Future national geospatial agencies: shaping their contribution to society and the sustainable development goals

JOHN KEDAR, JAMES DARVILL, VICTORIA GIDDINGS, KIMBERLEY WORTHY

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‘The potential economic value of this [geospatial] data is huge.

To maximise the growth of the digital economy…the government will establish a new Geospatial Commission to provide strategic oversight…. ’

UK Government budget statement
22 Nov 2017

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Agenda

- Illustrating the benefits of GI to SDGs.
    - Why is data important to SDGs?
    - Which SDGs
    - Measuring the Benefits
- Developing National Mapping/Geospatial Agencies and capabilities
    - Traditional Mapping Agency Role
    - What is the future?
    - Overcoming some strategic challenges
- Conclusion
    - Do national mapping agencies have a future?

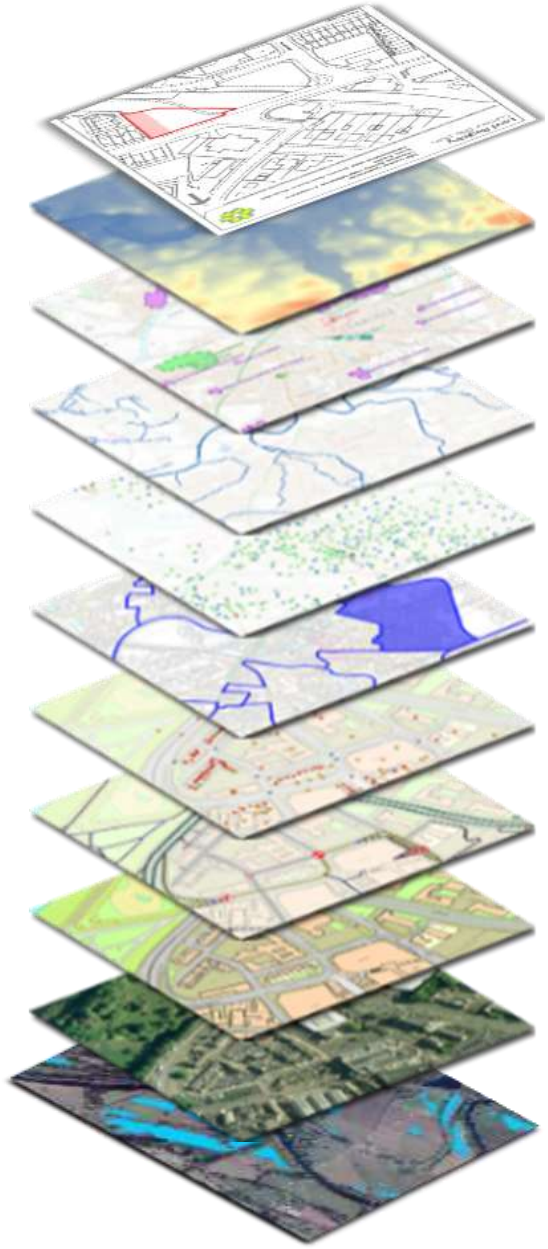
‘*Data are an infrastructural resource – a form of capital that cannot be depleted and that can be used for a theoretically unlimited range of purposes*.’

Organisation for Economic Cooperation and Development (OECD) , 2015

Available | Accessible | Useable

Fit for Purpose (content, currency & accuracy) | Trusted

Create once, use many



- Geographical Names
- Addresses
- Functional Area
- Settlements
- Land Parcels
- Transport Networks
- Elevation/Depth
- Population Distribution
- Land Cover/Use
- Geology/Soils
- Physical Infrastructure
- Imagery
- Water

Location information is important to nations

Geography is the stage on which all natural and human activity occurs.

- Land administration and registration
- Business
- Infrastructure planning including telecoms, rail and metro
- Transport planning and operations
- Resilience planning, Disaster response
- Defence, Safety and security
- Health planning and delivery
- Emergency Response
- Environmental management and climate change
- Resource and Asset management
- Transparency and eGovernment services
- Revenue generation
- Smart Cities
- Enabling automation, connectivity, IoT ……

