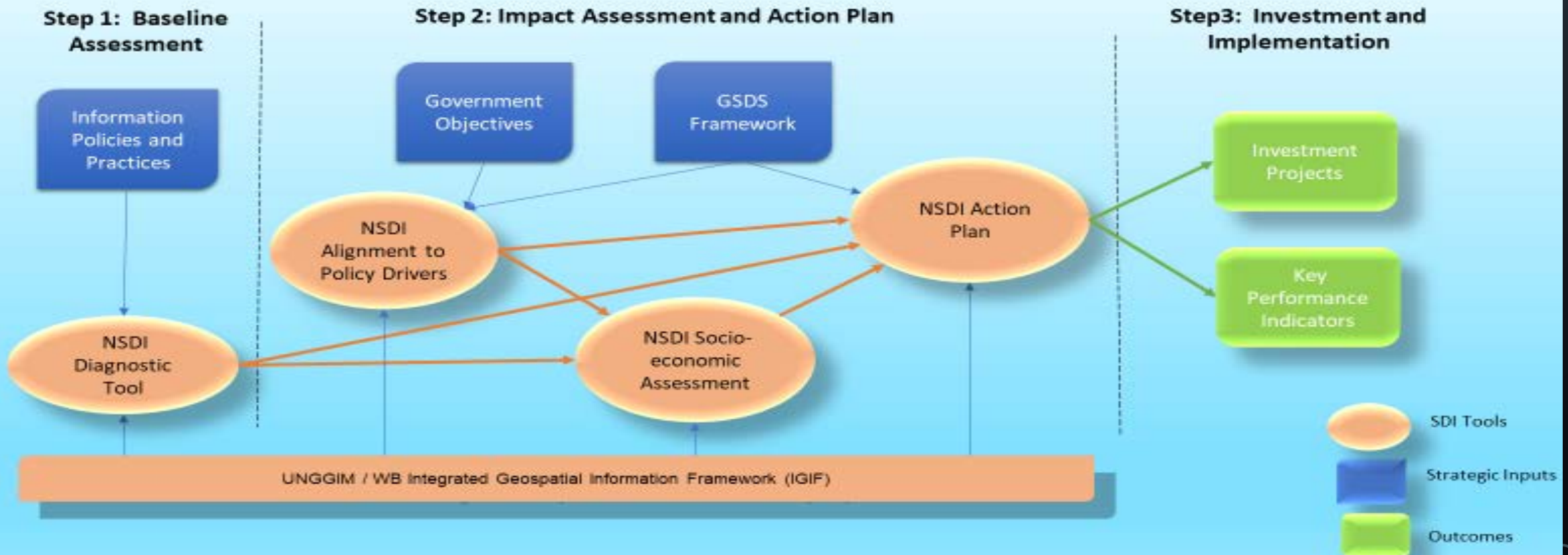
- 5<sup>th</sup> iteration of National GIS Policy was reviewed using the IGIF Overarching Strategic Framework.
- Revised and sent to Government of Guyana Cabinet in January 2019, where it is pending approval.



# TOWARDS IGIF IMPLEMENTATION: NSDI ASSESSMENT METHODOLOGY WITH ACCOMPANYING ANALYTICAL TOOLS

(UNGGIM, WB, UNFAO)

