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Economics and the UN – Integrated Geospatial Information Framework (UN- IGIF)

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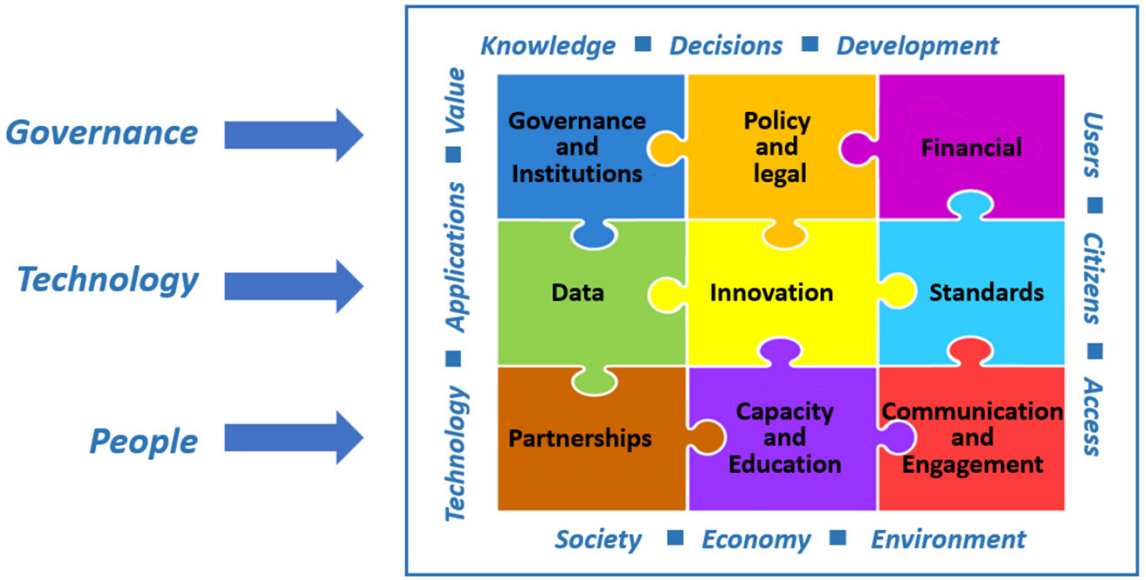
The primary objective of the UN-IGIF is to develop geospatial information management strategies and Country Level Action Plans that support National Spatial Data Infrastructure (NSDI) development and UN-IGIF implementation.

This paper discusses financing and ecomomic issues pertinant to implementation of the IGIF that are also relevant to Small Island Developing States