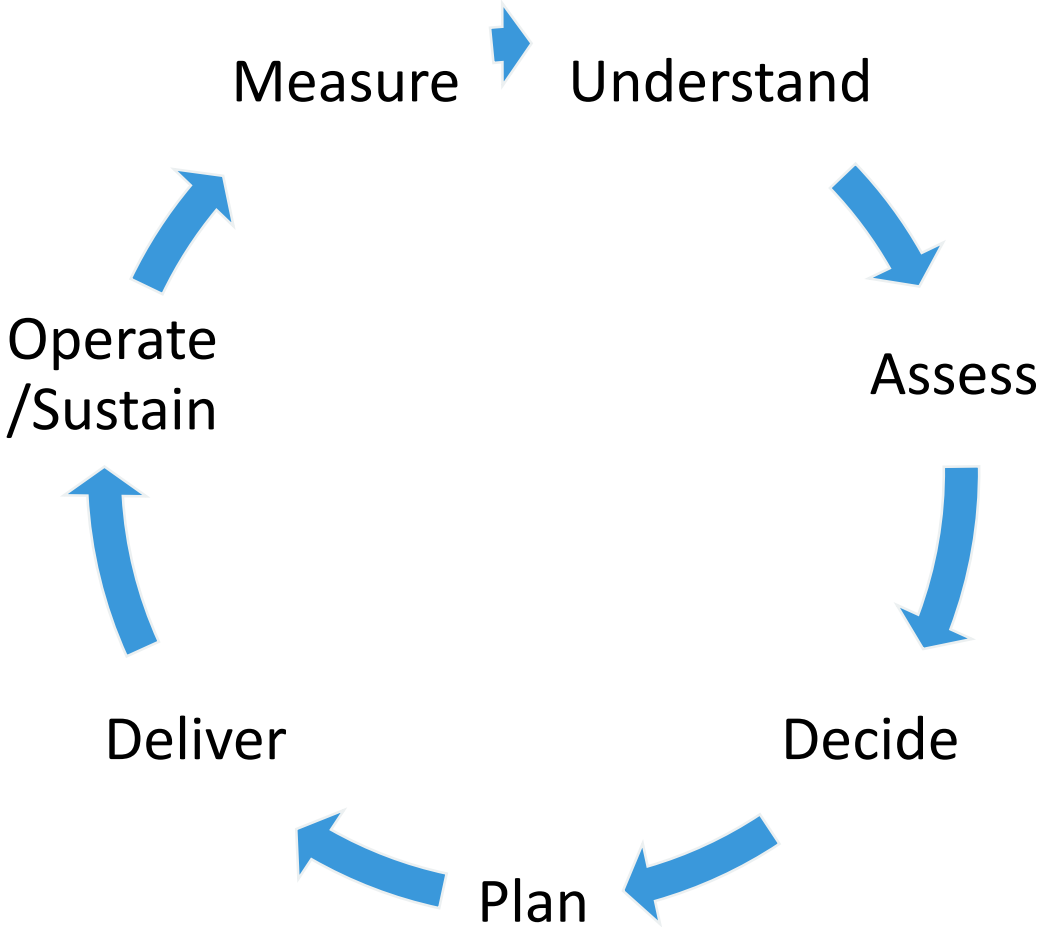
"In Namibia a country in which water is a scarce resource…spatial data is only below water in significance"

Minister Alpheus G. !Naruseb
Minister of Lands & Resettlement
Namibia, 2013

Why? Be country specific: Tanzania challenges that GI can help overcome

- Health and education analysis and planning
- Clean water and sanitation
- Transport planning and efficiency in logistics
- Improving traffic flows and reducing air pollution
- Controlling development and managing Land use tensions
- Natural resources management
- Elections and administration
- Land tenure and investment
- Census and statistics
- Integrated Urban Planning, improving city environment and managing informal settlements
- Citizen services
- Disaster response/rescue services
- Taxation: property, business, personal
- Physical Infrastructure protection, asset management

Delivering the Sustainable Development Goals (SDG)



The economic contribution (Goals 8, 9)

Year	Study	Relates to:	Country	GDP impact
2008	ACIL Tasman	Impact of modern spatial information technologies	Australia	0.6-1.2%
2008	ACIL Tasman, SKM & Ecological Associates	GI contribution to productivity	New Zealand	0.6%
2010	ConsultingWhere	7 Public Sector Services Productivity Related benefits	UK Public Sector	0.23%
2011	ACIL Tasman, Lester Franks & ConsultingWhere	Total change in real Gross State Product (GSP) due to productivity increase due to spatial information.	Tasmania State, Australia	0.4%
2011	GeoBusiness Nederland	Government, private and research sectors using GI	Netherlands	0.25%
2012	Richard Zerbe and Associates	Net benefit of GIS alone	King County, Washington	0.09%
2012	Boston Consulting Group	Geospatial Industry (including remote sensing satellites)	USA	0.5%
2013	Oxera	Geospatial Industry as % of GDP	Global	0.2%
2014	Indecon	GI Contribution to the economy	Ireland	0.33%
2015	Hickling Arthurs Low, Acil Allen Consulting, Fujitsu & ConsultingWhere	Contribution of geospatial industries and GI to GDP	Canada	1.1%

Security of land tenure underpins development (Goals 1, 5 and 10)

- Land is 75% of the value of world GDP
- Enable effective infrastructure planning and delivery
- Access to credit and tenure security
- Fair compensation
- Land tax

Esperance, 39, a mother of four used to be in constant dispute with her neighbours over ownership of the land she lived on. Through a DFID-funded land registration programme, the dispute is now settled and she is a proud landowner.