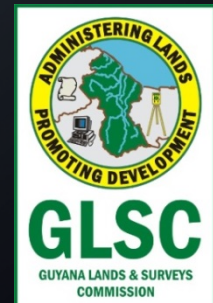
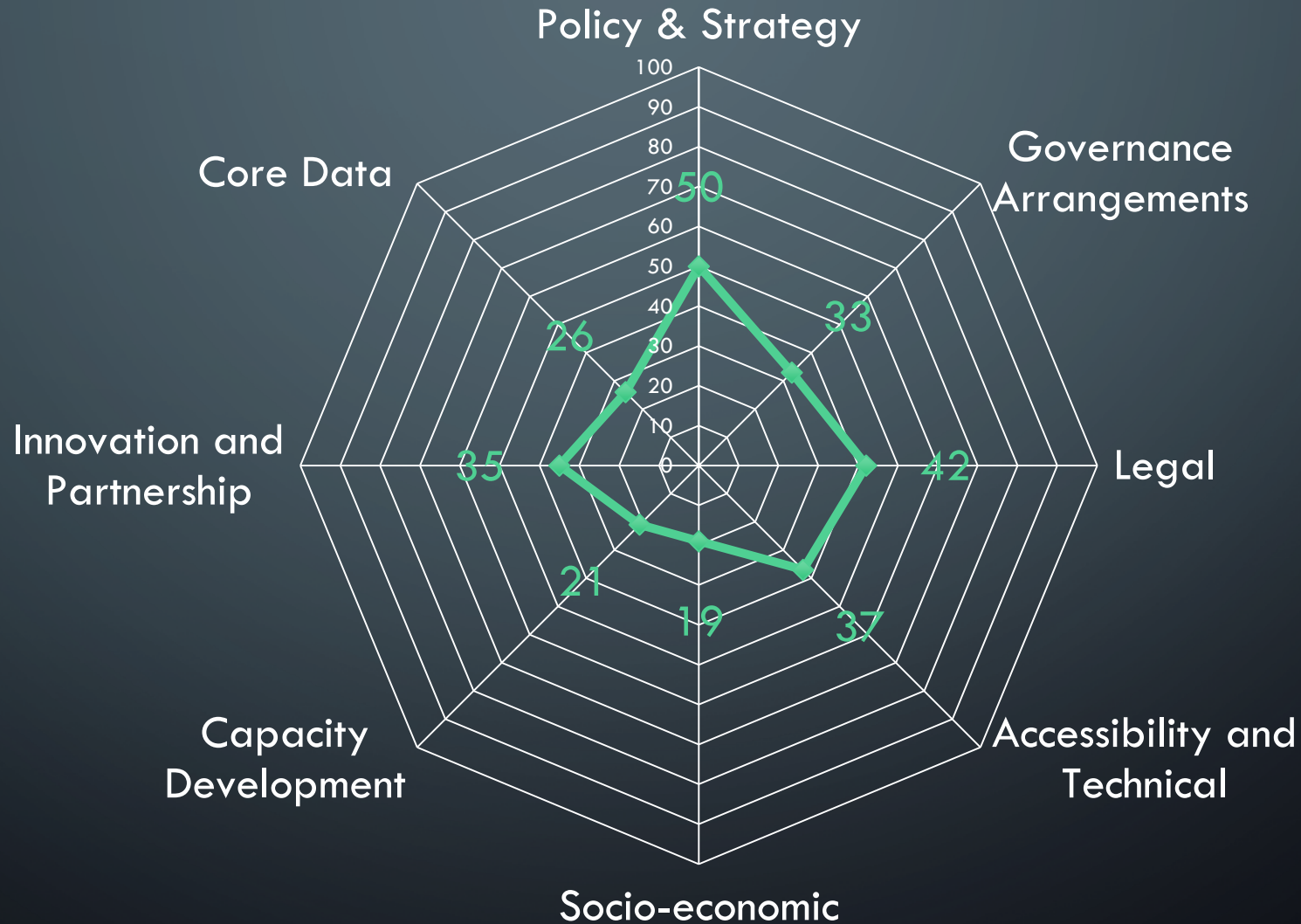
## Methodology