Background to the UN-IGIF

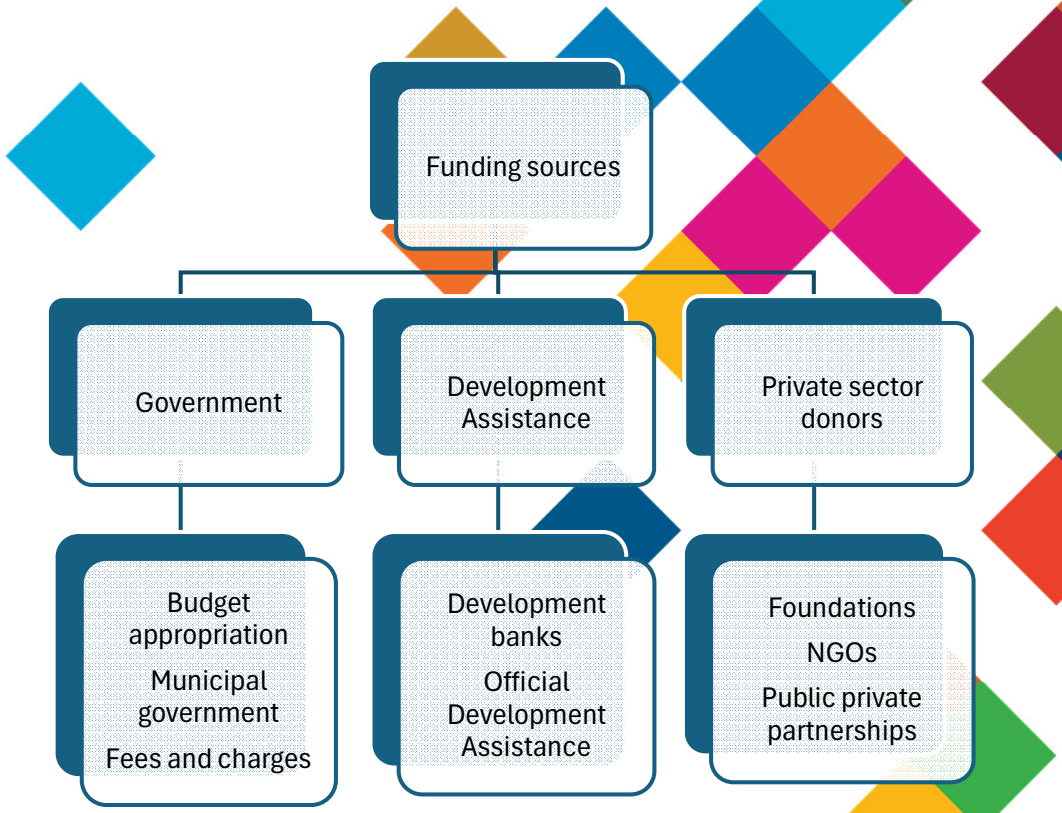
- August 2018 the UN adopted UN-IGIF
  - provide comprehensive guidance to Member States on developing and strengthening geospatial information management to drive sustainable development
- High Level Group of the UN-IGIF established a Sustainable Funding Working Group to assist Member States mobilise sustainable funding to implement the UN-IGIF
- Developing a Funding Guide to assist states with economic and funding issues.

UN-IGIF Strategic Framework



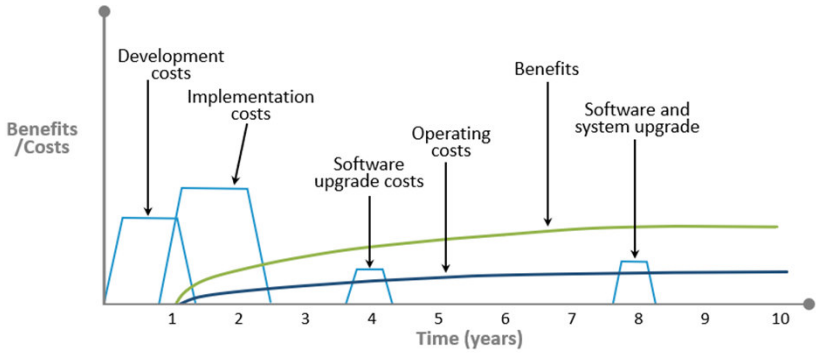
Funding sources

- Funding from in country resources can be challenging for many countries
- There is growing recognition of the importance of geospatial information infrastructure and services this does not necessarily translate into funding priorities
- Most funding sources need a strong socio-economic case before considering funding.
- Sometimes funding can be nested in other priorities such as environmental and climate change programs



Cost Benefit Analysis

- An essential component of a business case
- Aim is the assess whether the value or benefits exceed the costs over a time period.
- Generate a time series of benefits and costs
- Use a discount rate to bring future values to a common date



Discount rate (r)
$=$ ***social opportunity cost of capital***

(the time value of money)