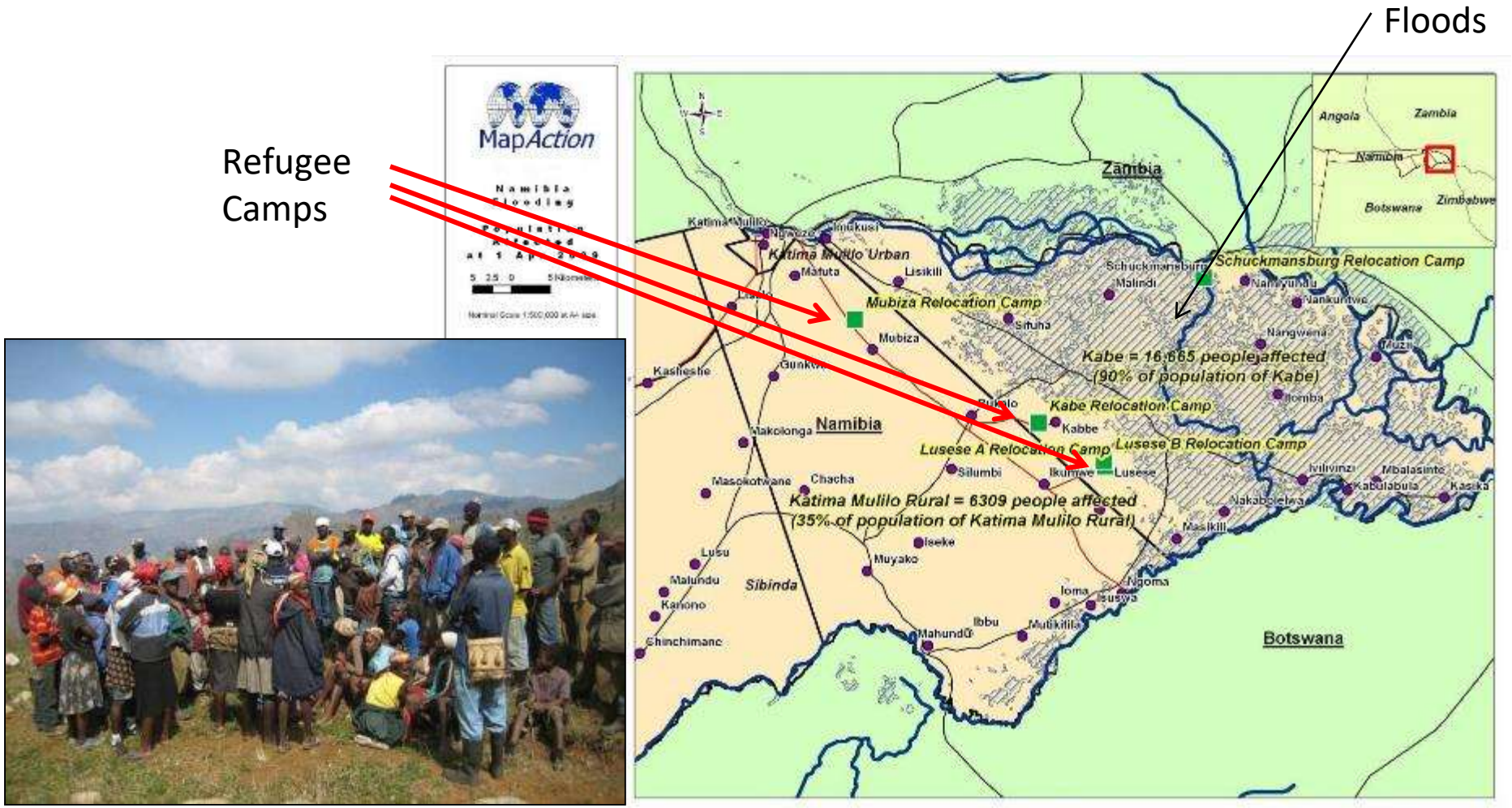
Urban Development (Goals 2, 4, 6, 9, 11)

- Improved Urban Planning
- Resilience planning & disaster response
- Environmental management
- Transport planning and operations
- Health and education outcomes
- Land tenure
- Business logistics and planning
- Revenue generation (tax)

Rural Development and Agriculture (Goals 2, 12, 14 and 14)

- Agricultural cadastre
- Calculation of farming subsidy or compensation payments
- Irrigation and drainage planning and maintenance
- Land use planning
- Products to market – road infrastructure
- Environmental protection
- Large-Scale Agricultural Investments
- Rural Development

Disaster response

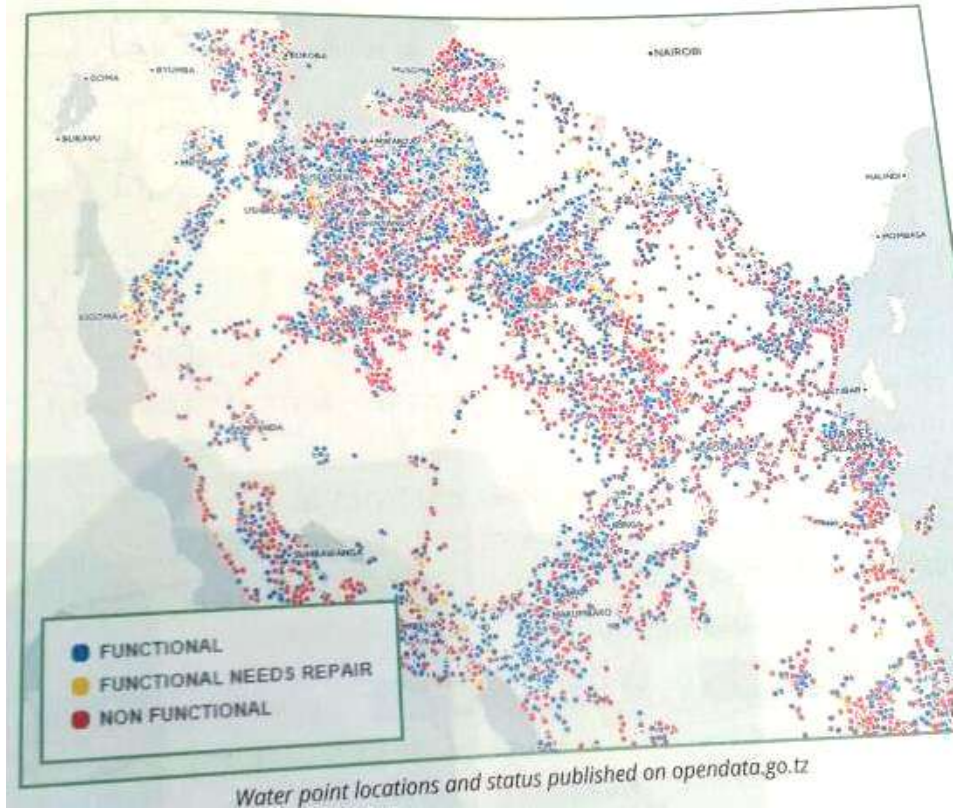


Water and Schools (Goals 2, 4,5, 6, 9)

Access to clean water
Sustainable supplies

Access to education
Transport for education: Kenya,

Tanzania Policy: 1991 Policy on Water states that everyone should have access to clean water within 400m of their home.