# 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 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)



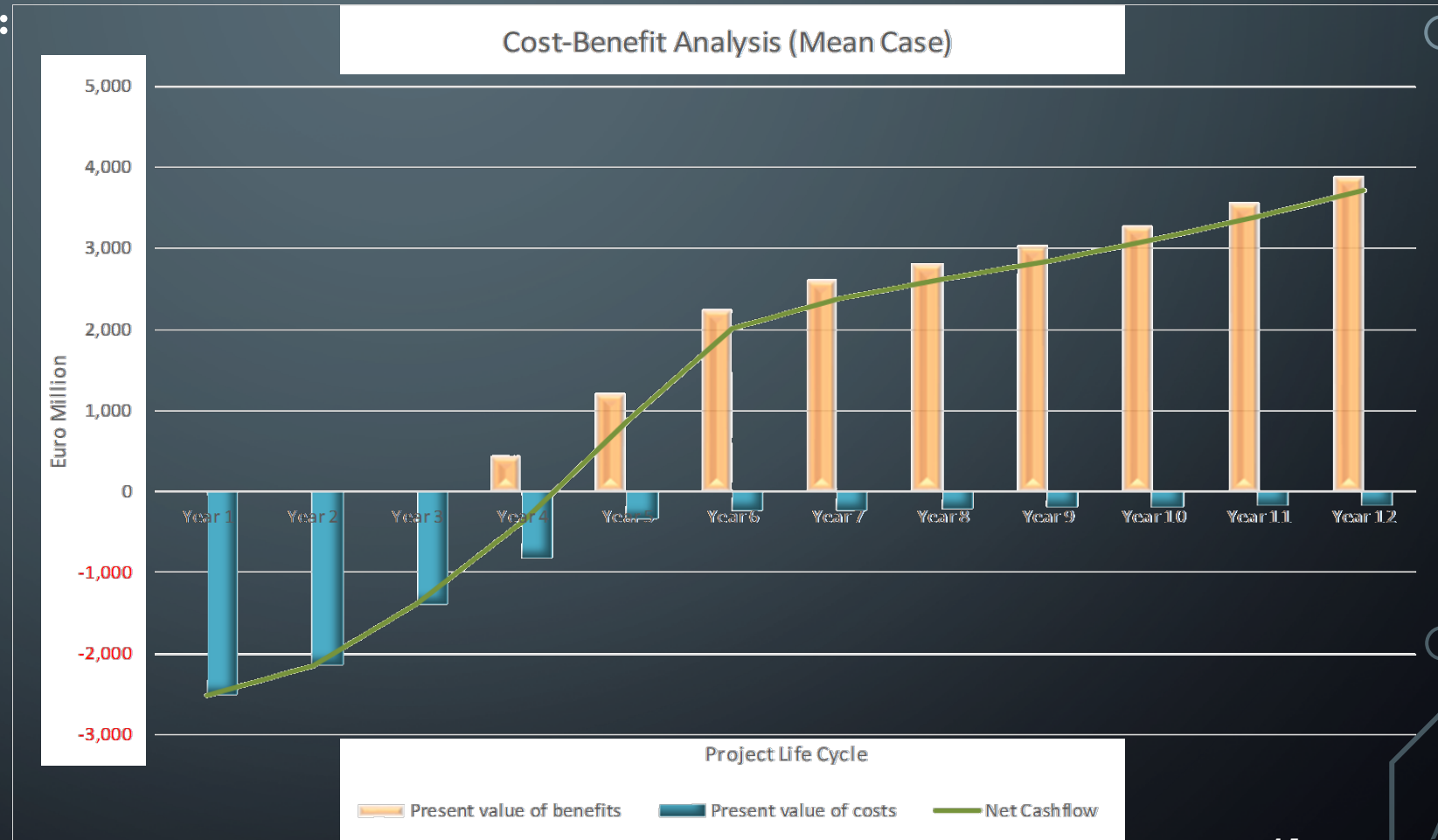
# NSDI SOCIO-ECONOMIC ASSESSMENT: QUANTIFIED MARKET IMPACTS



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

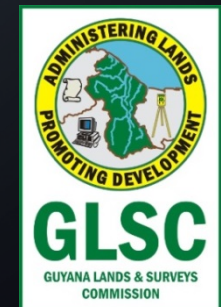
# PROVISIONAL RETURN ON INVESTMENT ANALYSIS

- 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!
- Guyana is one of the first countries globally to start implementing the UNGGIM IGIF