$$\textbf{Net present value } NPV = \textbf{PV benefits} - \textbf{PV costs}$$

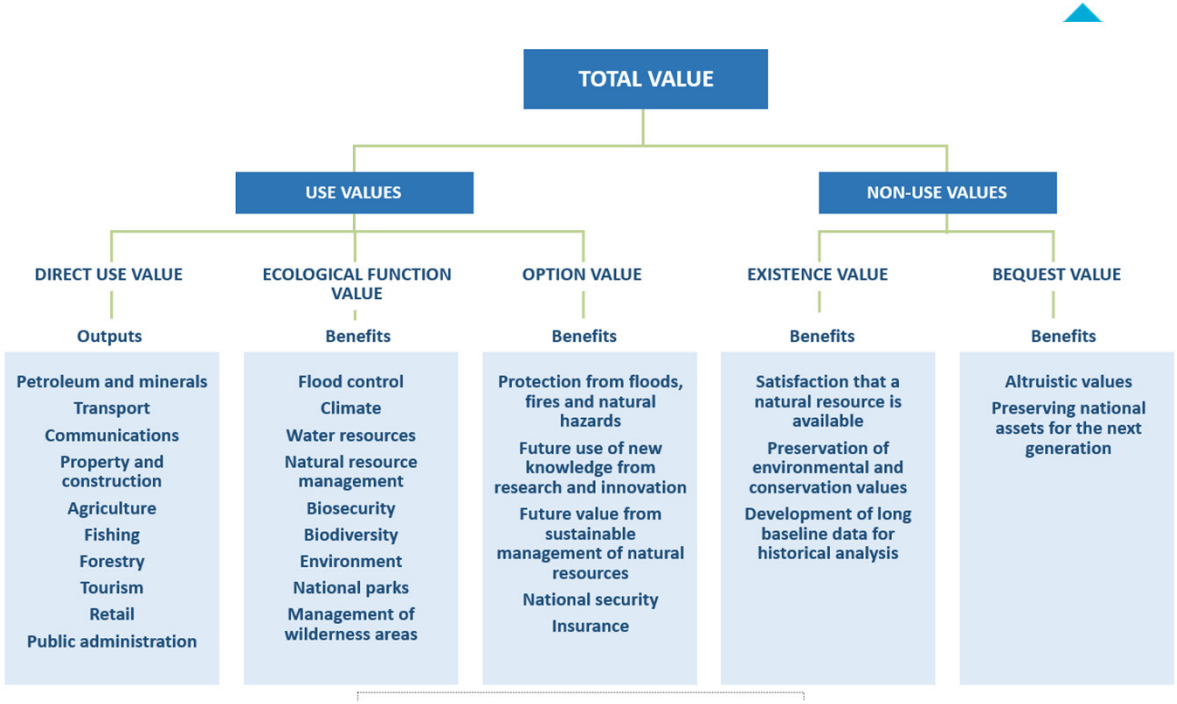
$$= \sum_1^n \frac{B(t)}{(1+r)^{(n-1)}} - \sum_1^n \frac{C(t)}{(1+r)^{(n-1)}}$$

$$\textbf{Benefit cost ratio} = \frac{\textbf{PV benefits}}{\textbf{PV costs}}$$

$$= \sum_1^n \frac{B(t)}{(1+r)^{(n-1)}} \Big/ \sum_1^n \frac{C(t)}{(1+r)^{(n-1)}}$$