Addis Ababa's Resilience Challenge (Goal 11)

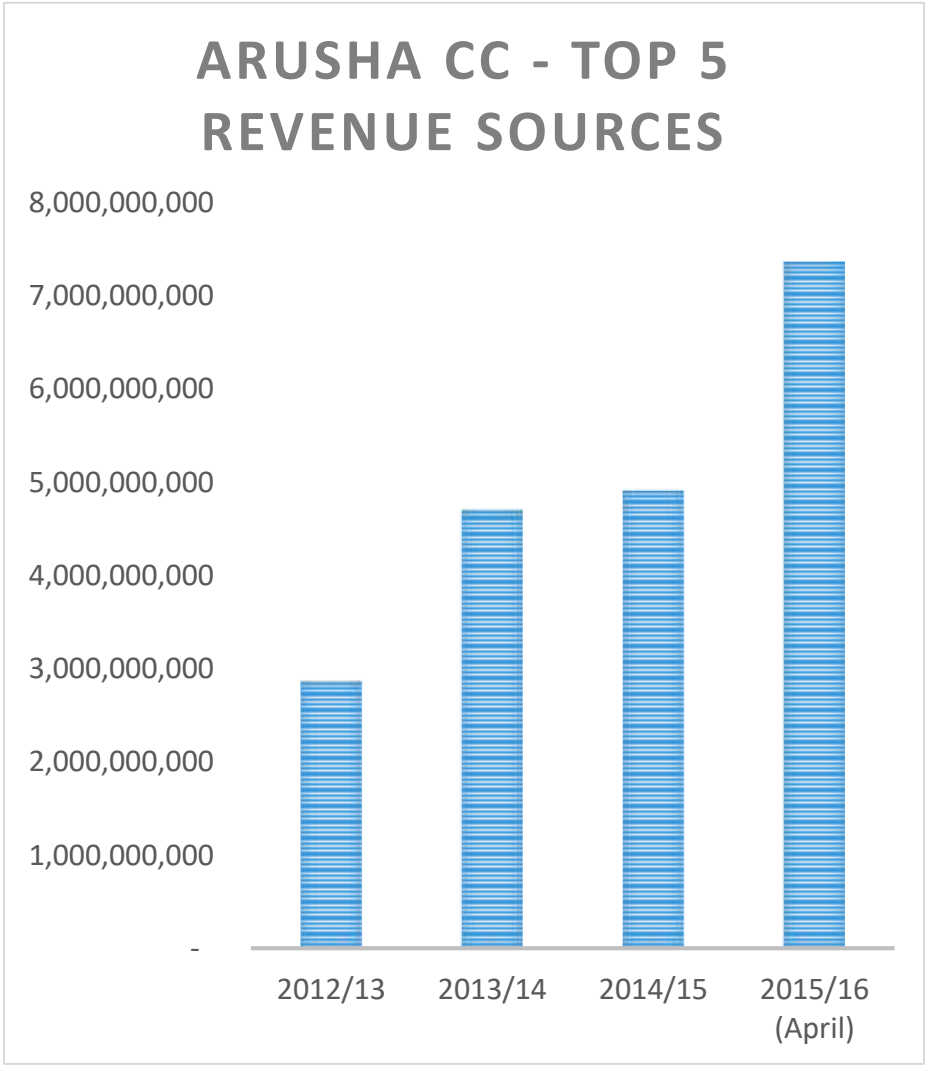
Raise living standards in the face of rapidly growing population.

- City on pace to double in size within 15 years
- Strain on existing public services, especially clean water and sanitation.
- Recent measures to increase resilience:
  - BRT line to alleviate urban congestion
  - Public work programs to address an unemployment rate above 22%.
- Fire

http://www.100resilientcities.org/cities/addis-ababa/ Ordnance Survey is a Rockefeller 100 Resilient Cities partner

Revenue Example: Arusha Local Government Revenues (Goals 10 and 12)

- Service levy, property tax, billboards, parking fees, income from sale or rent, market fees and charges, secondary school fee etc.
- Local Government Revenue Collection Information System: Geographically locate all taxpayers and properties
- Comprehensive spatial database: satellite imagery, roads and individual buildings digitised, unique property reference number, attributes (e.g. use, condition, age)



World Bank Land and Property Conference 2017. The role of ICT in delivering efficient revenue collection in developing countries: The Tanzanian experience. Prof William McCluskey, African Tax Institute, University of Pretoria, Chyi-Yun Huang, World Bank, Patrick Doherty, Consultant, Prof Riel Franzsen, African Tax Institute, University of Pretoria

Example: Zanzibar Coastal Development: land and the environment (Goals 8, 13, 14, 15)

- Sustainable Tourism
- Property rights
- Unregulated or illegal development
- Environment
- ‘Blue’ economy
- Infrastructure development