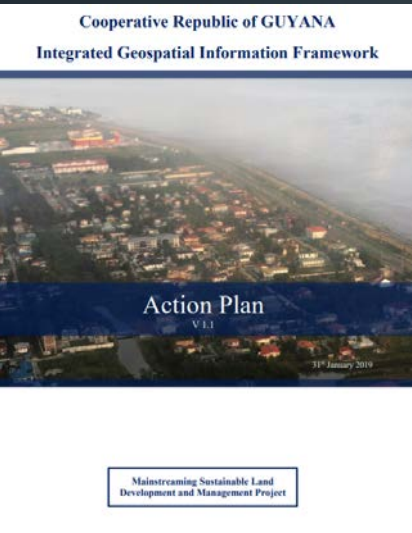
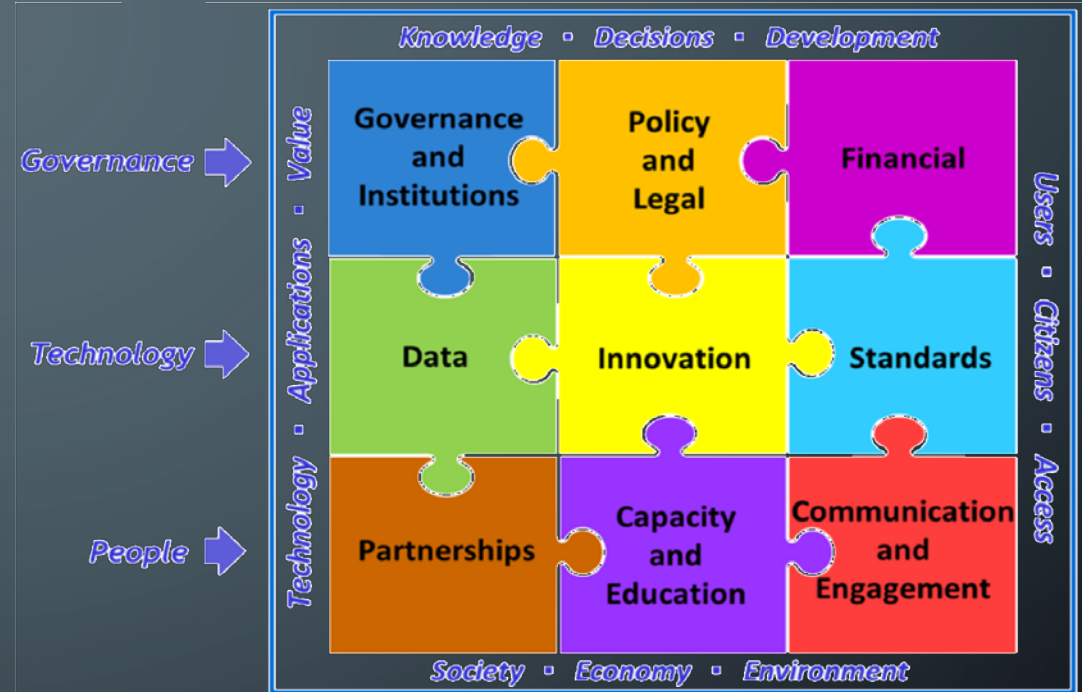
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80 Pages

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# 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.