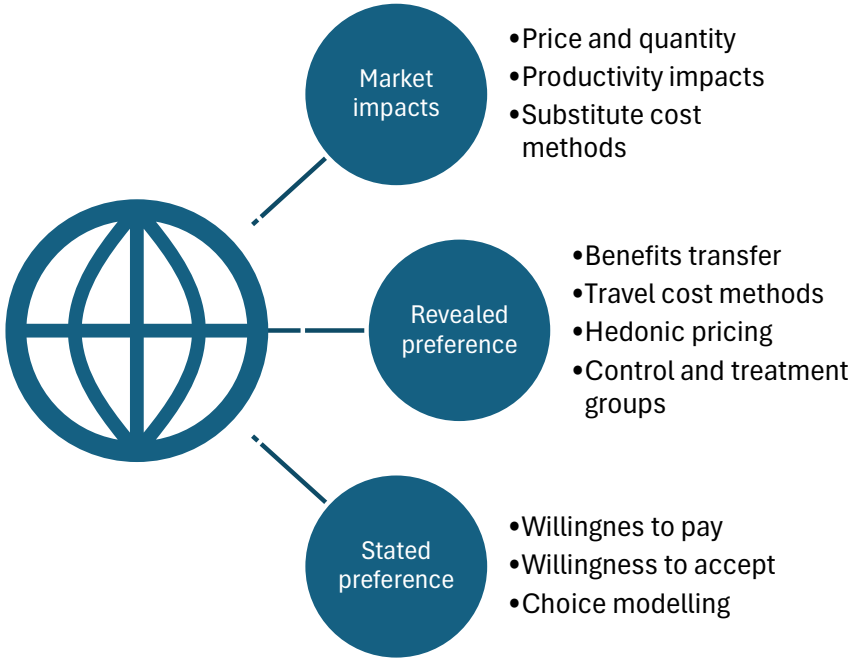
Year number					1	2	3	4	5	6	7	8	9	10
		PV	PV	PV										
		3%	7%	10%	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
		US$												
Benefits (net of user costs)	US$m	104,787,221	74,229,013	58,341,106	65,000	2,025,000	1,525,000	515,000	2,415,000	7,565,000	10,465,000	12,465,000	14,465,000	14,465,000
Costs	US$m	29,172,694	25,344,825	23,128,630	1,150,000	7,670,000	6,270,000	4,250,000	4,150,000	750,000	750,000	750,000	750,000	750,000
Net cash flow					- 1,085,000	- 5,645,000	- 4,745,000	- 3,735,000	- 1,735,000	6,815,000	9,715,000	11,715,000	13,715,000	13,715,000
Net present value	**US$m**	**75,614,527**	**48,884,188**	**35,212,475**										
Benefit cost ratio		**3.59**	**2.93**	**2.52**										

Estimating value



- Use and non-use values
- Direct use values tend to be the easiest to quantify – quantity and price
- However, there are economic techniques for estimating ecological and option values such as environment and protection from natural disasters
- Many of the beneficial impacts in SIDS are in the latter category

Market and non-market methods



- Conducting a CBA can require time and can be expensive
- Potential to take advantage of studies already done and use a benefits transfer technique to reduce costs analysis
- Still need a robust analysis to satisfy finance agencies and donors.
- CBA considers the direct socio-economic impact impacts
- Other techniques can look at the indirect (economy wide) impacts if needed

Challenges

Finding a path through the maze of financial sources	•Identify the relevant financial institutions •Document the relevant programs •Document the terms and conditions of financing
Articulating the value of investment in geospatial policies, processes and infrastructure	•Build the business cases •Get geospatial capability more mainstream •Draw on the UN-IGIF frameworks
Demonstrate to socio-economic case for investment	•Geospatial services role in meeting sustainable development goals •Document existing case studies
Build capacity and capability in conducting socio economic assessments	• Online training programs for officials •Greater use of benefits transfer techniques from existing studies • Consider joint assessments

Thank you

- The author would like to acknowledge the work of the Sustainable Funding Working Group and in particular the General Authority for Survey and Geospatial Information (GEOSA) of the Kingdom of Saudi Arabia for their support in developing the Funding Guide.

- Views and opinion expressed in this presentation are those of the author.

The most relevant SDGs related to the presentation and theme of this session

1st relevant SDG

2nd relevant SDG

3rd relevant SDG

SUSTAINABLE DEVELOPMENT GOALS

International Federation of Surveyors supports the Sustainable Development Goals

Geospatial information services fundamental to sustainable development goals

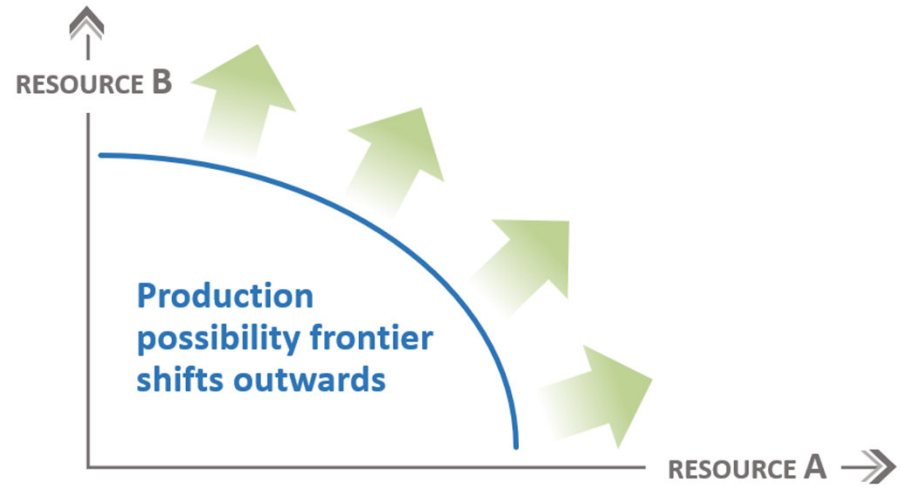
- There are clear benefits for developing countries from investment in the UN-IGIF.
- The challenge is mobilizing the funding and resources needed.
- Most funding sources need to see the business case for investment and the socio-economic justification for doing so.