SDG and INSPIRE data themes

INSPIRE Theme	Sustainable Development Goal												
	1	2	3	5	6	7	8	9	11	12	13	14	15
Address	■	■	■	■	■	■	■	■	■	■	■	■	■
Administrative units	■	■	■	■	■	■	■	■	■	■	■	■	■
Cadastral parcels	■	■	■	■	■	■	■	■	■	■	■	■	■
Geographical Names	■	■	■	■	■	■	■	■	■	■	■	■	■
Hydrography		■	▒		■			▒	■	■	■	■	■
Transport networks (road, rail, water, air, cable)	■	■	■					■	■	■	■	▒	
Protected sites							■		■	■		■	■
Elevation								▒	■	■	▒	■	■
Land cover		▒			■		▒	▒	■	■	▒		■
Ortho-Imagery		▒			▒		▒		■	■	■	■	■
Geology	▒		▒		■				■				
Buildings	▒						▒	■	■		▒		
Land use (existing , planned)	■	■	▒	▒	■	▒	▒	■	■	■	■		■
Soils		■	▒		▒		▒		▒				■
Human health	▒	▒	■		■		▒		■	■			
Governmental services and utilities	■	▒	■	■	■	■	▒	▒	■	■	■	■	
Environmental Monitoring facilities	▒				▒				▒	■	▒	■	▒
Production facilities			■		■	▒	■	▒		■	■	▒	
Agricultural facilities		■			■	▒	▒	▒		▒	▒	■	▒
Population distribution/ Statistical Units	■	■	■	■	■	■	▒	■	■	■	■	▒	
Area management - Regulated areas					■				▒	▒	▒	■	■
Natural risk zones	■	▒					▒		■	■	■		▒
Sea regions												■	
Oceanographic features			▒						▒			■	
Atmospheric conditions – meteorologic features	▒		■				▒		■			■	▒
Biogeographical regions							▒						▒
Habitats and biotope							▒		■	■		■	■
Species distribution		■					▒		■	■		■	■
Energy resources	■	▒				■	■	▒	▒	■			
Mineral resources							■	▒		■			

Measurement - Canada

States within a Nation are different – so too are nations

	Atlantic	Quebec	Ontario	Canada
	%	%	%	%
Agriculture, forestry, fishing and hunting	2.50	1.04	1.33	1.22
Mining, quarrying, and oil and gas extraction	3.32	4.44	4.67	4.54
Utilities	1.60	1.73	1.68	1.58
Construction	1.34	0.94	0.82	1.23
Manufacturing	0.16	0.57	0.30	0.33

Hickling Arthurs Lown2015

Estimated percentage change in industry output as a result of geospatial information

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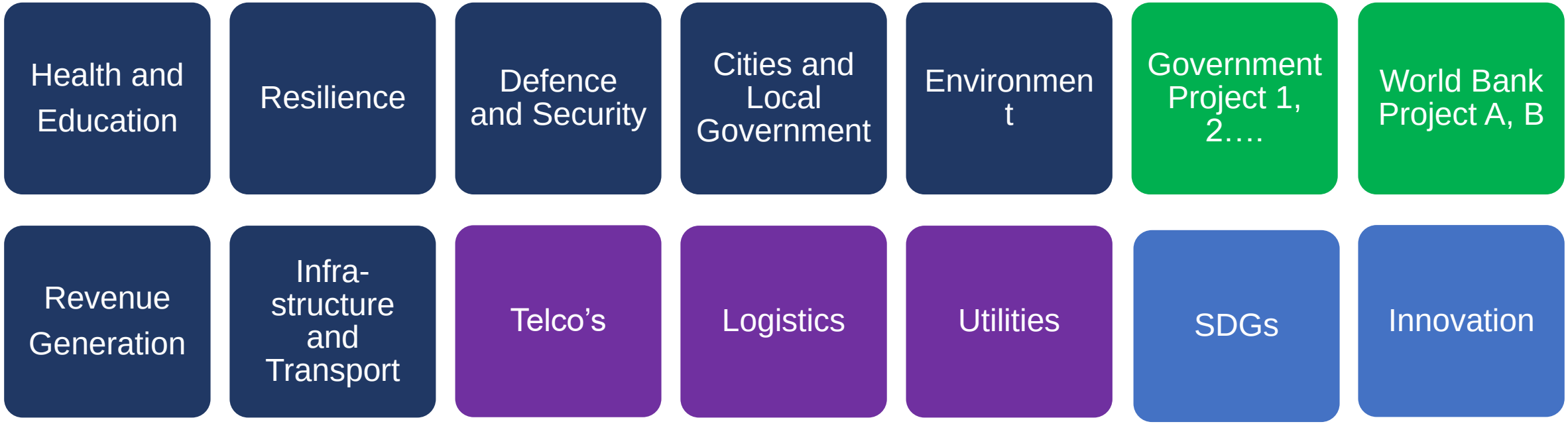
Digital geospatial information could enhance Ghana GDP by US$75–US$200m pa

HEALTH WARNING – THESE ARE HIGH INCOME NATION STUDIES, EVERY NATION WILL BE DIFFERENT

The strategic funding challenge? Collect once use many



Ordnance Survey 2016.

All enabled by the same physical and digital data infrastructures

"It is not a project BUT a national infrastructure"