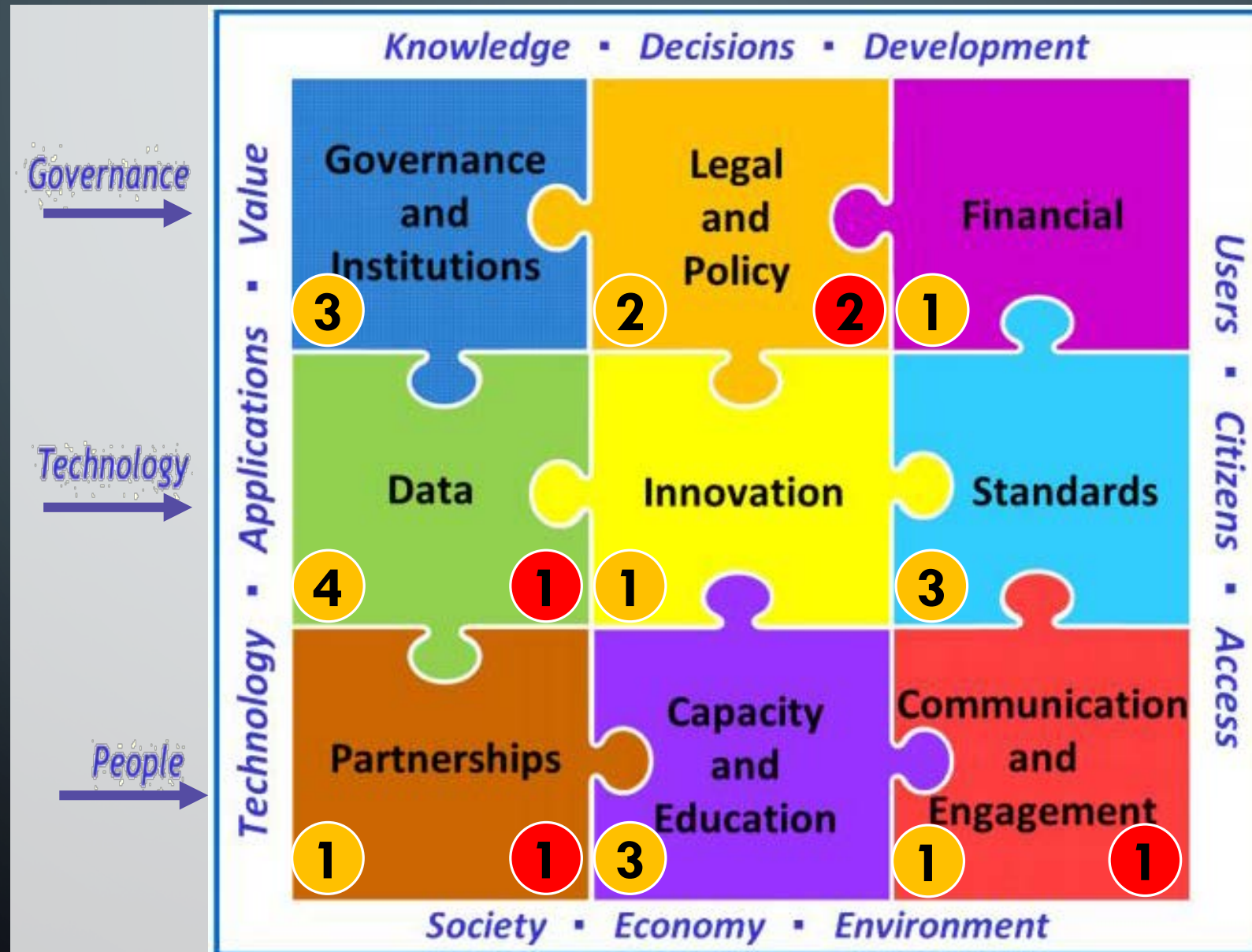




# THE INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK : IMPLEMENTATION IN GUYANA

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 (SEPTEMBER 2019)

## STRATEGIC PATHWAY 1:

### GOVERNANCE & INSTITUTIONS



#### ACTIONS

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

#### KPIs

- 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 Robust 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 agreements in place and regular operational sharing among 5 organisations within 12 months (including National Statistics Bureau).
- ▶ 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)
-  Government long term investment
-  Donor Funding

### KPIs

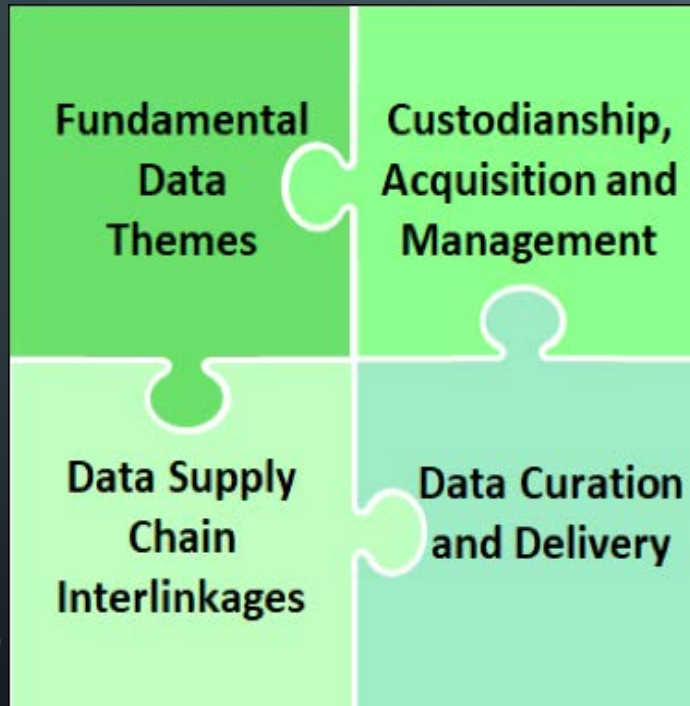
-  Long-term GLSC Business Model approved within 18 months
-  Amount of funding allocated annually
-  Amount of funding secured annually

 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.