Estimating wider impacts

CBA measures the direct impacts of an investment or policy change

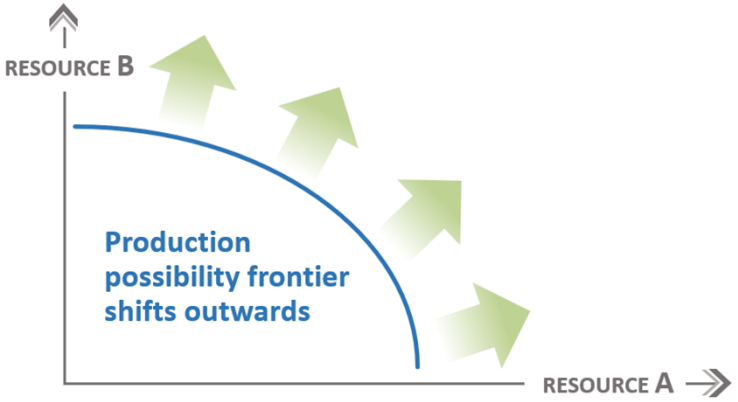
Such impacts generally have impacts on the wider economy
- referred to as indirect effects

Other models can calculate these wider impacts
- computer general equilibrium (CGE) modelling
- Input output multipliers

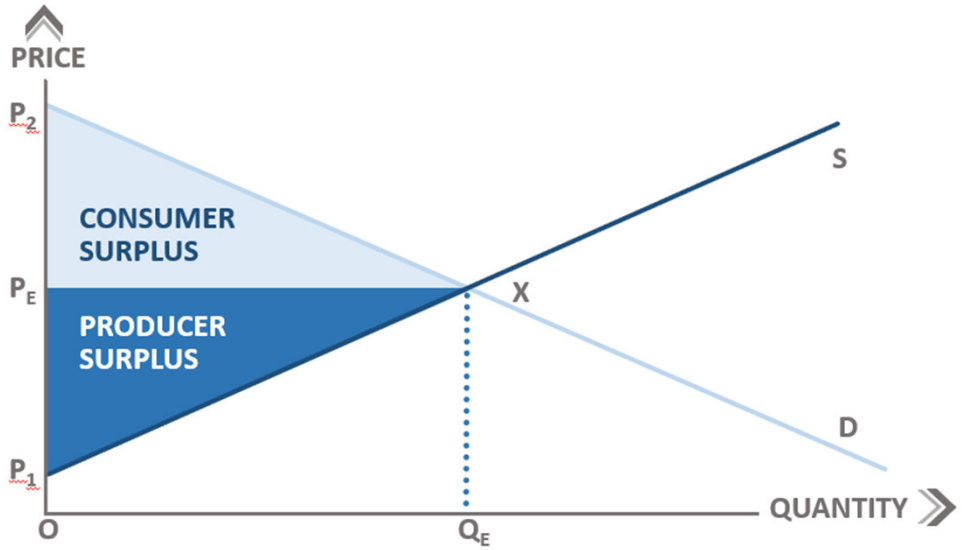


Indirect (economy wide) benefits and costs

Estimating the productivity impacts on the economy



Estimating consumer and producer surplus



STEP 1: SELECT HERE THE THREE MOST RELEVANT SDGs
STEP 2: COPY THE SDG INTO PREVIOUS SLIDE