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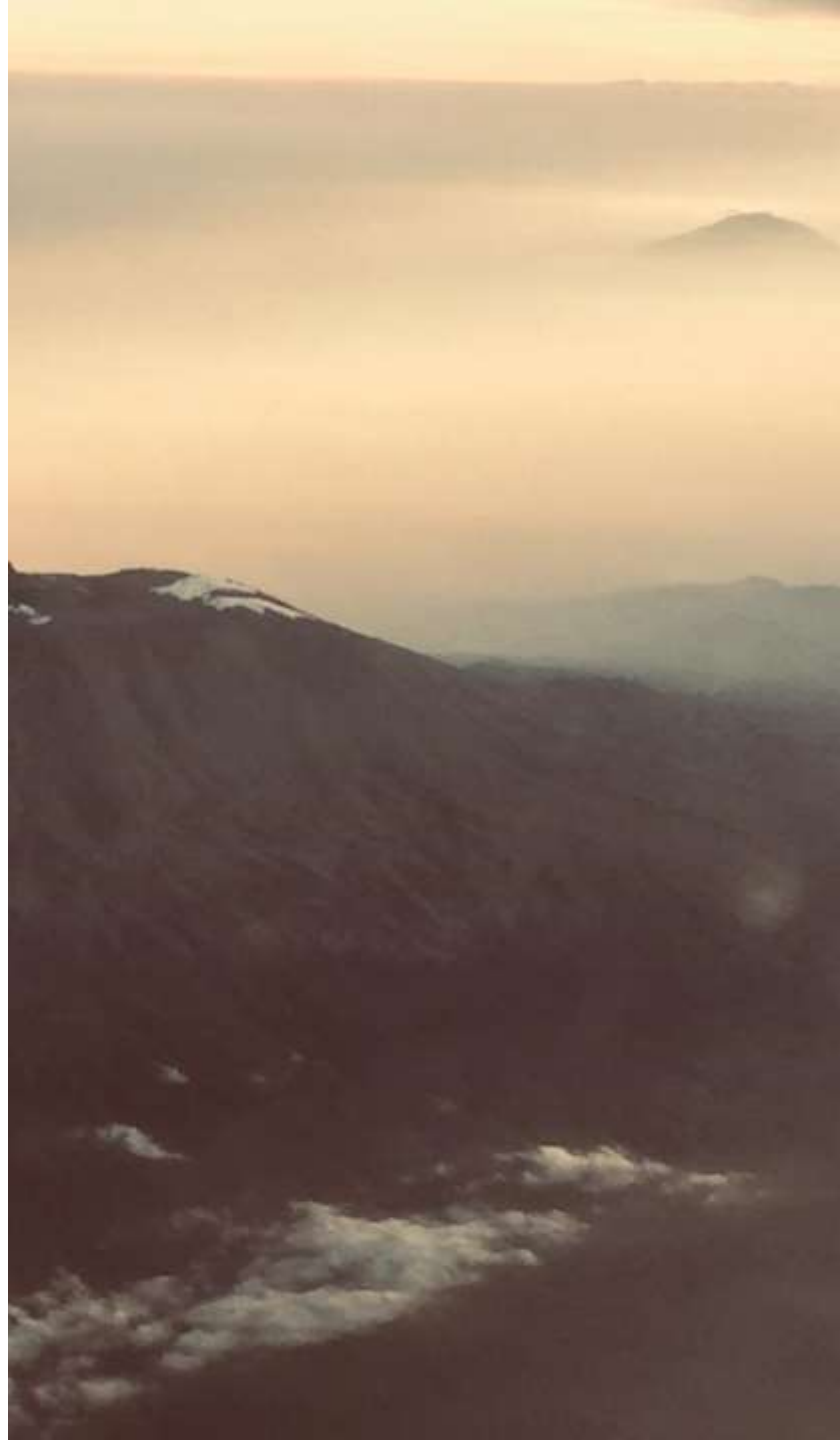
Some Challenges for NMGAs

- IoT, automation, 4th Industrial Revolution
- Maintenance – currency, accuracy, detail.
- Large amounts of raw data are available. This data needs to be ‘processed/managed’ to be actionable.
- Pace of change in geospatial technologies.
- Competition – Crowd, Google etc, other government agencies: all can bypass national mapping agencies.
- Public task v open data v commercial business.
- Access to political and fiscal investment.
- Capacity to change

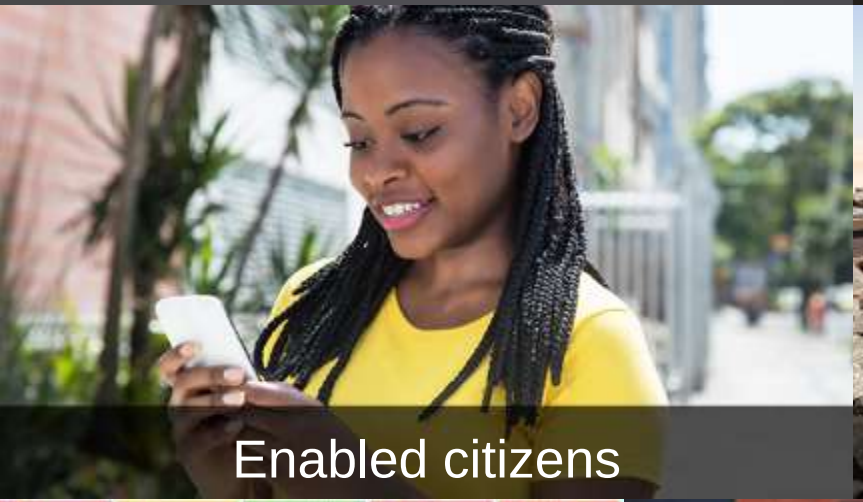


"A politician is not interested in doing things that have no societal impact“ (Governor of Vihiga County, Kenya)