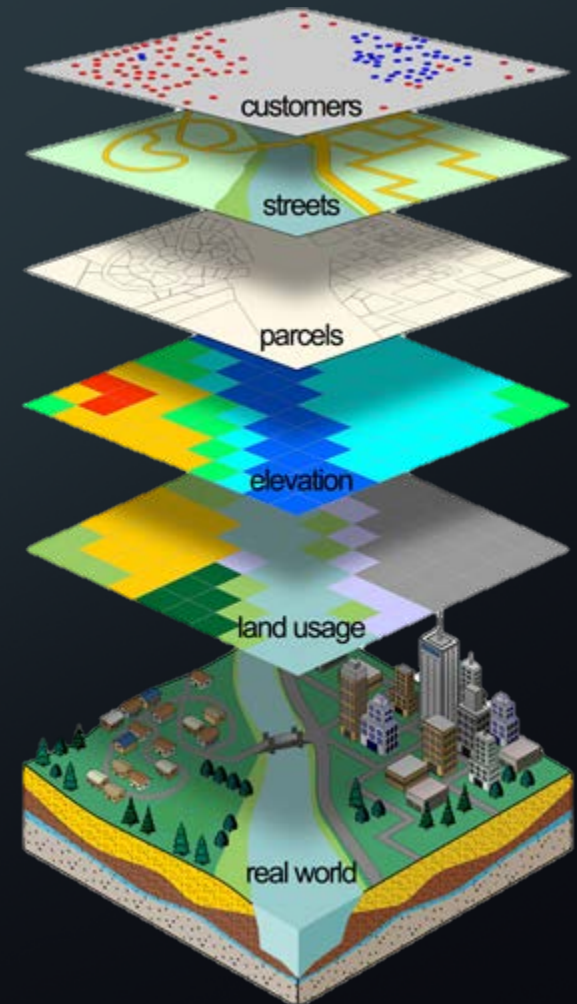
■ COMPLETED ■ IN PROCESS ■ NOT STARTED





# Data Themes Linked to Sustainable Development Goals

	1 No Poverty	2 Zero Hunger	3 Good Health and Well-being	4 Quality Education	5 Gender Equality	6 Clean Water and Sanitation	7 Affordable and Clean Energy	8 Decent Work and Economic Growth	9 Industry, Innovation and Infrastructure	10 Reduced Inequalities	11 Sustainable Cities and Communities	12 Responsible Consumption and Production	13 Climate Action	14 Life Below Water	15 Life on Land	16 Peace, Justice and Strong Institutions	17 Partnerships for the Goals
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		*				*	*	*	*	*	*	*	*	*	*	*	*



# NSDI / IGIF ACTION PLAN: STATUS (SEPTEMBER 2019)

## STRATEGIC PATHWAY 5: INNOVATION



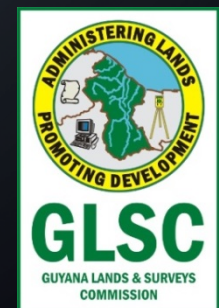
### ACTIONS

■ Centre of Geospatial Information Excellence (High Priority)