Effective government and taxation

Economic growth/digital economy

Efficiency gains



Enabled citizens

Effective infrastructures and cities

Security and protection of resources

SDG delivery/measurement

Water and health

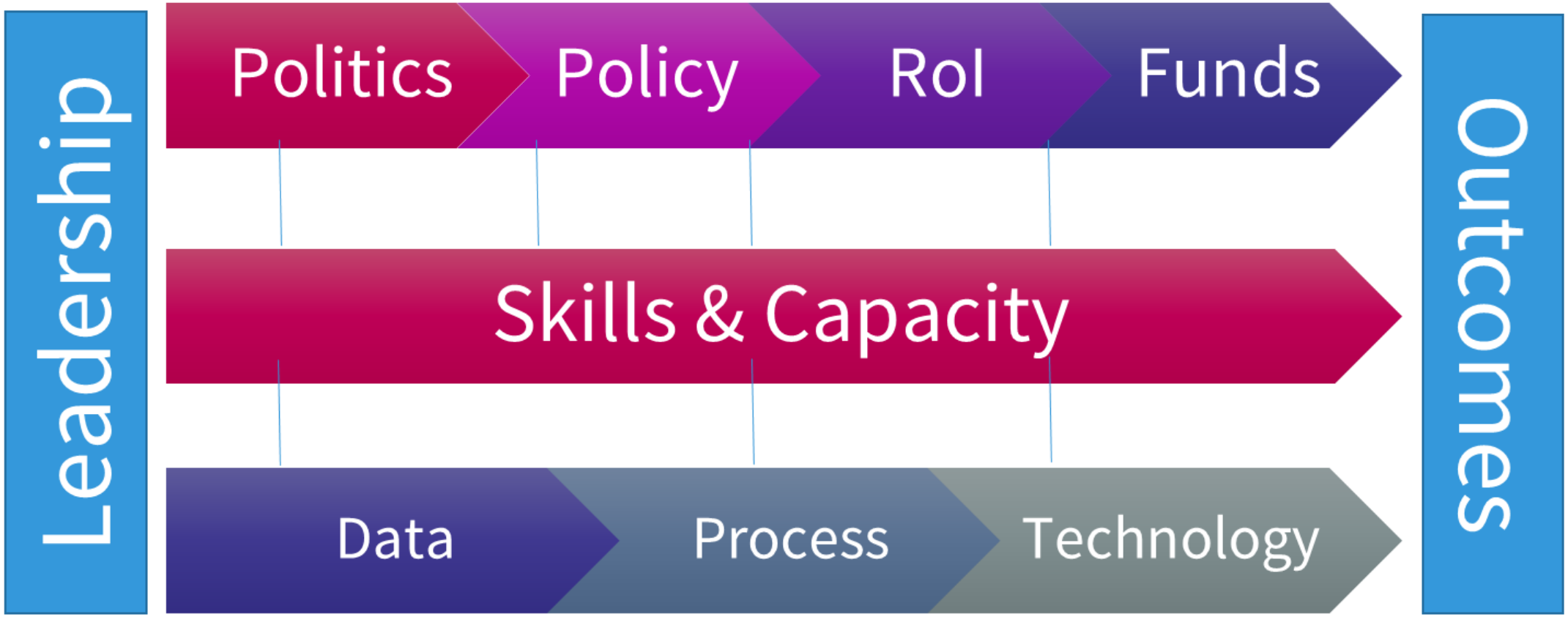
Disaster response

Managing

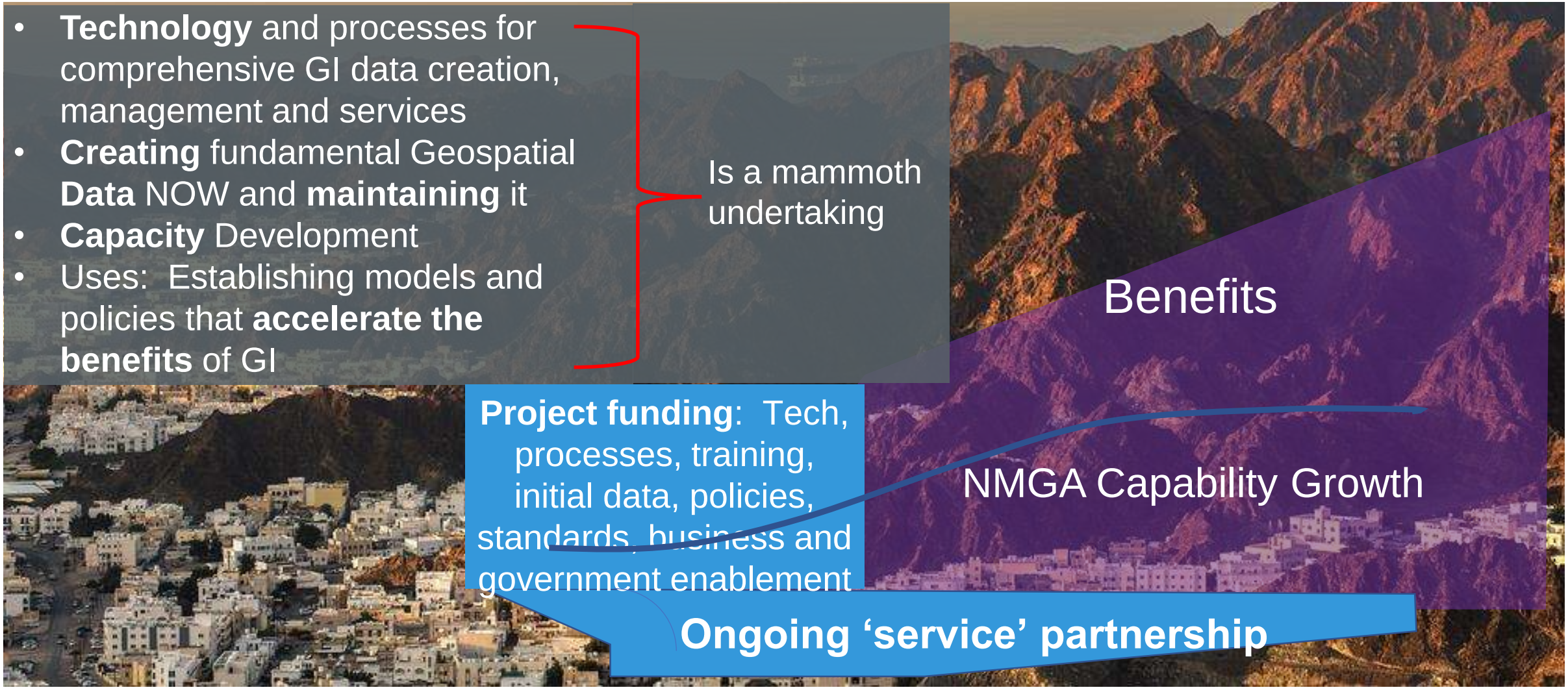
Winning the Arguments

- Communication is vital in the coming years.
- Addressing sustainable development, through the lens of the UN Sustainable Development Goals.
- National ‘ROI’
- Local appropriation of simple, practical and tangible use cases.
- Understanding the political drivers of a government offers the opportunity to approach geospatial matters in an accessible way, presenting the relevance of NMGAs.
- Assuaging fear of technological and behavioural ‘risk’

Capacity to change - the platform for progress ?



Organisational Transformation takes time……
…….yet data required immediately



- **Technology** and processes for comprehensive GI data creation, management and services
- **Creating** fundamental Geospatial **Data** NOW and **maintaining** it
- **Capacity** Development
- Uses: Establishing models and policies that **accelerate the benefits** of GI

Is a mammoth undertaking

Benefits

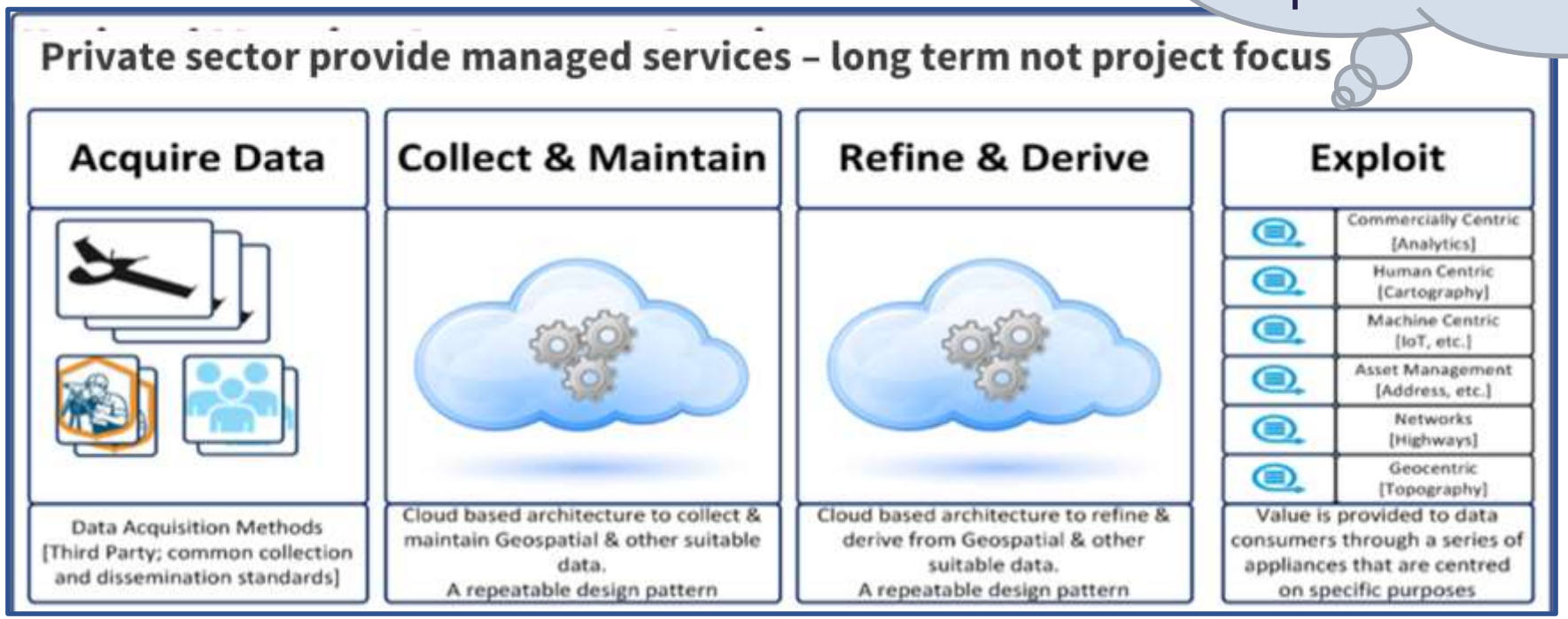
NMGA Capability Growth

Project funding: Tech, processes, training, initial data, policies, standards, business and government enablement

Ongoing 'service' partnership

Transforming operations with help of managed services

Where will capital, capacity development or aversion to technical risk impact transformation?



Managed services complement an organisational transformation whilst delivering data today

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Conclusion: Do NMGAs have a future?

- Increasing reliance on location is an opportunity. SDGs need GI.
- Culture of data sharing and collaboration
- Become the ‘go to’ authorities for fundamental geospatial data - authoritative, trustworthy and widely accessible.
- Lead the ecosystem of data providers
- Data brokers as well as collectors, managers, SDI authorities, service providers/service consumers.
- Be close to customers; focus on citizen’s needs.
- Assist users gain value and solve their problems
- Capacity building v pace of technology change. Can partnerships/managed services help?

Yes, but change is essential

Cambridge Conference

Thank You

John Kedar
Director International Engagement
Ordnance Survey
john.kedar@os.uk