### KPIs

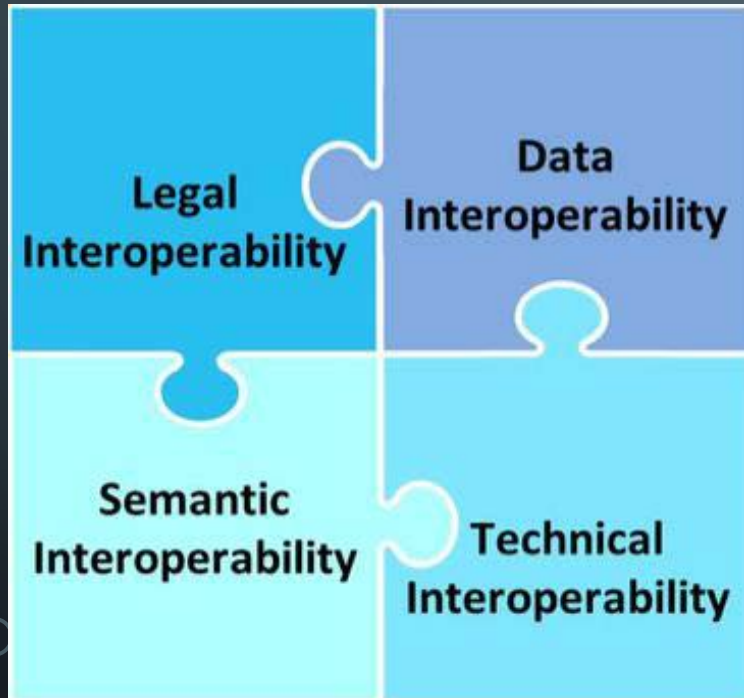
- ▶ Centre of Excellence terms of reference, funding and recruitment plans approved by GAC within 12 months
- ▶ Centre of Excellence fully operational within 2 years.

■ 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

### KPIs

- Define Scope of a Partnership with International NSDI Organisations
 ■ ➤ Study visits to two countries completed within 12 months.
- Support creation of Guyana Association for Geospatial Information
 ■ ➤ Guyana Association of Geospatial Information formed within 2 years
- Partnerships for Capacity Building With UT/Serbia

■ 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

■ COMPLETED ■ IN PROCESS ■ NOT STARTED





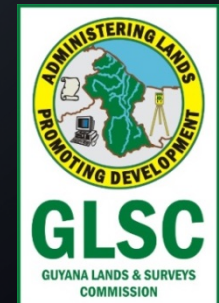
# THE INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK : IMPLEMENTATION IN GUYANA

REFLECTIONS



# REFLECTIONS ON THE IGIF IN GUYANA

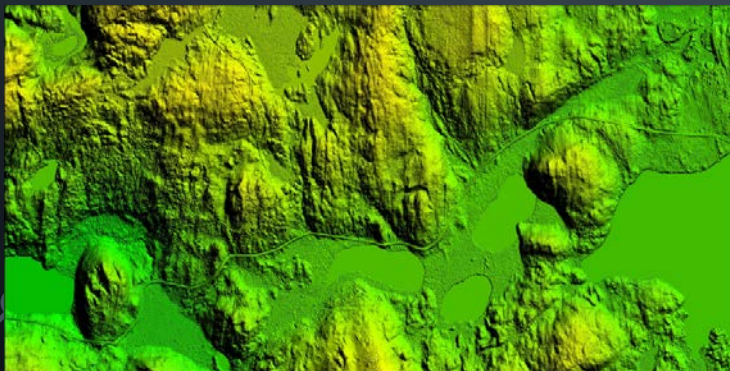
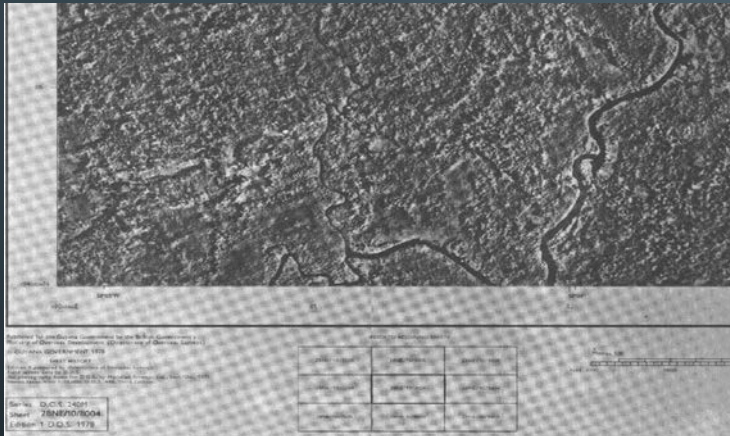
1. Incorporation of IGIF began in Guyana (July 2018 with ECLAC workshop, Sept. 2018 with start of NSDI diagnostic) before and right after formal adoption of IGIF Part 1: Overarching Strategic Framework (August 2018) and without reference to IGIF Part 2: Implementation Guide.
2. IGIF Strategic Framework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



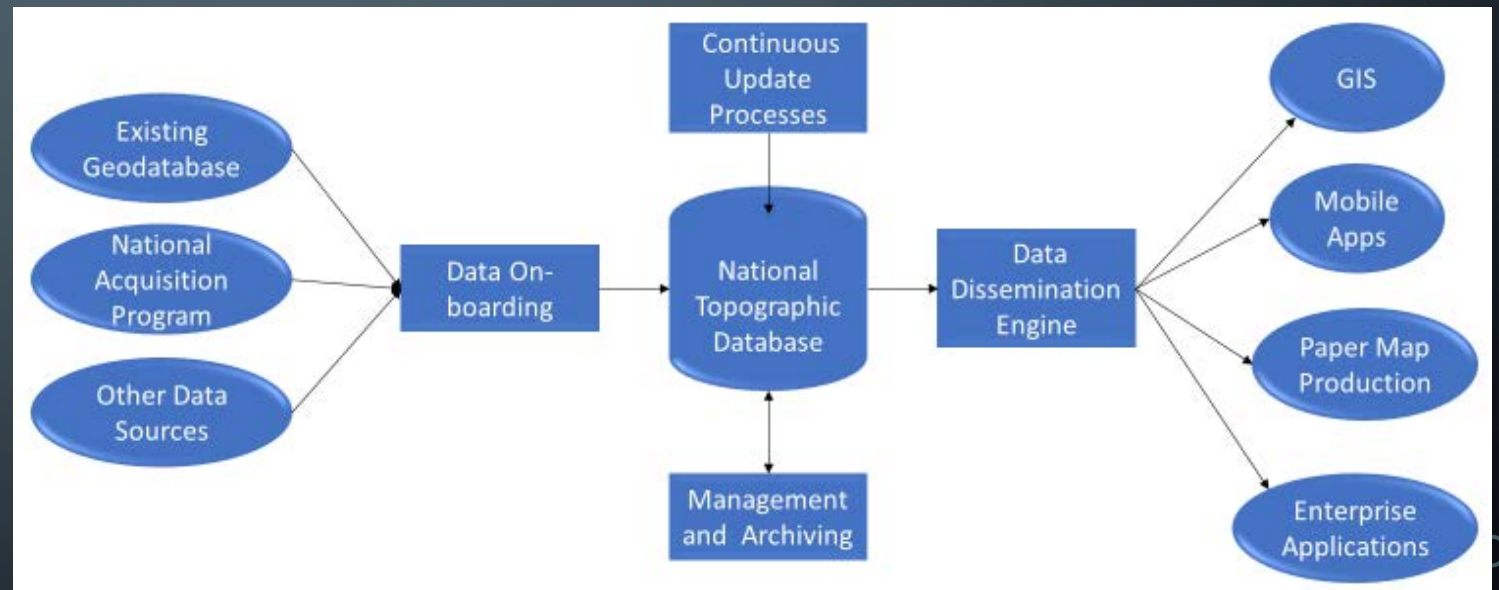


# REFLECTIONS ON THE IGIF IN GUYANA

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 IN 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 data like LiDAR



# REFLECTIONS ON THE IGIF IN GUYANA

5. A convergence of a legally mandated institutional leader (led by a champion Mr. Trevor L. Benn), political support and international partnerships (Norway, FAO, UNGGIM, ECLAC, WB) 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.



# EL FINAL... PREGUNTAS?

Guyana Lands and Surveys Commission

Email: [ceoffice@glsc.gov.gy](mailto:ceoffice@glsc.gov.gy)

Website: <http://www.glsc.gov.gy>

**Kaieteur Falls**



**UN-GGIM:Américas**  
COMITÉ REGIONAL DE LAS  
NACIONES UNIDAS SOBRE  
LA GESTIÓN GLOBAL  
DE INFORMACIÓN GEOESPACIAL  
PARA LAS AMÉRICAS